TEXAS ANTIQUITIES PERMIT 6069

ARCHEOLOGICAL SURVEYS IN RESPONSE TO THE BASTROP COUNTY COMPLEX FIRE, BASTROP STATE PARK, BASTROP COUNTY, TEXAS

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ARCHEOLOGICAL SURVEYS IN RESPONSE TO THE BASTROP COUNTY COMPLEX FIRE, BASTROP STATE PARK, BASTROP COUNTY, TEXAS

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ABSTRACT

The catastrophic Bastrop County Complex Fire burned 6,650 acres (99 percent) of Bastrop State Park between September 5 and 8, 2011. The vegetation on the ground surface in those areas ranged from scorched to heavily burned. Rains then washed away the charcoal and ash resulting in 30 percent to 100 percent ground visibility which offered a view of the park's archeology that had never been available since it opened in 1937.

In mid-October of 2011 Texas Parks & Wildlife Department (TPWD) recognized that the burned timber could be logged and sold, but it was rapidly drying out and becoming less marketable. TPWD archeologists were called out to survey six units where the burned timber was slated for sale, encompassing 1,296 acres. In consultation with the Texas Historical Commission, TPWD archeologists devised a strategy to rapidly identify archeological sites on the units based on surface evidence, and define and mark buffer zones around them to protect them from logging impacts. TPWD archeologists completed the survey between October 17 and October 24 under Texas Antiquities Permit 6069. While this project was initiated to ensure that the harvest of burned timber was conducted in compliance with the Antiquities Code of Texas (Subchapter A, Section 191.002), logging was only initiated in one timber harvest unit before the logging contractor determined that completing the timber harvest was economically unfeasible due to difficulties encountered during logging and the distance to east Texas sawmills. Removal of hazardous trees in the road corridors was completed.

In November of 2011 TPWD recognized that falling timber near park roads constituted a hazard to vehicles. TPWD archeologists surveyed an additional 200 m wide corridor along stretches of Park Roads 1A and 1C, Harmon Road, and Gotier Trace, totaling 10.8 miles and covering 303.5 acres. Texas Antiquities Permit 6069 was amended to include the additional acreage. The road corridors overlapped parts of the timber harvest units, and the combined surveys total 1,573.2 acres. The 11 sites discovered during the timber harvest unit and road corridor surveys were fully recorded in December 2011 and January 2012 as 41BP871-41BP881. A known but unrecorded site (41BP882) also was recorded due to its apparent high level of significance. Based on their research potential 10 of the 12 sites recorded during the investigation merit official designation as State Antiquities Landmarks and are recommended as eligible for listing on the National Register of Historic Places (41BP871, 41BP872, 41BP873, 41BP875, 41BP877, 41BP878, 41BP879, 41BP880, 41BP881, and 41BP882). Sites 41BP874 and 41BP876 are recommended as ineligible for listing on the National Register of Historic Places.

The report includes a plan for management and protection of these 12 archeological sites in Bastrop State Park. The artifacts and records from these investigations are curated at the TPWD Archeology Laboratory in Austin.

ACKNOWLEDGEMENTS

A number of individuals supported and contributed to the investigations documented in this report. TPWD Cultural Resources Program Director Michael Strutt provided continuing support, and former TPWD Region 3 Cultural Resources Coordinator Diane Dismukes advised on and directed part of the fieldwork. TPWD Region 6 Cultural Resources Coordinator Rich Mahoney shared his knowledge of the archeology of Bastrop State Park. The staff of the Bastrop State Park Complex, including Complex Manager Todd McClanahan, Bastrop State Park Superintendent Roger Dolle, and Buescher State Park Superintendent Cullen Sartor, provided critical logistical support to the field crews during a very busy time.

Many thanks go to Luis Alvarado, who served as Project Archeologist for the field investigations in 2011; this project could not have been completed without his capable field direction and cool head under challenging conditions. Other TPWD archeologists who worked on the surveys were Logan McNatt, Toni Fischer, Marni Francell, Aina Dodge, Rich Mahoney, Margaret Howard, Joshua Gibbs, Ruth Mathews, Kent Hicks, Diane Dismukes, and Stephen Garrett. Working unflaggingly during long field days under conditions ranging from hot to bitter cold, they contributed substantially to the quality of the data on which this report is based.

During the analysis phase of investigations, former TPWD Cultural Resources Coordinator Art Black provided substantial assistance in identifying the historic artifacts. TPWD Archeology Laboratory Director Aina Dodge provided ancestry research for the history of the Yewpon community. Report production benefited considerably from the Geographic Information Systems figures produced by Joshua Gibbs in TPWD Archeological Services. Marni Francell and Joshua Gibbs coordinated the analysis and presentation of artifact data from multiple field phases. Benjamin Bury and Robin Benson Barnes coordinated the final edits and report production. The TPWD Creative and Interactive Services team designed the cover and coordinated the printing. The support of all of these individuals is greatly appreciated.

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1. INTRODUCTION AND MANAGEMENT SUMMARY

by Margaret Howard and John Lowe

The catastrophic Bastrop County Complex Fire burned 6,650 acres (99 percent) of Bastrop State Park between September 5 and 8, 2011 (Lost Pines Recovery Team 2011:1). On September 29, Texas Parks & Wildlife Department (TPWD) archeologists conducted a one-day survey of 10 firebreaks that had been bulldozed to protect historic structures and park facilities, which is reported under separate cover (McNatt 2012).

In October and November of 2011, TPWD archeologists were called out to survey 1,573.2 acres in the park, consisting of six proposed timber harvest units and four corridors along park roads where hazardous trees needed to be removed (Figure 1). The archeologists were notified of the immediate need for a survey of timber harvest areas on October 15, 2011, when it was recognized that the burned timber could be logged and sold but was rapidly drying out and becoming less marketable (Lost Pines Recovery Team 2011:216-217). TPWD anticipated that logging on five timber harvest units would begin on October 18.

In consultation with the Texas Historical Commission (THC), TPWD archeologists devised a strategy to rapidly identify archeological sites on the harvest units, protect them, and allow logging to proceed. Because the wildfire had consumed most or all of the layer of dead plant material that typically covered the ground and recent rains had washed the charcoal and ash away, ground surface visibility on the units ranged from 30 percent up to 100 percent, offering a view of the park's archeology that had never been available during any previous investigation. Taking advantage of this, archeological sites would be defined based on the surface evidence of their extent. Buffer zones ranging from 50 to 100 feet (depending on the terrain) would be delineated around each site and marked on trees with spray paint. A TPWD timber manager would be on site during the logging operations to ensure that all of the archeological sites were avoided.

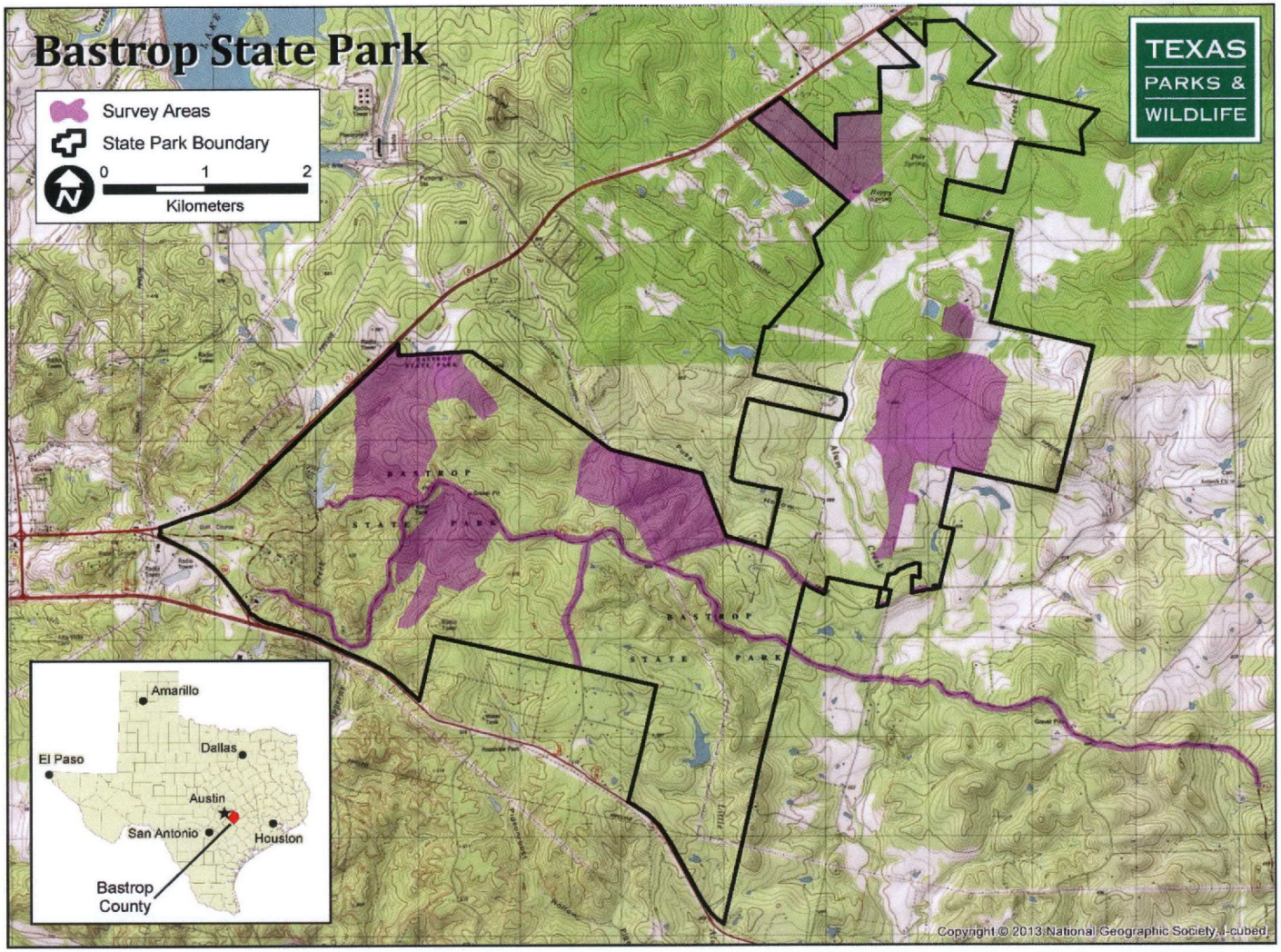

Figure 1-1. Areas surveyed in 2011, Bastrop State Park.

These conditions were included in the research design for Antiquities Permit 6069, which was issued on October 17, 2011; by granting that permit, THC authorized the proposed logging project to proceed. Margaret Howard was the Principal Investigator for the permit, and Luis Alvarado served as Project Archeologist. A crew of nine TPWD archeologists and a THC archeologist started work the day that the permit was issued, in order to stay ahead of the anticipated logging operation. Working 9 to 11 hour days, the large crew surveyed the five timber harvest units in the order that they were to be logged. A sixth timber harvest unit was added to the logging project on October 20, verbally authorized in the field by THC archeologist Mark Denton, and surveyed that day. Overall, 1,296 acres slated for timber harvest were surveyed on October 17-22 and 24, 2011 (see Figure 1).

Due to the distance to major sawmills in east Texas, the logging contract proved to be more difficult to award than had been anticipated. Logging was initiated on one timber harvest unit in November 2011, but ended when the contractor defaulted. Further timber harvest was no longer economically feasible by that time (Lost Pines Recovery Team 2011:217).

A second survey was undertaken in November of 2011 when it became apparent that falling timber near park roads constituted a hazard to vehicles. The 200 ft wide survey corridor was centered on 10.8 miles of Park Roads 1A and 1C, Harmon Road, and Gotier Trace, and covered a total of 303.5 acres (see Figure 1). At the request of Cultural Resources Program Director Michael Strutt, THC approved inclusion of the road corridor survey in the investigations authorized under Antiquities Permit 6069 by means of an email sent on November 3, 2011. Diane Dismukes, Margaret Howard, and Logan McNatt served as Project Archeologists for the road corridor survey, which was conducted on November 3-5 and 7, 2011 by two crews of four TPWD archeologists.

On December 12, 14, and 15 of 2011 and January 11 and 12 of 2012, TPWD archeologists fully recorded the 11 sites that had been discovered in the timber harvest units and road corridors (41BP871-41BP881), and updated the records on previously recorded site 41BP428, part of which fell within the road corridor. Three other archeological sites that were wholly or partially within timber harvest units (41BP823, 41BP831, and 41BP834) had been fully recorded in 2007, and their records were not updated. A known but unrecorded site outside of the survey areas also was recorded due to its apparent high level of significance (41BP882). Shovel testing was conducted on the 12 sites that were recorded to ascertain the content and density of their subsurface cultural deposits. Site buffer zone marks on trees were painted over after the sites were recorded. Margaret Howard directed this phase of the investigations, which was carried out by a crew of five to eight TPWD archeologists.

Hazardous timber within the surveyed road corridors was logged in December 2011 and January 2012. Several measures were taken to minimize impacts to the six sites that were partially within the road corridor (41BP428 and 41BP877-41BP881). Removal of hazardous trees inside site buffer zones was limited to areas within 15 feet of paved roads. Trees were cut with a tree shear or feller-buncher positioned on the road, and then lifted and transported to locations outside

of archeological sites, without touching the ground surface. Site 41BP428 required special treatment because it is bisected by a road, adjoins a creek, and had many large dead trees. Only the largest trees leaning toward the road were removed. Tree tops were chipped on-site and the ground was covered with wood chips to protect the cultural deposits. Log storage, processing, and loading operations were conducted within 25 feet of the road and on an existing paved area.

Structures built by the Civilian Conservation Corps (CCC) also are located within the road corridors, consisting of culverts, retaining walls, and guardwalls that are designated as contributing resources in the Bastrop State Park National Historic Landmark nomination (Newlan et al. 1997:8). To protect these significant CCC structures, TPWD Historic Preservation Specialist Doug Porter marked them with wooden stakes and flag tape, and machinery avoided those areas during tree removal. When there was no other option but to fell trees across CCC structures, cut logs were laid parallel to the walls and stacked high enough to support the impact of felled trees. TPWD Timber Manager Greg Creacy was on-site during the logging on site 41BP428 and near the CCC features, and ensured that these practices were followed.

TPWD later sought funding from the Federal Emergency Management Authority (FEMA) to cover the costs of removal of hazardous trees along the road corridors in Bastrop State Park. On behalf of FEMA, an interim report on the timber harvest unit survey and road corridor survey (Howard 2012) and maps containing restricted cultural resources information were provided to the Texas Historical Commission in March of 2012. FEMA subsequently provided partial reimbursement to TPWD for the cost of hazardous tree removal near roads in the park.

Although the 2011 surveys of timber harvest units and road corridors were conducted under emergency conditions, they have produced unique and valuable data on the archeology of Bastrop State Park. In 2017 additional shovel testing was conducted at selected sites in order to assist in the final determination of site boundaries as well as obtain more information regarding the integrity of the buried deposits to assist in setting management priorities for these sites. The goals of these archeological investigations and this report are to (1) inventory and evaluate the archeological sites in the survey areas, (2) recommend priorities for management of these sites, and (3) recommendations for future archeological investigations in the park.

This report begins with a summary of findings, and the rest of the report provides detailed information to support those findings. This Introduction and Management Summary outlines the history of human occupation in the park, identifies the locations of the sites recorded during the investigation, and lists the 12 archeological sites, along with instructions for taking care of them. In the main body of the report, the Environmental Background describes the park landscape and natural resources. The Prehistoric Background, Historic Background, and Previous Investigations relates the history of Native American cultures in Bastrop County, a summary of the history of the park, summarizes previous archeological work in the park, and reviews the context and integrity of archeological sites encompassed in the sandy mantle that covers almost all of the county. The next section describes the Methods of Archeological Investigations. The Site Descriptions section

provides detailed information on the 12 newly recorded sites. Materials Recovered describes the items that were collected, and explains how their ages and purposes were identified. The final section is the Management Plan for Archeological Resources, which explains how to comply with state laws and agency policies for archeological site protection, describes the activities that can damage archeological sites, and provides management priorities for the 12 sites and instructions for taking care of them. That section ends with recommendations for future archeological investigations. Following a list of References Cited, a Glossary of archeological terms is provided in the final pages of the report.

9,000 YEARS OF OCCUPATION IN BASTROP STATE PARK

Bastrop State Park is in the Bastrop Lost Pines ecoregion and Texan biotic province. This relict loblolly pine and hardwood upland forest was cut off from the east Texas pine belt well before humans arrived in the Americas. It is a unique setting, distinct from the Gulf Coastal Plain to the south and east, the Blackland Prairie to the north and immediate west, and the Edwards Plateau and Balcones Escarpment further west. Bastrop State Park has a high diversity of animals; there are at least 49 native species of mammals, 57 species of reptiles, and 23 species of amphibians, as well as numerous birds. Among these are white-tailed deer, rabbits, turkeys, turtles, and snakes. Bison probably were not present in the park in prehistoric times, but they would have roamed across the grasslands on the plains and prairies that surround the Lost Pines region. Aquatic resources would have included fish from the Colorado River and large creeks, as well as freshwater mussels. Floral resources include nuts from oak and hickory trees, mesquite seeds, sunflower seeds, and the inner bark of elm trees.

Prehistoric people were probably also drawn to the land that is now in Bastrop State Park because high-quality material for making chipped stone tools could be obtained from gravel deposits on many hilltops. Several sites in the park are associated with gravel deposits, and prehistoric people clearly were chipping those stones to make tools. The west part of the park has high quality chert gravels from the Edwards Plateau, deposited by the Colorado River. Elsewhere in the park, some upland ridges and hilltops are capped by deposits of chert, quartz, jasper, quartzite, limestone, and petrified wood gravels. Quartzite cobbles and sandstone slabs used for grinding stones could have been obtained from several hillsides in the park.

The 12,000-year history of human occupations in Central Texas is divided into periods based on major changes in lifestyles. Collins (2004:116-124) proposes a Central Texas cultural chronology that begins with the Paleoindian period from 11,200 to 8800 years ago (9250 to 6850 B.C.), the Early Archaic from ca. 8800 to 6000 years ago (6850 to 4050 B. C.), the Middle Archaic from ca. 6000 to 4000 years ago (4050 to 2050 B.C.), the Late Archaic from ca. 4000 to 1300 years ago (2050 B.C. to A.D. 750), and the Late Prehistoric from ca. 1300 to 300 years ago (A.D. 750 to 1700).

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 early in the Paleoindian period (Bousman et al. 2004:75-84; Collins 2004:113). While people have been living in Texas for at least 12,000 years, the earliest evidence of prehistoric occupation at Bastrop State Park dates from 9,500 to 9,000 years ago. 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). Intensified use of local resources through the use of heated rock in hearths, ovens, and middens (Collins 2004:119) is a hallmark of the Archaic. The beginning of the Late Prehistoric period around 1300 years ago is marked by the introduction of bow and arrow technology, possibly from the north (Prewitt 1985:228). Ceramics – both locally produced and from northeast Texas – appear late in the Central Texas prehistoric sequence and are not abundant. 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 during drought conditions (Prewitt 1981a:74).

Evidence from archeological investigations at Bastrop State Park shows that people have lived there for over 9,000 years. Most of the occupations were brief, leaving behind little debris or evidence that allows us to determine when people were there. Several occupations were more substantial, as indicated by fire-cracked rocks from campfires and stone tools representing a variety of activities that took place. Most of the recorded archeological sites are on the edge of ridges near prominent water features, including Copperas Creek, Alum Creek, and smaller springs, seeps, and ephemeral/intermittent streams. The Colorado River is 1.7 miles south-southwest of the park boundary at its nearest point and access to that river and the resources along it was surely a factor in the decision to camp at locations in the park.

The first settlers arrived in the vicinity of Bastrop State Park in the mid-nineteenth century, with the Gotier Trace opening in 1831 connecting Bastrop to the municipality of San Felipe. Shortly afterwards, a 100 year period of logging began and settlers started to build along Alum Creek. A post office was established in the community of Yewpon in 1902 but closed in 1918 as settlers left (see Appendix A). Recreational use of the area began with the development of a country club in the western part of the park in 1913 and continued with the damming of Copperas Creek for fishing and boating. The Texas State Parks Board began to acquire the land that is now in the park in 1933. By 1934, CCC Companies 1805 and 1811 were building park infrastructure which included a nine-hole golf course and swimming pool.

ARCHEOLOGICAL MANAGEMENT IN BASTROP STATE PARK

As state property, all construction and other ground-disturbing activities that could damage the archeological sites of Bastrop State Park are governed by the Antiquities Code of Texas, and regulated by the Texas Historical Commission. TPWD conducted these investigations to advance the purpose of the Antiquities Code: "It is the public policy and in the public interest of the State of Texas to locate, protect, and preserve all sites in, on, or under any of the land within the

jurisdiction of the State of Texas" (Antiquities Code of Texas, Subchapter A, Section 191.002). The management plan at the end of this report will help TPWD to comply with the Antiquities Code when conducting activities that could damage archeological sites, and will support the TPWD mission "To manage and conserve the natural and cultural resources of Texas for the use and enjoyment of present and future generations." In addition, the archeological sites recorded during this project are also evaluated in terms of their merit for inclusion in the National Register of Historic Places, a list of federally-recognized properties authorized by the National Historic Preservation Act of 1966 (54 U.S.C. 300101 et seq.) in the event compliance with federal antiquities codes is required for future projects that utilize federal funds.

Fifteen archeological sites are within the survey areas; 11 are newly recorded and four are previously recorded. The four previously recorded sites were not reassessed during this investigation (41BP428, 41BP823, 41BP831, and 41BP834). Sites 41BP428, 41BP834, 41BP871 41BP872, 41BP873, 41BP875, 41BP878, 41BP879, 41BP880, and 41BP881 (a total of 10 of the 12 evaluated sites) merit official designation as State Antiquities Landmarks because they have significant historic or prehistoric cultural deposits (Table 1). These 10 sites are also eligible for listing on the National Register of Historic Places due to their likelihood of yielding information important in prehistory or history. Of the 12 archeological sites recorded in Bastrop State Park during these investigations, 10 date solely to the prehistoric period, and two have both prehistoric and historic components.

Site 41BP882 also was recorded during the current investigations, although it is outside the harvest units and road corridors. It appears to be unique among the sites recorded in Bastrop State Park in terms of the number of time periods evidenced (Late Paleoindian through Late Prehistoric) and the diversity of chipped stone tools present. Site 41BP882 clearly merits official designation as a State Antiquities Landmark.

The priority for managing and protecting the archeological sites in Bastrop State Park has been ranked using a scale of 1 (highest priority) through 4 (lowest priority), based on their merit for official designation in conjunction with their susceptibility to vandalism (see Table 1 and Figure 1-2). Management Priority 2 is assigned to ten sites that merit official designation as State Antiquities Landmarks due to their research potential. Management Priority 4 is assigned to two sites that do not merit official designation as State Antiquities Landmarks. No sites are assigned to Management Priority 1 or Management Priority 3.

Archeological sites can be damaged by a variety of causes, depending on how close they are to park facilities, how visible they are to visitors, and other factors. The main causes of damage to the 12 archeological sites recorded in Bastrop State Park during this investigation are moderate to severe erosion (6 sites), bioturbation and rodent burrowing (7 sites), and wildfire (8 sites), while vandalism (1 site) is far less common. Based on these causes of damage, management practices are recommended for each site. The main method is monitoring of a site for damage at recommended intervals, depending on the importance of the site and the risk of damage.

Table 1-1. Archeological Site Management Priorities.

Site	Age	State Antiquities Landmark Status	National Register of Historic Places Status	Percent Intact	Management Priority	Current Causes of Damage	Management Practices
41BP871	Late Prehistoric	recommended for designation	recommended eligible	60%	2	logging, extensive rodent burrowing, wildfire	monitor yearly for erosion and bioturbation
41BP872	prehistoric, early 20th century	recommended for designation	recommended eligible	40-80%	2	clearing, plowing, rodent burrowing, wildfire	monitor yearly for erosion and bioturbation, limit access on road
41BP873	prehistoric, early 20th century	recommended for designation	recommended eligible	60%	2	clearing, rodent burrowing, erosion, wildfire	monitor yearly for erosion and bioturbation, limit access on road
41BP874	prehistoric	not recommended for designation	not recommended eligible	80%	4	Sheet erosion	none recommended
41BP875	prehistoric	recommended for designation	recommended eligible	60%	2	animal burrowing, wildfire	monitor yearly for erosion and bioturbation
41BP876	Archaic	not recommended for designation	not recommended eligible	70%	4	minor erosion	none recommended
41BP877	Late Archaic	recommended for designation	recommended eligible	50%	2	rodent burrowing, erosion, wildfire	monitor 4 times per year for erosion and vandalism
41BP878	prehistoric	recommended for designation	recommended eligible	60%	2	road construction, wildfire	monitor yearly for erosion and bioturbation
41BP879	Late Paleoindian, Late Archaic, Late Prehistoric	recommended for designation	recommended eligible	50%	2	Uncontrolled excavations, road construction, modern dumping, wildfire	monitor 4 times per year for erosion and vandalism

Site	Age	State Antiquities Landmark Status	National Register of Historic Places Status	Percent Intact	Management Priority	Current Causes of Damage	Management Practices
41BP880	Late Prehistoric	recommended for designation	recommended eligible	70%	2	wildfire, erosion	monitor 4 times per year for erosion, particularly gullying
41BP881	Late Prehistoric	recommended for designation	recommended eligible	60%	2	wildfire, road construction, animal burrowing, erosion	monitor yearly for erosion
41BP882	Late Paleoindian, Early Archaic, Middle Archaic, Late Archaic, Late Prehistoric	recommended for designation	recommended eligible	60-70%	2	clearing, animal burrows, erosion, unimproved roads, minor scorching, collecting	monitor 4 times per year for erosion and vandalism

Detailed instructions on management practices are given in the Management Plan for Archeological Resources near the end of this report. The best source of information on archeological site protection is the TPWD Cultural Resources Coordinator for Bastrop State Park, who reviews all construction and maintenance projects that will damage the ground surface in state parks. The TPWD Cultural Resources Coordinator will consider the management priorities when deciding whether to require archeological studies before a construction project is approved to go forward under the Antiquities Code of Texas. The use of management priorities during the planning phase of construction projects can minimize costs and delays. The Management Plan for Archeological Resources at the end of the report describes the project review and approval process.

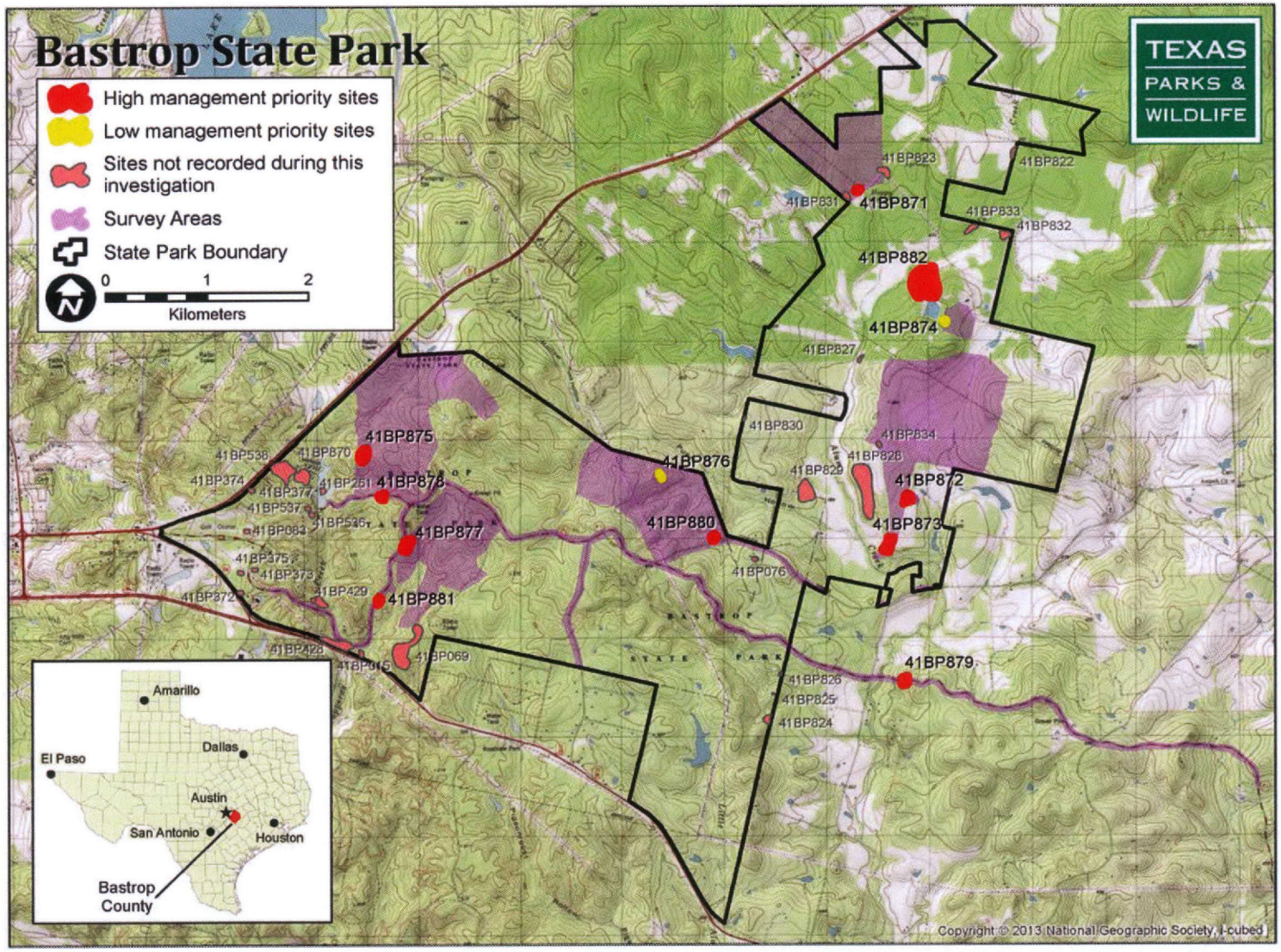

Figure 1-2. Zones of archeological sensitivity.

2. ENVIRONMENTAL BACKGROUND

by John Lowe

The unique environmental setting of Bastrop State Park provided opportunities and limitations for use of the natural resources by prehistoric and historic inhabitants, and is an important factor in interpreting sites in the survey areas. It also reflects human activities over the past 180 years that have altered the landscape. This section describes the physiography, geology, hydrology, soils, climate and paleoenvironment, flora, and fauna of the park, and the changes caused by historic land use.

PHYSIOGRAPHY

Bastrop State Park is located in central Texas on the edges of two major physiographic regions: the Gulf Coastal Plain to the south and east, and the Edwards Plateau to the west. More specifically, the park is on the west edge of the Interior Coastal Plain sub-region, with the Blackland Prairie sub-region on the west (Bureau of Economic Geology 1996).

The park encompasses upland landforms overlooking the Colorado River valley. The terrain within the park is rolling, with slopes ranging from gentle to steep, and includes some broad upland plains. The area is shallowly dissected by Copperas Creek on the west and Alum Creek and its tributaries on the east. Elevations in the park range from 616 ft above mean sea level on the northwest to 320 ft on the Alum Creek floodplain.

GEOLOGY

The surface geology of Bastrop State Park consists primarily of Tertiary Period formations that date to the Eocene Epoch (Barnes 1974). From west to east, they are the Carrizo Sand, Reklaw Formation, and Queen City Sand, with the Reklaw Formation underlying 70 percent of the park. The Carrizo Sand formation consists of sandstone that is fine to coarse-grained, poorly sorted, friable, non-calcareous, and thickly bedded (Barnes 1974:5); it underlies 17 percent of the park. The Reklaw Formation consists of sand and clay; the upper part is carbonaceous silty clay with lentils of glauconitic clay ironstone, while the lower part is quartz sand and clay with some clay ironstone ledges and rubble (Barnes 1974:4). The Queen City Sand formation consists of fine-grained quartz sand with thin interbeds of sandy and silty glauconitic clay (Barnes 1974:4); it underlies 9 percent of the park.

A small area of level ground at the far west end of the park is mapped as Pleistocene age Quaternary high gravel deposits, and comprises 4 percent of the park. It is a terrace of the ancestral Colorado River; within the park, these gravels are commonly exposed on the surface. The gravels in the Colorado River terraces include dolomite, limestone, and chert from the Edwards Plateau (Barnes 1974:1).

Chert resources in the park occur in two settings. The high gravel deposits in the west part of the park contain chert gravels from the Edwards Plateau, deposited by the Colorado River. The Edwards Plateau is one of the largest sources of chert in the United States, with a number of formations bearing varying amounts and qualities of chert (Banks 1990:59). The Colorado River flows through an area of the plateau that is considered to have the highest quality Edwards chert, which occurs in the vicinity of Austin and extends north to Georgetown (Banks 1990:60).

Chert also can be obtained from numerous exposed gravel deposits on upland ridges and hilltops in the park. These Uvalde Gravels are lag deposits of waterworn siliceous gravels not found in situ in central and south Texas, and consist of chert, quartz, jasper, quartzite, limestone, and petrified wood in sizes ranging from pebbles to boulders (Byrd 1971:5-6). Banks (1990:56) notes that the term Uvalde Gravel is applied to almost all relict gravel deposits on late Tertiary and Pleistocene terraces. The Uvalde Gravels in the park are the likely source of raw material for the quartzite cobbles used as grinding stones, while sandstone for use as grinding slabs could have been obtained from Carrizo Sand outcrops.

HYDROLOGY

Natural water sources in the park include two perennial spring-fed surface streams, three additional named streams, two named springs, and numerous smaller springs, seeps, and ephemeral/intermittent streams. The Colorado River flows west and south of the park, and at its closest is approximately 1.7 miles south-southwest of the south park boundary along State Highway 71 (see Figure 1-1).

Copperas Creek is the major drainage in the western part of the park, with headwaters just north of State Highway 21. It flows south across the park towards the Colorado River in a narrow basin with relatively steep topography.

Alum Creek and its tributaries drain the eastern part of the park. The creek begins 5.2 miles north of the park as a perennial stream, and receives additional flow from Holly Spring and Pole Spring, both in the northeast part of the park. In addition to numerous unnamed ephemeral tributaries, Puss Hollow, Pidgeonroost Hollow, and Little Alum Creek drain the central part of the park and Park Road 1C. TPWD archeologist Rich Mahoney identified an abandoned channel of Alum Creek in a backhoe trench dug in 2010 (Richard B. Mahoney, personal communication 2012). In contrast to the Copperas Creek drainage basin, Alum Creek has a broad basin with rolling topography.

SOILS

The soils in Bastrop State Park are primarily sandy alfisols of the Patilo-Demona-Silstid association: gently sloping to strongly sloping soils with sandy surface layers, formed from weathering and erosion of the underlying bedrock (Baker 1979:2-3, 69). Broadly speaking, the Patilo soils are found on ridgetops and side slopes, Demona soils are on foot slopes and

drainageways and occasionally ridgetops, and Silstid soils are on foot slopes and drainageways (Baker 1979:2). Most of the soils in this association are deep, well drained to moderately well drained, neutral to slightly acid sands and fine sandy loams.

Sixteen soil series are mapped in the survey areas (Figure 2-1; Table 2-1). Seven of them comprise 93 percent of the total acreage, and only these most prominent soil types are described here. The remaining nine map units cover very small parts of the survey areas, with most comprising less than one percent of the total acreage.

The Patilo complex, with 1 to 12 percent slopes (PaE), covers 39 percent of the survey area, concentrated in the western and northern timber harvest units (see Figure 2-1). Patilo soils are deep, moderately well drained sandy soils found on uplands; depths to sandy clay loam subsoil typically range from 50 to 70 inches (127 to 178 cm) below surface. The Patilo complex map unit includes soils with thick, billowy sandy surface layers more than 30 inches (76 cm) thick, overlying mottled red, yellow, brown, and gray sandy clay loam. These soils are commonly found where slopes are greater than 8 percent (Baker 1979:22).

The Axtell-Tabor complex, with 1 to 8 percent slopes (AtD), comprises 15.6 percent of the survey areas, primarily in the southern timber harvest units and the road corridors (see Figure 2-1). This complex is found on gently sloping to sloping side slopes and in drainageways, and consists of 70 percent Axtell soils, 20 percent Tabor soils, and 10 percent other soils. Axtell and Tabor soils are relatively shallow gravelly sandy loam to fine sandy loam and typically are 14 to 18 inches (35 to 45 cm) thick, overlying red or brownish-yellow mottled clay (Baker 1979:8).

Jedd stony soils, with 5 to 20 percent slopes (JeF), cover 10.9 percent of the survey areas; they primarily occur in the western timber harvest units, and cover almost all of Timber Harvest Unit 6 on the east. These soils are found on small, sloping ridgetops and short, hilly side slopes. The surface layer typically is 4 inches (10 cm) thick and consists of gravelly sandy loam to gravelly loamy sand, with 30 to 70 percent small siliceous pebbles and up to 35 percent platy sandstone cobbles. Below this is gravelly sandy loam to 12 inches (30 cm) below surface, overlying a red clay substrate. Sandstone outcrops comprise a small percentage of the mapped areas (Baker 1979:18-19).

Silstid loamy fine sand, with 1 to 5 percent slopes (SkC), comprises 9.6 percent of the survey areas, primarily in bands across the southern timber harvest units and road corridors, but also in small parts of all of the harvest units. This deep, well-drained sandy soil is found on gently sloping uplands. The upper 10 inches (25 cm) typically is loose, loamy fine sand; below that is loamy fine sand from 10 to 28 inches (25 to 71 cm), underlain by sandy clay loam from 28 to 40 inches (71 to 101 cm), becoming mottled with depth. Below 40 inches (102 cm) is a mottled clay loam (Baker 1979:25).

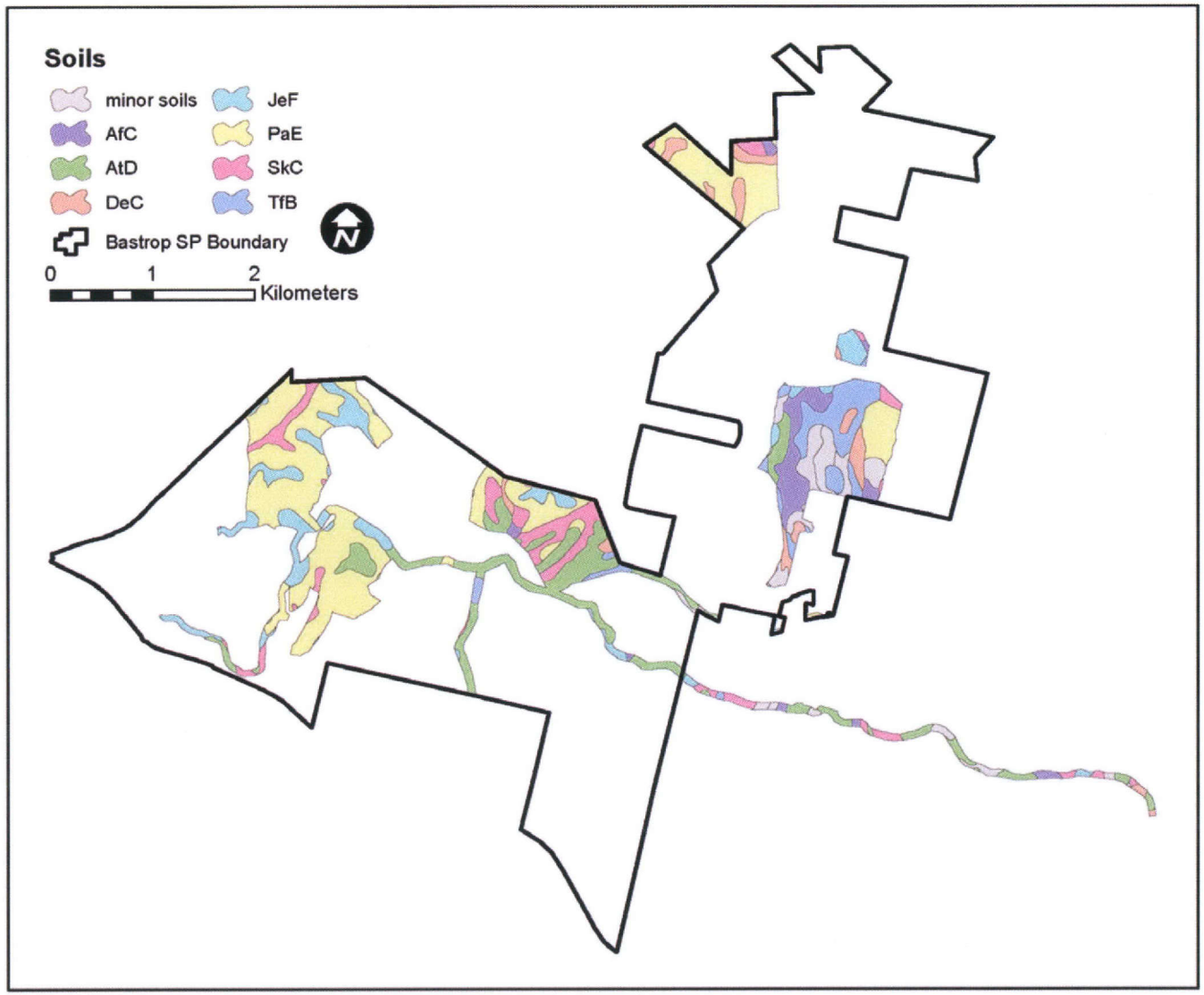

Figure 2-1. Soil map units in the survey areas.

Table 2-1. Soil Map Units and Acreage.

Soil Mapping Unit (Symbol)	Acres	Percent of Survey Areas
Patillo complex, 1-12 percent slopes (PaE)	613.7	39.0%
Axtell-Tabor complex, 1-8 percent slopes (AtD)	245.6	15.6%
Jedd stony soils, 5-20 percent slopes (JeF)	171.7	10.9%
Silstid loamy fine sand, 1-5 percent slopes (SkC)	150.8	9.6%
Tabor fine sandy loam, 1-3 percent slopes (TfB)	116.6	7.4%
Axtell fine sandy loam, 1-5 percent slopes (AfC)	88.4	5.6%
Demona loamy fine sand, 1-5 percent slopes (DeC)	79.1	5.0%
Crockett fine sandy loam, 1-3 percent slopes (CfB)	20.9	1.3%
Mabank loam, 1-3 percent slopes (MaB)	20.6	1.3%
Axtell fine sandy loam, 5-12 percent slopes, eroded (AfE2)	16.8	1.1%
Mabank loam, 0-1 percent slopes (MaA)	13.6	0.9%
Rosanky fine sandy loam, 3-8 percent slopes (RoD)	12.5	0.8%
Vernia complex, 1-8 percent slopes (VeD)	11.5	0.7%
Crockett soils, 5-10 percent slopes, eroded (CsE2)	7.1	0.4%
Sayers fine sandy loam (Sa)	3.8	0.2%
Dougherty loamy fine sand, 0-3 percent slopes (DoB)	0.3	<0.1%

Tabor fine sandy loam, with 1 to 3 percent slopes (TfB), covers 7.4 percent of the survey areas, primarily in the large, easternmost Harvest Unit 2. This deep, moderately well-drained, gently sloping loamy soil is found on ridgetops, foot slopes, and in drainageways. The surface layer is fine sandy loam with few small quartz pebbles, and typically is 6 inches (15 cm) thick. Below it is a lighter colored fine sandy loam with few small quartz pebbles and small concretions extending from 6 to 15 inches (15 to 38 cm) below surface. Underlying that is a clay substrate (Baker 1979:26-27).

Axtell fine sandy loam, with 1 to 5 percent slopes (AfC), comprises 5.6 percent of the survey areas, primarily in one large band across the easternmost timber harvest unit. This deep, well-drained to moderately well-drained soil is found on ridgetops and side slopes; the erosion hazard is moderate, and some areas have a few gullies. The surface layer is fine sandy loam that typically extends to 5 inches (13 cm) below surface, underlain by a lighter-colored fine sandy loam that extends from 5 to 8 inches (13 to 20 cm) below surface. Below it is an extremely firm, mottled clay substrate (Baker 1979:6-8).

Demona fine sandy loam, with 1 to 5 percent slopes (DeC), covers 5 percent of the survey areas, predominantly as bands in the northern and eastern timber harvest units. This deep, moderately well-drained sandy soil is on ridgetops and side slopes and in drainageways. The typical profile of this soil has a surface layer of loamy fine sand extending to 5 inches (13 cm)

below surface, overlying a thick layer of fine sandy loam extending from 5 to 28 inches (13 to 71 cm) below surface. Below it is a red sandy clay substrate (Baker 1979:14).

The soils in Bastrop State Park are typical of those found in the sandy mantle that occurs in a broad arc across the Texas Gulf Coastal Plain, extending from southwest to northeast; it overlies Tertiary and Quaternary formations consisting of weakly consolidated sedimentary rocks comprised primarily of cross-bedded quartz sand (Ahr et al. 2013:212). Sandy mantle soils have A and E horizons that appear to be largely weathered from the underlying sandstone (Ahr et al. 2013:224), although in some cases aggradation may also have resulted from eolian deposition or colluvial processes, perhaps related to episodic droughts (Ahr et al. 2013:220). The onset of the genesis of these soils is believed to greatly predate the migration of humans into North America, so buried cultural materials in the sandy mantle apparently settled down through the soil profile due to bioturbation and gravity (Ahr et al. 2013:223). These materials sometimes appear in correct chronological order (Ahr et al. 2013:212, 223), indicating that it is possible for archeological sites in the sandy mantle to retain some degree of horizontal and vertical integrity, although mixing is more intense in the upper sandy horizons (Ahr et al. 2013:222). Frederick and Bateman (2001) suggest that there is no single model of landform formation within the sandy mantle, due to the high degree of variability in ancient and modern gullies and preserved fragments of buried soils.

CLIMATE AND PALEOENVIRONMENT

The humid subtropical climate of Bastrop County is characterized by mild winters and hot summers. The average daily high temperature in January is 62.6 degrees, and the average daily high in August is 97.8 degrees (all temperatures are Fahrenheit). The warm season (freeze-free period) is 268 days long. Average annual precipitation is 37.2 inches, with peaks in June and September resulting from thundershowers (Baker 1979:70).

For Bastrop State Park, the closest paleoenvironmental record comes from pollen recovered in bog deposits (Bryant and Holloway 1985). These include Boriack Bog (Bryant 1977:145; Holloway and Bryant 1984) and Patschke Bog (Potzger and Tharp 1943, 1947, 1954; Patrick 1946) in Lee County to the northeast, and Soefje Peat Bog (Graham and Heimsch 1960), South Soefje Bog (Bryant 1969, 1977), and Hershop Bog (Larson et al. 1972) in Gonzales County to the south. Full-glacial age (22,500 to 14,000 years ago) fossil pollen samples from Boriack Bog include pine pollen; modern pollen studies demonstrate that most or all of it probably blew in from the Lost Pines, which are 30 miles south of the bog (Bryant 1977:153). In general, during the full-glacial period central Texas was considerably cooler and more humid than today, and was covered by grasslands, woodlands, and parklands (Bryant and Holloway 1985:50).

From 14,000 to 10,000 years ago, deciduous woodlands in central Texas gave way to grasslands and oak savannas (Bryant and Holloway 1985:51). This reflects a steady warming and/or drying trend that led to losses of major forested areas (Bryant and Holloway 1985:52). Pollen from Boriack Bog does not show as dramatic a reduction in arboreal pollens as other parts

of central Texas, but does display reduced diversity of taxa (Bryant 1977:152). Data from Hershop Bog in Gonzales County suggest that south central Texas climates were probably wetter and cooler than the modern climate (Bryant and Holloway 1985:53). Notable taxa that disappeared from the central Texas pollen record by the end of the late-glacial period include birch (*Betula nigra*), which favors mesic settings, and spruce (*Picea glauca*), which favors cooler climates (Bryant and Holloway 1985:53).

The post-glacial period began 10,000 years ago and extends to the present. The climatic changes that have occurred are subtle. In central Texas, the post-glacial period saw the decline of deciduous forests and woodlands and the gradual emergence of prairies and post oak savannas (Bryant and Holloway 1985:56). These changes reflect a gradual warming and drying trend (Bryant and Holloway 1985:61). Pollen recovered from peat deposits in several bogs show declines in tree pollen, except oak (*Quercus* spp.), along with an increase in herbaceous and grass pollen (Bryant and Holloway 1985:61). In south central Texas these changes occurred relatively quickly, as pollen records from Soefje Bog and Hershop Bog indicate that the present vegetation was established by 8,000 years ago and has remained remarkably stable since that time (Bryant and Holloway 1985:61). Pollen analyses from other parts of central Texas show a later establishment of the oak savanna between 3,000 and 1,500 years ago, and greater fluctuations in the post-glacial period (Bryant and Holloway 1985:62-64).

VEGETATION

Bastrop County is on the western boundary of the Post Oak Savanna ecological area (McMahan et al. 1984:3). Common trees include post oak (*Quercus stellata*), blackjack oak (*Q. marilandica*), live oak (*Q. virginiana*), sandjack oak (*Q. incana*), cedar elm (*Ulmus crassifolia*), eastern redcedar (*Juniperus virginiana*), mesquite (*Prosopis glandulosa*), black hickory (*Carya texana*), hackberry (*Celtis* spp.), and yaupon (*Ilex vomitoria*) (McMahan et al. 1984:19). Shrubs, forbs and grasses include American beautyberry (*Callicarpa americana*), hawthorn (*Crataegus* spp.), trumpet creeper (*Campsis radicans*), dewberry (*Rubus* spp.), little bluestem (*Schizachyrium scoparium* var. *frequens*), silver bluestem (*Bothriochloa saccharoides*), sand lovegrass (*Eragrostis trichodes*), beaked panicum (*Panicum anceps*), and tickclover (*Desmodium spp.*) (McMahan et al. 1984:19).

Within the post oak savanna, Bastrop State Park and vicinity is in the Bastrop Lost Pines ecoregion, an outlier of loblolly pine (*Pinus taeda*) and hardwood upland forest. It is the westernmost occurrence of southern pine in the United States, and lies 100 miles west of the Texas pine belt. The pines are thought to be a relict population predating the last glacial period (Griffith et al. 2007:71). The loblolly pines in the Lost Pines ecoregion have adapted to the drier climate of central Texas and have a thicker waxy coating on their needles, more fibrous root systems, shorter height, and more persistent trunk branches (Lost Pines Recovery Team 2011:214).

In addition to loblolly pine and post oak, the Loblolly Pine-Post Oak subtype of the Pine-Hardwood Forest **includes** black hickory, blackjack oak, eastern redcedar, cedar elm, hackberry, greenbriar (*Smilax spp.*), yaupon, elbowbush (*Forestiera pubescens*), purpletop (*Tridens flavus*), sand lovegrass, broomsedge bluestem (*Andropogon virginicus*), little bluestem, brownseed paspalum (*Paspalum plicatulum*), bushclover (*Lespedeza spp.*), tick clover (*Desmodium sp.*), gay feather (*Liatris* spp.), yellow neptunia (*Neptunia lutea*), bitter sneezeweed (*Helenium amarum*), and velvet bundleflower (*Desmanthus velutinus*) (McMahan et al. 1984:26).

In a 2012 survey, 698 plant taxa were identified in Bastrop State Park (Carr 2013:3, Appendix 2). The most common are the Grass Family (*Poaceae*) with 115 taxa, the Sunflower Family (*Asteraceae*) with 100 taxa, the Sedge Family *(Cyperaceae)* with 55 taxa, the Legume Family *(Fabaceae)* with 54 taxa, and the Spurge Family *(Euphorbiaceae)* with 28 taxa (Carr 2013:3). Two globally rare plant species were identified in the park: sanguin coneflower *(Echinacea sanguinea)* and green beebalm *(Monarda viridissima)* (Carr 2013:4-5).

Several of the plants in the park could have been utilized for prehistoric subsistence and medicinal purposes. They include nuts from oak and hickory trees, mesquite seeds, sunflower seeds, the inner bark of elm trees, and greenbriar roots (Thoms 2004:27). Additional plant foods could have been obtained in the Post Oak Savanna outside of the Lost Pines, including numerous root foods and seeds from several succulents (Thoms 2004:27).

The vegetation across almost all of Bastrop State Park was radically altered in 2011 by the Bastrop County Complex Fire. Over 32 percent of the park was heavily burned, almost 20 percent was moderately burned, 29 percent was lightly burned, and 15 percent was scorched (Keith and Creacy 2011:9). Both heavily burned and moderately burned classes represent a stand-replacing fire, where most of the canopy is killed and vegetation community succession begins again (Lost Pines Recovery Team 2011:203). It was estimated that approximately 70 percent of the canopy trees within the park would be lost as a result of the wildfire (Keith and Creacy 2011:6). By 2014, pine seedlings had begun to successfully colonize moderately and heavily burned areas (Booth and Keith 2014:5).

FAUNA

Bastrop State Park is on the western side of the Texan biotic province, which extends from central Texas to east central Oklahoma (Blair 1950:100). This province has a high faunal diversity, with at least 57 species of reptiles, 49 native species of mammals, and 23 species of amphibians (Blair 1950:100-102).

Common mammals include white-tailed deer (*Odocoileus virginianus*), nine-banded armadillo (*Dasypus novemcinctus*), eastern cottontail rabbit (*Sylvilagus floridanus*), gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes fulva*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), raccoon (*Procyon lotor*), and Virginia opossum (*Didelphis virginiana*). Bison (*Bison bison*) also have been present in the general area during certain intervals in prehistory

(Dillehay 1974:182, 184; Huebner 1991:347-350). Some of the larger breeding birds are wild turkey (*Meleagris gallopavo*), black vulture (*Coragyps atratus*), turkey vulture (*Cathartes aura*), northern bobwhite quail (*Colinus virginianus*), and mourning dove (*Zenaida macroura*). Large numbers of snow geese (*Chen caerulescens*), greater white-fronted geese (*Anser albifrons*), and a variety of duck species winter in the region (Rappole and Blacklock 1994). Although rare, both the bald eagle (*Haliaeetus leucocephalus*) and the peregrine falcon (*Falco peregrinus*) have been recorded at the park (Black et al. 2000:II-7). Historically, the greater prairie-chicken (*Tympanuchus cupido*) was also prevalent in the region (Rappole and Blacklock 1994:70).

Aquatic food resources could have included fish from rivers and large creeks and freshwater mussels. Mussel shells were a prominent part of the archeological assemblage at the McKinney Roughs site (41BP627), roughly 10 miles west of Bastrop State Park (Carpenter et al. 2006:141).

The largest population of the endangered Houston toad (*Bufo [Anaxyrus] houstonensis*) occurs in the Bastrop Lost Pines ecoregion (Griffith et al. 2007:71). Despite the impacts of the 2011 fire, the microclimatic parameters of their habitat were not negatively impacted (Brown et al. 2014:180).

HISTORIC LAND USE

The vegetation, wildlife, and soils of Bastrop State Park have been altered to a degree by human activities since the first recorded settlers arrived in the area in the mid-nineteenth century. In 1795, a route of the Camino Real was established through the pine forest. State Highway 21 follows the route of the Camino Real as it was redrawn near the end of the Spanish period; it runs along the west edge of Bastrop State Park, and some abandoned segments of the road are in the park (Weddle 2012:49, 74-76). In 1831 a trail referred to as the Gotier Trace was opened through the woods, to connect the relatively young town of Bastrop to the municipality of San Felipe; this road passes through Bastrop State Park (Newlan 1993:4; Weddle 2012:48-49).

The most significant land use impacts to the area that is now in Bastrop State Park resulted from logging, which began as early as 1838 and continued for nearly 100 years (Newlan 1993:15, 18). An early park superintendent noted in 1934 that the area was little more than a thicket with a scattering of stunted pines, as a result of unrestricted logging and brush fires (Newlan 1993:15). In addition to cutting down trees, logging also involved the clearing and use of roads for draught animals and carts, and the construction of fencing and corrals for the animals. Sawmills would then process the lumber; a sawmill established in the community of Yewpon in 1903 appears to have been in or near the park. In the eastern part of the park (acquired in 1979) deed records indicate that a mill was established somewhere on that 1,600 acre tract in 1855 (Newlan 1993: Appendix C). Logging and other land uses also contribute to erosion and other ecological changes, including a change in the understory vegetation (Skelton and Freeman 1979:16).

An area around Copperas Creek in the western part of the park, just south of State Highway 21, was cleared for development as a country club in 1913. Part of this development included building a dam on the creek to create a lake for fishing, which was substantially completed by December 1914 (Newlan 1993:7-9). The Bastrop Country Club development was significant in raising awareness of the potential of the Lost Pines as a recreational area (Black et al. 2000:I-21-22). By 1917, a warden's cottage and a guest house also had been constructed; the guest house was still standing when Civilian Conservation Corps (CCC) work began at the park in 1934 (Newlan 1993:9).

The CCC crews constructed numerous buildings and modified the landscape in many ways. Scrub trees were cleared, and wood and stone were obtained from the park for use as building materials (Newlan 1993:10-11). Nine miles of truck trails were constructed, foot trails laid out, small trees planted, and 10 miles of fences strung (Newlan 1993:11). Large projects included construction of the nine-hole golf course with associated sprinkler system and lake, and the swimming pool (Newlan 1993:12). Other impacts included construction of infrastructure such as water and wastewater lines, bridges, and culverts. The CCC impacts are limited to the western section of Bastrop State Park and Park Road 1C.

Agricultural impacts in Bastrop State Park are not as significant as in other parts of Bastrop Country, as the Lost Pines were utilized more for timber than as farmland. Examination of historic aerial photographs of the park area from 1938 and 1951 show a number of cleared areas in the northeastern section of the park. Most are roughly rectangular, and are located in the same areas in 1938 and 1951.

3. PREHISTORIC BACKGROUND, HISTORIC BACKGROUND, AND PREVIOUS INVESTIGATIONS

by John Lowe, Logan McNatt, and Margaret Howard

This section provides information on the Native American culture history in Bastrop County and its surroundings, as well as previous archeological investigations in Bastrop State Park. Initially, the Native American cultural sequence for the eastern Edwards Plateau is delineated, and applied to Bastrop County with some caveats. Sites in the vicinity of Bastrop State Park with components dating to those time periods are identified as part of that discussion. The archeological investigations in Bastrop State Park are then described in chronological order. Finally, the geomorphic contexts of archeological sites in the mantle of sandy soil that covers almost all of Bastrop County are reviewed.

NATIVE AMERICAN CULTURE HISTORY

The prehistoric culture history of Bastrop State Park is somewhat complicated, as Bastrop County lies at the margins of three prehistoric cultural regions: Central Texas, East Texas, and the Upper Gulf Coastal Plain (Goode 1989:73-75; Nightengale et al. 1992:7). Michael Collins (2004:102, 105) includes Bastrop County within the eastern margin of the Central Texas archeological region. Others, such as Tim Perttula and Linda Ellis (2013:114) place Bastrop County on the western margin of the Post Oak or Prairie Savanna Region. Ross Fields (2004:348) suggests that the prehistory of the southwest part of the Post Oak Savanna, including Bastrop County, is more closely associated archeologically with central Texas and the coastal area.

Bruce Nightengale et al. (1992:7) note that defining a cultural chronology for Bastrop County is problematic, due to the unconsolidated sandy matrix of most of the archeological sites. These sandy soils are not conducive to the preservation of organic materials for radiocarbon dating, and the cultural deposits in them are thought to have poor stratigraphic integrity. For this reason, the cultural sequence developed by Collins (2004) will be used for this study even though it draws primarily from the Edwards Plateau. Much information on the prehistory of this part of the Colorado River basin comes from work at Camp Swift, located ca. 6.8 miles (11 km) north of Bastrop State Park, and Lake Bastrop, which is ca. 2.8 miles (4.5 km) north of the park. The prehistoric cultural sequence is divided into three main periods: Paleoindian (ca. 9250 to 6850 B.C.), Archaic (ca. 6850 B.C. to A.D. 750 B.C), and Late Prehistoric (ca. A.D. 750 to 1690), with style intervals delineated within each major period that reflect distinctive archeological patterns (Collins 2004:112-113, 116-123).

Paleoindian Period

At the time when Collins wrote his cultural sequence, there was no evidence for a pre-Clovis (earlier than 9250 B.C.) presence in Central Texas (Collins 2004:116). Recently,

excavations at the Debra L. Friedkin site (41BL1239) in Bell County have identified artifacts underlying Clovis deposits; the assemblage has been designated as the Buttermilk Creek complex and dates as far back as 13,500 B.C. (Waters et al. 2011). Ca. 250 m upstream from the Friedkin site, a probable older-than-Clovis component at the Gault site (41BL323) also has been investigated (Collins 2014; Gilmer and Frederick 2014).

The commonly accepted Paleoindian sequence in Central Texas begins with the early Paleoindian period, 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 projectile point, and an associated tool assemblage dating from ca. 9250 to 8950 B.C. (Collins 2004:116). Once thought of being based solely 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). According to the Texas Clovis Fluted Point Survey (Bever and Meltzer 2007:67), only one Clovis point has been reported from Bastrop County. A Clovis preform was found at site 41BP495 in Camp Swift during test excavations in 2002 (Nickels and Worrell 2010:60); the site also yielded Late Archaic and Late Prehistoric dart points.

The Clovis style interval is followed by an interval represented by Folsom, Midland, and Plainview points and assemblages. There is still some debate about the exact chronology and association of these points, which are often found together and in the case of Plainview, are too broadly defined (Bousman et al. 2004:48-60), but they date from roughly 8950 to 8050 B.C. (Collins 2004:113). This period saw 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). No sites with Folsom, Midland, or Plainview components were identified in Bastrop County in a 1994 search of the records at the Texas Archeological Research Laboratory at The University of Texas at Austin (TARL; Bousman et al. 2004:64). None were identified during any of the Camp Swift projects (Nickels et al. 2010:13-14, 370). Robinson's (1987:62) discussion of the Piney Ridge (41BP290) site near the Colorado River notes that a Plainview point was collected from the site and is in a private collection in Houston, but this identification was not noted in the Texas Archeological Sites Atlas. A Plainview point base also was found at site 41BP264 in the CPS Butler lignite prospect (Brown 1986:14). Turner et al. (2011:45, 152) suggest that the Plainview type has been too broadly applied, and note that in the late 1990s and early 2000s, researchers reclassified many points as St. Mary's Hall that had once been identified as Plainview (Turner et al. 2011:156).

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 Pleistocene megafauna necessitated a shift to smaller game, although *Bison bison* (the smaller, modern species) was still consumed in some areas (Bousman et al. 2004:82-83). The greater variety and more limited distribution of late Paleoindian projectile points indicates that mobility ranges were smaller

than in the early Paleoindian period (Lohse and Bousman 2006:12). Collins (2004:118) suggests that late Paleoindian subsistence, fire-cracked rock features, and even some tool types are more Archaic in nature, and that the late Paleoindian period is a transitional stage between early Paleoindian and Archaic. Bousman and Oksanen (2012:198) go so far as to propose reviving Krieger's (1964) term ProtoArchaic for this period following the dawn of the Holocene.

Late Paleoindian projectile point types in Texas include Wilson, Dalton, St. Mary's Hall, Golondrina, Barber, Scottsbluff, and (debatably) Angostura. Collins (2004:118) proposes three style intervals for the late Paleoindian period in Central Texas: Wilson, Golondrina-Barber, and St. Mary's Hall. Wilson points are the earliest stemmed projectile points in Texas, and date from ca. 8050 to 7900 B.C. at the Wilson-Leonard site (41WM235; Bousman 1998:161). Both Golondrina-Barber and St. Mary's Hall points are more traditional Paleoindian lanceolate points; those components at Wilson-Leonard date from 7550 to 6850 B.C. (Bousman 1998:163-164). Duke (1977:15) collected a resharpened "Plainview Golondrina" point from site 41BP78; Kelly and Roemer (1981:3) later identified it as a Golondrina point through computer-assisted classification. A number of other sites in Bastrop County have unspecified possible Paleoindian components (TARL files).

The chronological placement of Angostura points has been a matter of debate. Collins (2004:118) notes that use of Angostura points continues from the late Paleoindian period into the Early Archaic period, reflecting the transitional nature of the earlier period. He then places the Angostura style interval—dating from 6850 to 6450 B.C.—at the start of the Early Archaic (Collins 2004:119). Others including Turner et al. (2011:51, 59) place Angostura at the end of the late Paleoindian period, with dates ranging from 6850 to 6000 B.C.

Early Archaic Period

While the precise date when the Archaic period began is a matter of debate, the period was marked by changes in material culture, subsistence, mobility, and other behaviors that persisted with only minor modifications for over 7,000 years. The subsistence shift was intensified hunting and gathering of local resources, and a greater reliance on plant foods. One of the most significant elements of Archaic lifeways is reflected in the extensive use of heated rocks for cooking and other purposes, represented by hearths, ovens, and middens (Collins 2004:119; Lohse and Bousman 2006:13). There was a greater diversity in chipped stone tool types, including woodworking tools such as Clear Fork and Guadalupe bifaces, and ground stone technology became 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 the large, extensive deposits at Wilson-Leonard in Williamson County, Gault in Bell County, and Kennedy Bluffs (41BP19) in Bastrop County suggest that 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). The extensive Early Archaic components at the Gatlin site (41KR621) in Kerr County suggest that during this period the site was used by small groups for short periods, possibly as part of a seasonal round, and slowly intensified over time (Oksanen et al. 2008:12-8 to 12-10). Collins identified three dart point style intervals for the Early Archaic: Angostura (see above), early split-stem (Gower and Hoxie), and Martindale-Uvalde (Collins 2004:119).

At least one Early Archaic site has been excavated in Bastrop County. The Kennedy Bluffs site is located south of State Highway 71 near the confluence of Alum Creek and the Colorado River. Professional excavations within the highway right-of-way identified multiple prehistoric components ranging from the Early Archaic through the Late Prehistoric periods. All of the components showed signs of mixing and disturbance, although in general the artifacts were older with depth (Bement et al. 1989:54). Early Archaic dart points included an Angostura base, an Angostura-like lanceolate biface recovered from the surface, and a Gower-like point (Bement et al. 1989:39-41). Lithic artifacts recovered from amateur excavations south of the right-of way also were identified and analyzed. Artifacts from the lower Early Archaic zone included one Angostura point and a number of lanceolate bifaces/dart points, some of which compare favorably to Angostura (Goode 1989:77-88). The upper Early Archaic zone included two points identified as Gower or Hoxie (Goode 1989:90) as well as points that date to the Middle Archaic period. Clear Fork and Guadalupe bifaces also were recovered from the Early Archaic zones, including seven Guadalupe tools within a 1 m square area (Goode 1989:111-135).

Other sites with Early Archaic components in Bastrop County include 41BP345, where a possible Angostura point base was recovered from a shovel test during survey at Lake Bastrop State Park (Tomka and Crouch 1996:33, 49). Excavations at site 41BP679 produced a Clear Fork tool and a biface with parallel flaking reminiscent of that found on Angostura points (Munoz 2006:14, 26). An Angostura point proximal fragment was recovered from site 41BP485 at Camp Swift (Robinson 2001:122). A Uvalde point was recovered from the surface of 41BP66, the Appelt site (Robinson 1987:109). Robinson (1987:48-51, 56, 60-61, 65, 135-177) mentions Early Archaic components at several other sites recorded along the Colorado River during the Bastrop County Sesquicentennial Project, including 41BP40, 41BP48, 41BP279, 41BP282, 41BP285, and 41BP292, but specific time-diagnostic dart points are not noted.

Middle Archaic Period

Collins (2004:120) and Johnson and Goode (1994:24-25) place the start of the Middle Archaic period around 4000 B.C., marked by a change in lithic technology. Bison were present in central Texas, and people from the prairie margins and woodlands apparently followed them into the area. Their tool kits included specialized bison-hunting weaponry beginning with Bell, Andice, and Calf Creek dart points, followed by Taylor and Early Triangular dart points (Collins 2004:120;

Johnson and Goode 1994:24-25). These are all extremely thin, wide, triangular bifaces with long thinning flakes emanating from the base; the earlier types have deep, narrow basal notches while the later types are unnotched (Collins 2004:120). These thin blades could serve both as knives and as the tips of darts or spears, and impact fractures from use as weapons are common on Bell, Andice, and Calf Creek points (Collins 2004:120). Bison were sparse or gone by the Taylor style interval (roughly 3000-2500 B.C.; Collins 2004:115, 120).

Burned rock middens appeared in Central Texas during the Taylor style interval (Prewitt 1981a:73, 78; Collins 2004:120-121). These piles of fire-cracked rocks and ash built up around ovens that had rocks as heating elements, accumulating over time on stable landforms (Black and Creel 1997:271). These features are absent from the Bastrop County archeological record, however, based on previous reports (e.g., Lohse and Bousman 2006:14) and a Texas Archeological Sites Atlas search.

The Nolan-Travis style interval is at the end of the Middle Archaic period (Collins 2004:120-121). These dart points evidence another technological shift, as they are comparatively thick, often have narrow blades and shoulders, and are stemmed, with Nolan points having distinctively beveled stems (Collins 2004:121). This style interval dates from roughly 2600 to 2000 B.C. (Prewitt 1981a:78; Turner et al. 2011:142, 165).

Sites with Middle Archaic components in Bastrop County are somewhat rare. Lohse and Bousman (2006:14) suggest that at Camp Swift, severe erosion of the loose sandy sediments may have destroyed landforms with Middle Archaic cultural components, although Andice and Early Triangular dart points were recovered from sites 41BP390 and 41BP728, respectively (Bousman et al. 2010:372). A Morrill point was collected from the surface of site 41BP345 at Lake Bastrop State Park (Tomka and Crouch 1996:50); this somewhat poorly defined type is more common in north-central and northeast Texas and is not well dated. Turner et al. (2011:139) place it in the Middle Archaic period, while Fields (2004:351) places Morrill in the Late Archaic. Story (1990:219) associates Morrill points with Carrolton points, one of which was radiocarbon dated to 1864 +/- 57 B.C., which postdates Collins' (2004) Middle Archaic period.

Two Early Triangular points were recovered at the Kennedy Bluffs site, and included within the Early Archaic zone (Bement et al. 1989:94). A Middle Archaic zone, more or less stratigraphically separated from earlier deposits, included four points associated with the Nolan-Travis style interval (Bement et al. 1989:96-97).

In Bastrop State Park, a probable Nolan dart point was collected from the surface of site 41BP69 in 1965 (TARL records). Two other sites—41BP377 and 41BP428—yielded dart point bases described as Travis-like (Medlar 1995:33, 37) although they are listed elsewhere as untyped (Medlar 1995:34, 39).

Several sites recorded along the Colorado River during the Bastrop County Sesquicentennial Project include Middle Archaic components (Robinson 1987). Time-diagnostic

dart points at the Appelt site include a Bell point, three Travis points, and a Wells point (Robinson 1987:109). Wells dart points have long, contracting stems and are more common in east and east-central Texas, and into Louisiana, Arkansas, and Oklahoma. Turner et al. (2011:170) estimate their age range to be roughly 4000 to 2500 B.C. Test excavations at the Wagner site (41BP279) produced multiple time-diagnostic dart points including an Andice point and two Travis points (Robinson 1987:149-150). Nine other sites with Middle Archaic dart points are noted by Robinson (1987:48-77), but no specific types are named in the report or in the Texas Archeological Sites Atlas.

Two Middle Archaic components are represented at the Kennedy Bluffs site, where a Taylor, a Travis, and three Nolan dart points were recovered from somewhat mixed deposits (Bement et al. 1989:35-44). A radiocarbon date on a piece of charcoal in a burned quartzite and chert cobble feature brackets a range of 3770 to 3570 B.C. (Bement et al. 1989:22-25), which falls within the Bell-Andice-Calf Creek style interval. Two of the 10 technically sound thermoluminescence dates obtained from sandstone rocks in a fire-cracked rock pavement feature at the site overlap the latter half of the Middle Archaic period (Bement et al. 1989:25-26).

Late Archaic Period

The Late Archaic period began around 2000 B.C. (Collins 2004:121). Across central Texas and much of Texas as a whole, the Late Archaic period saw more intensive use of sites, indicating increased populations, more frequent use of sites, and/or longer occupations (Johnson and Goode 1994:36; Prewitt 1981a:73-74, 79-82). Collins (2004:121) notes six style intervals for the Late Archaic based on dart points recovered from stratified contexts. Johnson and Goode (1994:36) divide the Late Archaic into two subperiods with the division following the Marcos-Montell-Castroville style interval, while noting that Castroville points are considered to be transitional.

Bulverde dart points date from roughly 2000 to 1500 B.C. (Turner et al. 2011:67) and are largely confined to Central Texas (Prewitt 1981a:79); they have thin, finely-chipped bases with wedge-shaped cross sections. Pedernales dart points date from 1500 to 500 B.C., and are the most common dart point type in Central Texas (Turner et al. 2011:148). A population increase that began near the end of the Middle Archaic period continued throughout this period and by the Pedernales style interval had become substantial, as evidenced by increased site frequencies (Johnson and Goode 1994:36; Prewitt 1981a:73).

Prewitt (1981a:80) dates the Lange-Marshall-Williams style interval to 650 to 300 B.C., and Turner et al. (2011:127) cite a radiocarbon date range for Lange dart points of 850 to 600 B.C.; both indicate a slight overlap with the Pedernales time range. Johnson and Goode (1994:35) note that Marshall, Pedernales, and (later) Montell dart points exhibit technological continuity in terms of expert billet thinning that is also reflected in large, flat oval knives in sites where these points are found. Prewitt (1981a:80) notes that marine shell ornaments begin to appear in central Texas

during this time, indicating probable contact with coastal groups or at least the existence of a trade network.

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, subsistence was broad-based (Johnson and Goode 1994:35-36; Prewitt 1981a:73-74, 81). Johnson and Goode (1994:37) see evidence of influence or interaction from the Southern Plains in the form of Marcos points. Prewitt notes that the time-diagnostic dart points for this interval also are prevalent in the Lower Pecos region, and suggests that the proliferation of point styles and their broad distribution may indicate a shift back to dispersed bands roaming across large areas (Prewitt 1981a:74, 81).

A rather significant shift in dart point styles and broader cultural practices began around 600 B.C. (Johnson and Goode 1994:36); Prewitt (1981a:81-82) also observed these changes but suspected that they began much later. These differences are notable enough that Johnson and Goode (1994:36) consider them to indicate the start of the Late Archaic II subperiod. Collins (2004:122) summarizes them as "diverse and comparatively complex archeological manifestations" that attest "to the emergence of kinds of human conduct without precedent in the area." They are reflected in the archeological record by apparent ritual items including marine shell pendants and gorgets, elaborate bone ornaments, and atlatl weights and other stone objects made of nonlocal materials (Johnson and Goode 1994:37-38; Prewitt 1981a:81). Some causal factors that have been proposed include population growth and influence from groups in the eastern United States. Johnson and Goode (1994:37-38) note that this period coincides with the spread of goods associated with religious cults originating in the eastern United States during the contemporaneous Middle Woodland period.

The technological shift is reflected in the Ensor-Frio-Fairland style interval. These dart points are much smaller than points in the preceding periods; they have narrow blades, and were manufactured using more fine pressure flaking than broad billet flaking (Carpenter and Miller 2013:353; Johnson and Goode 1994:36). Ensor dart points are widespread across the central and south parts of Texas and extend across a broad area of Texas (Prewitt 1981a:81; Turner et al. 2011:94). Frio dart points are also widespread, and some analysts suggest that there is a gradation between the Frio and Ensor types (Turner et al. 2011:94, 106). Fairland dart points are primarily found in central Texas with a few specimens to the south and southwest, and also grade into Ensor and Frio types at some sites (Turner et al. 2011:99). Prewitt (1981a:81-82) notes a proliferation of formal tool types and a lower ratio of dart points to other tools during this time, and interprets it as an emphasis on gathering within a broad subsistence base. Dates for the Ensor-Frio-Fairland style interval differ somewhat among the chronologies; Johnson and Goode (1994:5, 38, 40) give it a range of 200 B.C. to A.D. 400, while Prewitt (1981a:81-82) and Collins (2004:113) state that it spanned a period from A.D. 200 to 600.

The final millennia of the Archaic in Central Texas saw the gradual emergence of tribal social networks, a macroeconomic sphere, and economic shifts toward regional integration (Carpenter and Miller 2013:355). That style interval is indicated by Darl, a small, slender dart point that may have come into use as early as A.D. 200 (Turner et al. 2011:82). Johnson and Goode speculate that the small Darl points actually may be the first arrow points that appeared in Central Texas (Johnson and Goode 1994:40). The Darl style interval lacks nonlocal artifacts (Prewitt 1981a:82), and there are some indications that site occupations were less intensive (Carpenter and Miller 2013:352).

Numerous Late Archaic sites have been identified in Bastrop County, possibly reflecting an increase in population, a better level of preservation, and/or higher archaeological visibility. Two are reported in Bastrop State Park. A Darl dart point was recovered from a shovel test between 40 and 60 cm below surface at site 41BP824 (Wilcox et al. 2007:25). A Lange dart point was recovered between 0 and 20 cm below surface in a shovel test at site 41BP538 (McNatt 2012:6-7).

Thirteen sites with mostly unspecified Late Archaic components along the Colorado River were investigated during the Bastrop County Sesquicentennial Project (Robinson 1987:48-77). The Appelt site contained dart points from all of the Late Archaic style intervals (Robinson 1987:109-113); a charred nut shell or bulb from a hearth feature (Feature 6) yielded an uncorrected radiocarbon date of 1670 +/- 70 years before present (Robinson 1987:91). The Wagner site produced Bulverde, Lange, and Darl dart points (Robinson 1987:149-152). It should be noted that the deposits at both sites were mixed, and many projectile points were recovered from the surface rather than during excavation.

Ten sites with Late Archaic components were identified during several survey projects at Camp Swift (Bousman et al. 2010:371), including one site (41BP521) where Castroville and Ensor dart points were recovered (Nickels and Worrell 2010:62). The sites constitute 40 percent of the prehistoric sites where time-diagnostic artifacts were recovered. The most common Late Archaic dart point found at Camp Swift is Pedernales (three), followed by Ensor (two), with six other types represented by single specimens (Bousman et al. 2010:372).

The Late Archaic period is not well represented at the Kennedy Bluffs site, because most of the uppermost cultural deposits had been removed or disturbed by machinery (Bement et al. 1989:100). Several Pedernales points and a possible Bulverde point were recovered from what was termed the Middle Archaic, Upper Zone (Bement et al. 1989:100-101), although these dart points are now considered to date to the start of the Late Archaic period.

Substantial data on the Late Archaic period were recovered from excavations at the McKinney Roughs site (41BP627), near the Colorado River in western Bastrop County. Several discrete Late Archaic living surfaces with little compression or overprinting were identified in alluvial deposits (Carpenter and Miller 2006:197). They included two Ensor components

(although only one had an identifiable surface) and a Darl component (Carpenter 2006:149-150). Radiocarbon dates were obtained for all three components. The earlier Ensor component has a 2-sigma calibrated age range of 190 B.C. to A.D. 10, based on charcoal from a rock-lined, basin shaped hearth (Carpenter et al. 2006:86, 94-96). The later Ensor component has a 2-sigma calibrated age range of A.D. 80 to 250; the charcoal sample was recovered from the matrix of a basin-shaped charcoal stain (Carpenter et al. 2006:86, 99-100).

The Darl component at McKinney Roughs included two fire-cracked rock features with charcoal. Feature 3 was an occupational surface with a stone-boiling discard sub-feature; a Darl dart point was recovered beneath several of the rocks (Carpenter et al. 2006:89-91). A radiocarbon assay on wood charcoal from the broader feature yielded a 2-sigma calibrated age range of A.D. 990 to 1380, falling much later than the commonly recognized temporal range for Darl points (Carpenter et al. 2006:86, 90). Feature 7 in the Darl component was a cluster of fire-cracked rocks, burned sediment, and charcoal-stained matrix with no directly associated time-diagnostic artifacts. Charcoal from the matrix yielded a 2-sigma calibrated radiocarbon date of A.D. 980 to 1250 (Carpenter et al. 2006:86, 96-98), which is also later than the common Darl time range.

Late Prehistoric Period

The Late Prehistoric period opened with the adoption of bow and arrow technology. Other than this technological shift, little in terms of subsistence and economy changed from the Late Archaic Ensor-Frio-Fairland style interval through the Austin style interval of the Late Prehistoric period (Collins 2004:123; Johnson and Goode 1994:40). Galindo et al. (2013:333) note that there is a high level of morphological similarity between the Ensor-Frio-Fairland dart point continuum and Edwards arrow points.

The Late Prehistoric period in Central Texas begins around A.D. 700 (Carpenter et al. 2013:255-259; Johnson and Goode 1994:40; Henderson 2001:277-278). The period is further divided into the Austin style interval, followed by the Toyah style interval (Collins 2004:122). Arrow point types associated with the Austin interval include Edwards, Scallorn, and Sabinal (Johnson and Goode 1994:40; Turner et al. 2011:190, 208-209). Evidence of arrow-wound fatalities in human burials suggests that widespread hostilities may have occurred during the Austin interval (Collins 2004:122-123; Prewitt 1981a:83).

The onset of the Toyah style interval around A.D. 1200 represents a significant shift in the technology, cultural patterns, and subsistence base in Central Texas (Collins 2004:123; Johnson and Goode 1994:41). It saw the introduction of pottery (locally produced and imported), prismatic blades, formal end scrapers, and thin beveled knives (Collins 2004:123). The dominant arrow point style was the narrow, strongly barbed, contracting-stem Perdiz point, representing a distinctive design shift from the more triangular, expanding stems of the Austin interval arrow points. The onset of the Toyah interval coincides with a period when bison herds moved south onto the Edwards Plateau (Johnson and Goode 1994:41), although recent studies suggest a more

complicated cycle of bison presence and absence during the Late Prehistoric period (Mauldin et al. 2012:108). The artifacts associated with Toyah occupations are generally considered to be part of a bison procurement and processing toolkit (e.g., Prewitt 1981a:74, 85), possibly originating from the Plains to the north (Johnson 1994:287).

Central Texas ceramics include several locally-made, bone-tempered wares: 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). In the Post Oak Savanna, Caddo pottery is more commonly found in the northern area in the Trinity and Navasota River basins (Perttula and Ellis 2013:131), while ceramics similar to southeast Texas coast wares are most common in the Colorado River basin (Perttula and Ellis 2013:128-130). Overall, the variety of pottery types suggest a broad scale of interaction during the Toyah style interval that included both physical goods and manufacturing technology.

The Toyah style interval in Central Texas ended around A.D. 1700, with the first documented arrival of Europeans (Collins 2004:123). By that time, the consequences of the earlier arrival of Europeans elsewhere in North America were already occurring throughout Texas, notably the southern advance of Apaches mounted on horses, the conquest of Mesoamerica by the Spanish, and the spread of European-introduced diseases (Collins 2004:123). Numerous displaced groups made their way into central Texas and Bastrop County (Campbell 1988:72), so the indigenous cultural patterns encountered by the early travelers and settlers are not direct analogs of prehistoric patterns.

Late Prehistoric occupations in Bastrop County include the Kennedy Bluffs site, where 14 arrow points were recovered, consisting of nine Scallorn points, two Perdiz-like points, and three points typed as Granbury which appear to be preforms (Bement et al. 1989:47). Excavations at site 41BP678 recovered seven ceramic sherds, including a handle fragment, from the upper component at the site. Five of them are bone-tempered and appear to be Leon Plain, while two are sand-tempered and were not identified to type (Tomka and Figueroa 2006:43). No time-diagnostic lithic artifacts were recovered.

At Camp Swift, 11 sites with Late Prehistoric components have been identified over the course of multiple surveys and excavations (Bousman et al. 2010:372). Arrow points consist of 11 Scallorns, one Edwards, one Granbury, and one Turney (Bousman et al. 2010:372). Turney arrow points are associated with the central part of the Neches River valley in northeast Texas and date to the Historic period (Turner et al. 2011:214), so that artifact may have been misidentified. Untyped sandy paste pottery was recovered from 41BP100 and 41BP488; the latter site also produced Scallorn and untyped arrow points and an untyped Late Archaic dart point (Bousman et al. 2010:370, 372).

Twelve sites with Late Prehistoric components were recorded along the Colorado River during the Bastrop County Sesquicentennial Project (Robinson 1987:48-77). Five of them were unspecified Late Prehistoric, two dated to the Austin style interval, one dated to the Toyah style interval, and four contained both Austin and Toyah components. Excavations at the Appelt site recovered Scallorn and Edwards arrow points representing the Austin interval along with a Perdiz preform from the Toyah interval (Robinson 1987:89, 123-126). Charcoal from two hearth features yielded uncorrected Late Prehistoric radiocarbon dates: Feature 3 was dated to 640 +/- 50 years before present, and Feature 5 was dated to 1160 +/- 340 years before present (Robinson 1987:90-91). Two sandy paste ceramic sherds recovered at the Appelt site are thought to be similar to upper Texas coast wares (Robinson 1987:134). Excavations at the Wagner site also recovered artifacts from the Austin and Toyah intervals, including two Scallorn and five Perdiz arrow points (Robinson 1987:157-158). Two small hearths are associated with the Toyah component, based on their proximity to time-diagnostic artifacts including pottery (Robinson 1987:146). Fourteen small sherds were recovered; six are bone-tempered Leon Plain ware. Five are sandy paste sherds associated with the upper Texas coast, two sherds are grog-tempered probable Caddo ware from east Texas, and one sherd is similar to north Texas wares (Robinson 1987:160-161).

HISTORIC CULTURE HISTORY

The first settlers arrived in the vicinity of Bastrop State Park in the mid-nineteenth century, although a route of the Camino Real had been established through the pine forest in 1795. The final designated route of the Camino Real, State Highway 21, runs along the west edge of Bastrop State Park, and some older segments ran through the park. The Gotier Trace opened in 1831 to connect the relatively young town of Bastrop to the municipality of San Felipe, and passes through Bastrop State Park.

The timber industry had a major impact in the area. Logging in the area that is now the park began as early as 1838, and continued for nearly 100 years. Roads were built for animals and carts to haul the timber to sawmills. There may have been a mill in the east part of the park in the nineteenth century. Farming and ranching were not as common on the land within the park as in other parts of Bastrop Country, for the Lost Pines region was utilized more for timber than as farmland. A few small areas in the northeastern area of the park may have had pastures or corrals for livestock such as cattle or horses, associated with small homesteads.

In the east part of the park near Alum Creek, settlement began as early as the mid nineteenth century. In 1902 the small community took on the name of Yewpon when a post office was established there (see Appendix A). The settlement included a sawmill and possibly a school. The post office closed in 1918 as settlement in that area dwindled.

An area in the older, west part of the park was developed as a country club in 1913, to encourage purchase of the surrounding lots. A dam was built on Copperas Creek to create a lake, and a caretaker's cottage and guest house were built by 1917. The lake served as a popular scenic

destination and fishing spot, and signaled the increasing awareness of the Lost Pines as a recreational site.

Plans for creating a park in the pine groves between Bastrop and Smithville were investigated as early as 1931. The Texas State Parks Board began to acquire the land that is now in the park in 1933. By 1934, CCC Companies 1805 and 1811 were at work in the park. They constructed numerous buildings and landscape features. Scrub trees were cleared and areas scoured for building materials, including wood and stone. Truck trails were constructed, foot trails laid out, small trees planted, and fences strung. Large projects included the nine-hole golf course, with associated sprinkler system, and the swimming pool. Infrastructure to support the park was constructed, including water and wastewater lines, bridges, and culverts.

ARCHEOLOGICAL INVESTIGATIONS IN BASTROP STATE PARK

A total of 67 archeological sites have been recorded in Bastrop State Park between 1965 and 2015. Five sites were recorded in the 1960s (n=1), 1970s (n=3), and 1980s (n=1). Ten sites were recorded in the 1990s during three surveys (Anthony and Brown 2000; Kegley 1994; Medlar 1995). Thirteen sites were recorded in 2007 (Wilcox et al. 2007). In 2007, one site was recorded in September (McNatt 2012) and 12 sites were recorded during the current investigations. Twenty-five sites were recorded in 2012 (Haeffner et al. 2012) and one site was recorded in 2015 (Barnes 2016).

Thirty archeological investigations have been conducted in Bastrop State Park to date, beginning in 1965 and including the current investigations. The records and reports on six of them do not contain precise information on their location and extent. The remaining 24 projects—including the 1,573.2 acres covered during the current investigations—total 3,326.3 acres, comprising 49.5 percent of the park.

In August 1965, 41BP69 was the first archeological site to be recorded in the park, by avocational archeologist Pauline Zoeller. The site is a prehistoric lithic scatter, and a probable Middle Archaic Nolan dart point was collected by a Boy Scout. Zoeller collected a scraper and a sample of debitage, and submitted a site form and sketch map to TARL. In January 1977, TPWD archeologist Ronald Ralph reassessed the site and extended its boundaries to include the crest of a linear ridge (Ralph 1996:44-45). In March 1982 Ralph again reassessed the site during a survey for a proposed trail. He noted that erosion caused by an abandoned motorcycle trail and pedestrian traffic had exposed scattered artifacts, and recommended that the trail be rerouted to avoid the site (Ralph 1997:35). In September 1995, the TPWD Archeology Survey Team conducted shovel testing in the uphill part of the extensive site during a cultural resources training (Howard Hines 1995). Three shovel tests were excavated to depths of 80 to 100 cm and produced chert debitage and one core. A concentration of fire-cracked rocks that appeared to represent a hearth was found in gray-stained sediments from 60 to 80 cm below surface in Shovel Test 3. A dart point was recovered from the surface but could not be conclusively typed. Because the cultural deposits

extended to a depth of over 1 m, contained moderate amounts of chert debitage, and appeared to preserve fire-cracked rock features, Howard Hines (1995:383) judged its research potential to be relatively high. The site was designated as a State Antiquities Landmark in 1983.

In March 1974, site 41BP76 was recorded by former landowner George Fern, who wrote to TARL about a discovery he had made around 1964 (TARL records). He had collected two "stone axes or knives" with "a very wavy cutting edge." His description of those tools suggests they are similar to the large core tools found at numerous locales in the park (McNatt 2012:7; Himes 2013). Other than the general location and two bifaces, no other information was recorded about the site. The site was on private land that became part of the park in 1979.

In January 1977, site 41BP15 was recorded by TPWD archeologist Ralph based on a site visit led by Texas Archeological Society avocational archeologist Ralph Robinson (Ralph 1996). Prehistoric artifacts observed on the surface included one biface, many cores, and a few pieces of debitage. Historic artifacts included bricks, tin cans, glass fragments, and a KG Baking Powder can lid dating to 1932 (Horn 2005). Site 41BP15 was designated as a State Antiquities Landmark in 1983.

In July 1977, site 41BP83 was recorded by THC archeologist John Clark as a prehistoric lithic scatter on the grounds of the golf course. In 1992, TPWD archeologists were unable to relocate the site based on information from the site form, and testing an area that seemed likely to be its location produced no cultural materials (Black et al. 2000:II-25). At present, the location and nature of this site are unknown.

In March 1982, site 41BP261 was recorded by James Baker, an environmental engineer from Texas A&M University, who submitted a site form to TARL. It is described as a prehistoric lithic scatter covering about 200 m^2 on a sandy bench on the left bank of a major drainage. Artifacts consisted primarily of debitage, although Baker noted that "a large (18 by 8 cm) axe-like chipped biface was collected off the site by one of the park visitors." Black et al. (2000:II-26) recommended that site 41BP261 merits official designation under State Antiquities Landmark Archeological Criterion 5 because it is susceptible to vandalism due to its proximity to park visitor pedestrian traffic.

In March 1982, TPWD archeologist Ralph surveyed a proposed trail loop that included a reassessment of site 41BP69 (Ralph 1997). He also observed a probable Civilian Conservation Corps (CCC) sandstone quarry consisting of over five excavations in a 30 by 30 m area, but did not record it as a site. Ralph (1997:35) recommended that the trail be rerouted to avoid both site 41BP69 and the CCC quarry.

In June 1985, Ralph conducted a brief reconnaissance of four areas that were proposed for golf course expansion. He recommended in a memorandum (Ralph 1985) that the heavy construction impacts from removing dense vegetation would require an archeological monitor to be present.

In October 1987, Ralph examined an open utility trench in the campground that was around 152 m long, 15 cm wide, and 1.2 m deep. No prehistoric or historic artifacts were noted (Ralph 1987).

Six archeological surveys occurred during the 1990s due to utility upgrades and expansion of the golf course. In early 1991 TPWD archeologist Marybeth Tomka led a team that conducted shovel testing and monitoring of an electrical line replacement in a trailer camping loop on a flat upland ridge (Tomka 1992). Two shovel tests revealed less than 1 cm of red sandy clay over a gravel deposit of unknown depth, and produced no artifacts. Some possible fire-cracked rocks and a few pieces of debitage were observed at the base of the slope below the ridge top. Trenching for the electrical line was monitored and no cultural materials were observed (Tomka 1992:5).

In June and July 1993, TPWD archeologist George Kegley monitored backhoe trenching to replace electrical lines (Kegley 1994). The trenches had a total length of 335 m and were 30 cm wide; the project covered 2.5 acres. The trenches were up to 76 cm deep, and revealed severe disturbance in the area due to previous utility and construction work. Only four pieces of debitage were observed. In a previously disturbed area across a road from the project area, a small scatter of tested cobbles and debitage was observed, however. Kegley recorded the area as site 41BP377, recommended avoidance during future construction, and noted that the site was not expected to provide significant cultural information (Kegley 1994:287).

In July and August 1993, Carole Medlar and two other archeologists from the Borderlands Archeological Research Unit of The University of Texas at Austin surveyed 225 acres to be impacted by expansion of the golf course (Medlar 1995:15-30). Fifty-four shovel tests were excavated at 10 and 20 m intervals in high probability areas, and four sites were recorded. Site 41BP372 was a historic dump dating to park construction and maintenance in the late 1930s and 1940s. Its cultural deposits were surficial based on the single shovel test excavated (Medlar 1995:16-17). The site was later removed during golf course expansion (Black et al. 2000:II-27). Site 41BP373 includes a buried prehistoric lithic scatter of unknown age and a surficial early-twentieth-century dump. Its prehistoric cultural deposits extend to a depth of 40 cm based on six shovel tests, two 1 by 1 m test units, and one 2.5 by 0.5 m hand-excavated trench (Medlar 1995:17-26). Site 41BP374 is a prehistoric lithic procurement site of unknown age, consisting of a surface scatter of large gravels, tested cobbles, and debitage. Its cultural deposits extend to a depth of 20 cm based on the results of two shovel tests (Medlar 1995:25-28). Site 41BP375 is a historic earthen berm that probably was a late 1930s CCC construction work road, or the bed for an early-twentieth-century logging railroad spur line. It measures 108 m long by a maximum of 2.5 m wide by 1 m high. No artifacts were directly associated with the berm or recovered from three shovel tests within 10 m of it. Medlar (1995:30) concluded that none of the four sites met the criteria for listing on the National Register of Historic Places but noted that they were eligible as State Antiquities Landmarks due to their location on public property. No further work was recommended.

Also in 1993, a historic resources survey was conducted by Ralph Newlan, who documented 55 buildings, structures, and landscape features constructed through 1950, most related to the CCC construction of the park (Newlan 1993:2). The goal of this inventory was to provide an historical overview, establish historic contexts, and make recommendations on continuing preservation efforts in the park (Newlan 1993:1). One prehistoric and historic archeological site (41BP15) and two prehistoric archeological sites (41BP69 and 41BP261) were included in the inventory (Newlan 1993:81-83).

Site 41BP428 was recorded in June 1995 and reinvestigated in 1996 and 2006. It was located during the survey and limited testing of a 0.93 mile long corridor for installation of a proposed wastewater system (Medlar 1995:31-44). The multicomponent site consists of a buried prehistoric lithic scatter dating at least in part to the Archaic as evidenced by an untyped dart point base. The prehistoric cultural deposits extend to a depth of at least 1 m, based on 13 positive shovel tests. The historic deposits extend to 60 cm below surface, and consist of bottle glass and brick fragments that date to early- to mid-twentieth-century construction and recreation activities (Medlar 1995:32-33). Medlar (1995:44) stated that shovel probing of the site was not sufficient to evaluate its potential eligibility for listing on the National Register of Historic Places, but that it did not appear to hold much information potential, and concluded that excavation of a 6-inch wide trench would not significantly add to the level of disturbance at the site.

Additional work at 41BP428 occurred in February 1996. Archeologists with Espey, Huston & Associates, Inc. inspected an existing transmission line corridor adjacent to the site and observed a sparse scatter of debitage (Nash et al. 1996:21-23). Four of seven shovel tests they dug in that area yielded a total of 10 pieces of debitage between the surface and 40 cm, extending the west boundary of the site along the right of way approximately 100 m. Severe impacts from construction and maintenance of the transmission line had resulted in minimum potential for intact deposits in the survey corridor (Nash et al. 1996:21-23).

Site 41BP428 was expanded again in July 2006 when TPWD archeologist Rich Mahoney conducted a pedestrian survey and shovel testing of approximately 100 square m (0.02 acres) for a proposed viewing blind near an existing Houston toad breeding pond (Mahoney 2007a). The area was near the east end of site 41BP428, and 5 of 11 shovel tests yielded prehistoric debitage and historic artifacts between the surface and 60 cm below surface, extending the site's east boundary by approximately 30 m. The historic component in that part of the site appeared to date to the mid- to late-nineteenth century based on recovery of a blue transfer printed whiteware sherd and a very dark olive glass fragment with a heavy patina. Mahoney noted that the components were in a mixed context which could hamper the site's eligibility for official designation as a State Antiquities Landmark. He observed that additional survey would be needed to determine the site's integrity and research potential, and recommended that the wildlife viewing blind be installed elsewhere (Mahoney 2007a:30-31).

Site 41BP429 also was recorded during the June 1995 wastewater line project, and is a buried prehistoric lithic scatter of unknown age. Its cultural deposits extend from the surface to a depth of 50 cm, based on results from 10 shovel tests, six of which were positive (Medlar 1995:33-34). Medlar (1995:44) stated that shovel probing of the site was not sufficient to evaluate its eligibility for listing on the National Register of Historic Places. She concluded that it did not appear to hold much information potential, and that excavation of a 6-inch wide trench would not significantly add to the level of disturbance at the site (Medlar 1995:44).

During the same project, previously recorded site 41BP377 was tested because a wastewater irrigation field was planned for the area (Medlar 1995:35-44). Twenty-one of the 36 shovel tests that were excavated yielded lithic debitage and tools between the surface and a maximum depth of 100 cm. An untyped dart point base was recovered between 40 and 60 cm below surface. Four 1 by 1 m test units were then excavated through sandy sediments to basal clay, reaching it at depths of 50 cm (n=2), 1.4 m, and 1.8 m below ground surface. Feature 1—a probable hearth consisting of fire-cracked quartzite, chert, and sandstone cobbles—was found between 40 and 50 cm below surface in Test Unit 4; debitage was recovered from this test unit to a depth of 1.8 m. Medlar noted that previous construction activities on and near the site probably had affected its integrity, but testing had demonstrated the considerable depth of cultural deposits in some areas, and the presence of buried features. Medlar stated that site 41BP377 did not meet the criteria for listing in the National Register of Historic Places, although the site qualified as an State Antiquities Landmark due to its location on public property. She noted that the shallow burial of irrigation pipes would not affect significant archeological deposits, and recommended no further work (Medlar 1995:44).

From late July through December 1995, TPWD archeologist Art Black monitored vegetation clearing and construction of the 225-acre expansion of the golf course that had been surveyed in 1993 (Black 1996). Clearing involved brush removal by hand and use of a bulldozer to remove trees. Black made a pedestrian reconnaissance of the area after tree removal and subsequent stages of ground contouring and preparation for fairway construction, each of which exposed the soil to increasing levels of disturbance (Black 1996:378). He observed that most of the golf course is underlain by Pleistocene Uvalde Gravels, and that gravel beds were exposed on the disturbed surface in many upland areas, typically including a few tested cobbles. He found a surficial lithic scatter consisting of several tested cobbles, two cores, and a small quantity of thinning flakes that appeared to be an extension of 41BP374, and recommended that the site boundary should be expanded to include that area. Lithic artifacts were widely dispersed across the entire golf course, as was refuse from use of the course. Black concluded that modern use of areas that had been considered to be undisturbed indicated that "there is little about them that is truly undisturbed" (Black 1996:379-380). He concurred with Medlar (1995:30) that no archeological sites had been found in the project area that appeared to meet the criteria for listing in the National Register of Historic Places or that added new data to the current level of archeological knowledge of the area (Black 1996:378).

In February 1996, Espey, Huston & Associates, Inc. archeologists surveyed and shovel tested an existing transmission line right of way in Bastrop State Park (Nash et al. 1996). The survey corridor was 1.9 km (1.2 miles) long and 30 m wide, and covered 14.1 acres. It had been extensively disturbed by construction and maintenance, but a proposed upgrade had the potential to impact three of the sites recorded by Medlar in 1995: 41BP373, 41BP375, and 41BP428. A very sparse scatter of debitage was found in the right of way adjacent to site 41BP373, and four sterile shovel tests exposed dense gravels at 10 cm below surface (Nash et al. 1996:20). Site 41BP375 was originally plotted as extending into the right of way, but no evidence of it was found inside the project corridor (Nash et al. 1996:16). Site 41BP428 was found to extend into the project corridor, as discussed above. Nash stated that due to the severe construction disturbance in the transmission line right of way it was unlikely that intact cultural deposits had survived, so the parts of site 41BP373 and 41BP428 within the survey corridor did not appear to be eligible for listing in the National Register of Historic Places or merit official State Antiquities Landmark designation (Nash et al. 1996:20, 23).

In September 1997, the original 2,054 acre area of Bastrop State Park was designated as a National Historic Landmark. The park was recognized as "one of the finest illustrations of the legacy and influence of architect Herbert Maier's work" for the CCC; it was said to be a showcase of state park design and construction in Texas, which has one of the most extensive state park systems that was developed during the New Deal (Newlan et al. 1997:23). The contributing resources in the district include 17 buildings, 1 site (the golf course), and 48 structures (Newlan et al. 1997:5, 8-21). Minor structures such as culverts, retaining walls, and guardwalls were considered to be contributing parts of the road structures even though all of them were not listed individually (Newlan et al. 1997:8). The nomination states explicitly that "no archeological resources have been considered in this survey," indicating that archeological sites within the boundary of the National Historic Landmark are not considered to be contributing resources (Newlan et al. 1997:5).

In June 1998, Anthony & Brown Consulting surveyed and shovel-tested two corridors proposed for installation of utility lines: a 0.35 mile water line and a 0.5 mile wastewater line (Anthony and Brown 2000). Shovel tests were excavated at 30 m intervals where soils were present. Most shovel tests were excavated to an average depth of 70 cm, but did not reach sterile gravel or clay layers in the deep sandy soils. Much of the wastewater corridor could not be tested because of densely packed, cobble-sized gravels. Three sites were recorded. Site 41BP536 is a prehistoric lithic scatter of unknown age that was sampled by five shovel tests ranging from 30 to 80 cm in depth in sandy deposits with up to 80 percent gravels. The quantity of debitage recovered was very low, averaging two pieces per level (Anthony and Brown 2000:19-21). Site 41BP537 is a surficial twentieth-century historic dump that consists of seven items; no shovel tests were excavated at the site (Anthony and Brown 2000:21-23). Site 41BP538 is a buried prehistoric lithic scatter that was sampled by 27 shovel tests, 22 of which yielded artifacts. Six of the positive shovel tests were located along the centerline of an old Civilian Conservation Corps roadbed,

which in places was eroded as much as 1 m below the original ground surface. The cultural deposits extend to a depth of at least 70 cm below surface in deep sand with gravels. Shovel test data indicate that the site measured at least 300 m east-west by 200 m north-south, but the total extent of the site could not be determined in the time allowed (Anthony and Brown 2000:24-26). None of the sites were considered to merit formal designation as State Antiquities Landmarks because of their low density of artifacts, lack of time-diagnostic artifacts, and significant artificial impacts across much of the area (Anthony and Brown 2000:21, 23, 26). The wastewater lines were rerouted to a previously disturbed corridor along the paved park road to avoid sites 41BP536 and 41BP537, and Art Black recommended monitoring of trenching in the area of 41BP538 (Black 2000:29).

In December 2006, Mahoney (2007b) surveyed a 130 by 5 m area covering 0.16 acres, and slated for a waterline installation trench. He excavated two shovel tests that reached dense gravel deposits at a depth of 15 cm. No cultural materials were observed or recovered, and the project was allowed to proceed (Mahoney 2007b:11).

In March 2007, archeologists with SWCA Environmental Consultants conducted a pedestrian survey and shovel tested approximately 28 miles of 3 m-wide fire lanes (Wilcox et al. 2007). The survey covered 33.4 acres. In total, 349 shovel tests were excavated in 20 cm levels, averaging 62 cm deep and terminating at sterile basal gravels, clays, or at depths too difficult to dig. During the initial phase, 20 of the 180 shovel tests excavated in high probability areas produced cultural materials. Six of the 20 shovel tests yielded isolated finds. Areas around the remaining 14 positive shovel tests were delineated with 149 additional shovel tests, resulting in the recording of 13 sites (41BP822-41BP834). Testing also determined that 41BP15 and 41BP428 did not extend into the fire lanes (Wilcox et al. 2007:16).

Ten of the sites recorded in 2007 (41BP822-41BP827 and 41BP830-41BP833) are small prehistoric lithic scatters, two sites (41BP828 and 41BP829) are large prehistoric campsites, and one site (41BP834) is a historic structure remnant with an associated cistern (Wilcox et al. 2007:16). Site 41BP828 had the only fire-cracked rock feature, consisting of a lens of quartz/quartzite cobbles at 80 cm below surface (Wilcox et al. 2007:31-32). At site 41BP824, a Late Archaic Darl dart point was recovered from a shovel test at 40 to 60 cm below surface (Wilcox et al. 2007:25). Site 41BP828 yielded an untyped dart point fragment at 40 cm below surface (Wilcox et al. 2007:32). Five sites (41BP824, 41BP826, 41BP828, 41BP829, and 41BP834) were judged to have research potential, but further investigations were recommended to determine whether they merit official designation as State Antiquities Landmarks. Eight sites appeared to have low research potential due to their diffuse artifacts, lack of temporally diagnostic artifacts, lack of contextual integrity, and/or significant artificial impacts. Those sites (41BP822-41BP823, 41BP825, 41BP827, and 41BP830-41BP833) did not appear to merit official designation as State Antiquities Landmarks (Wilcox et al. 2007:48-49).

In October 2007, Mahoney conducted two small pedestrian surveys and shovel testing. One project was a proposed fire lane that was approximately 2.5 miles long and 5 m wide, covering 4.66 acres (Mahoney 2008a). Thirty-four shovel tests were excavated to sterile substrate or a depth of 50 cm, whichever was deeper. The other project encompassed approximately 2 acres that were to be impacted by construction of the Regional Office (Mahoney 2008b). The area was traversed in three transects, and six shovel tests were excavated to an average depth of 10 cm where they reached underlying dense gravels. No cultural materials were observed or recovered on either project; Mahoney recommended that the projects be allowed to proceed without further cultural resources investigations (Mahoney 2008a:38; 2008b:51-52).

In March 2008, Mahoney conducted a pedestrian survey of five pastures proposed for mechanical pine planting, encompassing approximately 82 acres (Mahoney 2009). Forty-two shovel tests were excavated to sterile substrate or 80 cm below surface, whichever was deeper. No cultural deposits or materials were encountered, and the project was allowed to proceed (Mahoney 2009:6).

In September 2008, Mahoney dug a shovel test on a site that he had been monitoring for several years, due to the abundance and variety of artifacts on the surface. A neighboring landowner had alerted him to its presence in 2005. Mahoney had collected artifacts from the surface of the site in the course of monitoring it for impacts from law enforcement trainings, prescribed fires, and excessive rainfall events. The test that was dug in 2008 was placed in the center of a dense concentration of artifacts on the surface. It yielded debitage and fire-cracked rocks from every 20 cm level to a depth of 100 cm, and charred nutshells were recovered between 40 and 60 cm below surface. The cultural deposit appeared to extend even deeper. Due to the large size of the site and high density of artifacts on the surface, Mahoney postponed its full recording until he could muster a multi-person crew to intensively survey and test it (Richard Mahoney, personal communication 2011). The site was fully recorded as 41BP882 during the current investigations.

In September 2010, Mahoney conducted a pedestrian survey of 0.19 acres for a proposed erosion abatement project. The small, sloping area had been completely denuded by long-term heavy pedestrian traffic by park visitors. The exposed sandstone bedrock precluded shovel testing, no cultural materials or features were observed, and no further investigations were recommended (Mahoney 2011:155).

In September 2011, TPWD archeologists conducted a pedestrian survey of 10 firebreaks that had been bulldozed to protect historic structures and park facilities during the Bastrop County Complex Fire (McNatt 2012). The survey covered 6.2 acres; the firebreaks ranged from less than 100 m to 430 m long, 4 to 40 m wide, and 5 to 150 cm deep. One previously recorded site (41BP538) and one newly recorded site (41BP870) were exposed in the firebreaks, as well as three isolated finds (McNatt 2012:6-7). Site 41BP538 is a lithic scatter on an upland slope with some exposed gravels. One shovel test was excavated in 2011 in an area with a high density of artifacts

that correlated to the part of the site where shovel tests had found high artifact densities in 1998 (Anthony and Brown 2000:24). This test recovered a Late Archaic Lange dart point between 0 and 20 cm below surface, a core from the 20 to 40 cm level, and 47 pieces of debitage from 0 to 80 cm below surface (McNatt 2012:6-7). Site 41BP870 is a lithic scatter west of Copperas Creek. Three shovel tests were excavated to help define the site boundaries: one shallow test in a gravel deposit and two deeper tests in sandy matrix. Artifacts recovered from one deep test include a possible mano fragment, a core, and 54 pieces of debitage, at depths from 0 to 95 cm below surface. Only two pieces of debitage were recovered from the other deep test, and the shallow test only extended to 40 cm below surface, with artifacts recovered between 0 and 20 cm below surface (McNatt 2012:7). The isolated finds include two bifacial core tools; use-wear analyses later indicated that they had been used for multiple purposes (Himes 2013:20-21). The research potential of 41BP538 and 41BP870 was considered to be moderately low. Neither site was recommended for official designation as a State Antiquities Landmark because they did not meet State Antiquities Landmark Archeological Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods). McNatt stated that they did not merit designation under State Antiquities Landmark Archeological Criterion 5 at that time because they were not susceptible to vandalism (McNatt 2012:8-9).

From February through June of 2012, archeologists from Hicks & Company surveyed 1,650 acres in Bastrop and Buescher State Parks. The survey in Bastrop State Park covered 1348.9 acres, consisting of a 1,000 acre area in the southeast part of the park, a number of fire lanes, and several small tracts in the north part of the park where pine trees would be planted. The crew visited nine previously recorded sites (41BP69, 41BP822, 41BP824-41BP826, 41BP828, 41BP833, 41BP834, and 41BP870) and recorded 25 new archeological sites (41BP883-41BP907). Due to discrepancies between the field notes, artifacts, and draft report (Haefner et al. 2012), the report has not been finalized to date.

In October 2015, TPWD archeologist Robin Barnes directed the survey of eight firebreaks that had been bulldozed to stop the Hidden Pines Fire. Firebreaks 6 and 7 were in Bastrop State Park, and covered ca. 3 acres. Firebreak 8 was on Park Road 1C. One of these firebreaks included previously recorded site 41BP879, which had been recorded in 2011 during the current investigations. Three Late Archaic dart points were collected from the surface of the site—two Darls and one possible Darl—and the site boundary was extended slightly to include them. A new site (41BP927) was discovered in another firebreak, consisting of a scatter of debitage exposed in the firebreak. A shovel test dug in an undisturbed area adjoining the firebreak produced up to four pieces of debitage per level to a depth of 90 cm below surface, yielded one piece of fire-cracked rock at a depth of 60 cm, and ended at a depth of 100 cm. Barnes concurred with the 2011 assessment that 41BP879 merited official designation as a State Antiquities Landmark because it meets State Antiquities Landmark Archeological Criterion 1 (potential to contain important information) and 5 (susceptibility to vandalism). She stated that 41BP927 did not merit official

designation as an State Antiquities Landmark because it did not meet Archeological Criteria 1 through 5 (Barnes 2016:43-45).

In February and March 2016, TPWD archeologists Luis Alvarado and Margaret Howard directed shovel testing at site 41BP261. Alvarado located the site while shovel testing areas that might be impacted during the stabilization of eroding slopes below two park facilities. He dug four shovel tests to bracket the site, and collected an Early Archaic Martindale dart point and a Middle Archaic Early Triangular dart point from the surface. He recovered a Late Archaic Pedernales dart point between 50 and 60 cm below surface in one of the tests. Howard and a crew of four dug 19 more tests to ascertain the extent, content, depth, and integrity of the cultural deposits; the total area that was tested covered ca. 1 acre. The shovel tests ranged from 20 cm to more than 100 cm deep across the site; four of the five tests ended at a depth of 100 cm due to difficulty of digging. Those tests produced the highest artifact densities at the site, ranging from 7 to 11 artifacts per level. Those four tests also yielded fire-cracked quartzite and sandstone. Howard and Alvarado concurred that the research potential of 41BP261 was moderately high, and recommended that the site merits official designation as an State Antiquities Landmark because it met State Antiquities Landmark Archeological Criteria 1 and 2: potential to contribute important information and integrity. The site also merits designation under State Antiquities Landmark Archeological Criterion 5 because it is susceptible to vandalism due to its proximity to park visitor pedestrian traffic (Alvarado 2016).

GEOMORPHIC CONTEXTS OF ARCHEOLOGICAL SITES IN THE SANDY MANTLE OF BASTROP COUNTY

Investigators of archeological sites in the mantle of sandy sediments that covers most of Bastrop County and a broad band across east Texas (Ahr et al. 2013:213) are confronted with questions concerning the nature and integrity of the buried cultural deposits, given the loosely consolidated and uniform nature of the deep, sandy soils. When the work plan for this project was designed several efforts (e.g., Lohse and Bousman 2006) had been made to ascertain whether the cultural deposits encompassed in this matrix retain sufficient integrity and research potential for future work to yield meaningful and reliable information. Since that time, a geomorphological investigation at Bastrop SP was conducted (Galan 2012) and additional methods for recognizing locations with intact buried cultural deposits in sandy mantle contexts were employed during a testing project at the Three Oaks Mine in Bastrop County, Texas (Frederick and Gregory 2016:91-111).

Two models of sandy mantle formation and cultural associations have been proposed based on archeological and geomorphological investigations. These are designated by Lohse and Bousman (2006:61-63) as the Bruseth-Martin position and the Frederick-Bateman position, after their main proponents. The Bruseth-Martin position (Bruseth and Martin 2001) states that the sandy mantle is a non-aggrading formation developed long ago through weathering of the underlying sandstone bedrock. The sediments are highly bioturbated to depths of 100 to 150 cm,

and artifacts that initially were deposited on the stable land surfaces have worked downward as a result of bioturbation. Any apparent correlation of independent lines of evidence on stratigraphy such as time-diagnostic artifacts and radiocarbon dates is due to systematic translocation of all materials down-profile (Lohse and Bousman 2006:61-62).

The Frederick-Bateman position (Frederick and Bateman 2001) suggests that there is no single model of landform formation within the sandy mantle, due to the high degree of variability in ancient and modern gullies and preserved fragments of buried soils. Landforms across the sandy mantle can be static and non-aggrading or dynamic and aggrading, depending on their context. Discerning the geomorphic context of each site is essential in order to assess its capacity for preserving distinguishable cultural components. Transitional slope settings such as sideslopes, footslopes, and elevated terraces are places where aggradation is likely, due to colluvial and even eolian processes. These settings hold the highest potential for the preservation of intact, stratified sites (Lohse and Bousman 2006:62-63, 65).

The Center for Archeological Studies at Texas State University conducted a trial of an inexpensive method to assess the significance of archeological sites in the sandy mantle at Camp Swift in October of 2005 (Lohse and Bousman 2006:1). Deeply buried cultural materials had been identified during previous investigations at eight sites. Backhoe trenches were excavated in them to document their stratigraphic profiles and locate buried fire-cracked rock features. The matrix in the trenches was removed in 10 to 20 cm levels and examined for artifacts but was not screened. When features were noted, trench excavation would cease so that they could be recorded. Trench floors and walls also were examined to locate artifacts and features (Lohse and Bousman 2006:19). Stratigraphic profiles were recorded and described. The geomorphic contexts of the sites were evaluated by determining the thickness of sandy sediments, the presence and depth of artifacts and features, and the age of the occupations based on time-diagnostic artifacts and radiocarbon assays (Lohse and Bousman 2006:59).

Five buried features were discovered at two of the sites at depths of 35 to 90 cm below surface, and fire-cracked rocks were recovered at several sites at depths up to 200 cm (Lohse and Bousman 2006:65). Thirteen radiocarbon dates were obtained from seven sites, with one date from the Early Archaic period and the remaining dates falling in the Late Archaic or Late Prehistoric periods. Lohse and Bousman (2006:66-68) considered those findings in light of a study of temporally diagnostic artifacts and radiocarbon dates from Camp Swift that was later published by Nickels (Nickels et al. 2010:370-374). The combined body of data revealed very little evidence of human presence during the Early and Middle Archaic periods. Along with the recovery of late Paleoindian and Early Archaic artifacts on the surfaces of a few sites, the data were taken as possible evidence that the widespread eolian erosion and sedimentation that occurred on the Southern High Plains from 7050 B.C. to as late as 2550 B.C. (Holliday 1989) had also affected the Camp Swift area, causing sites to be eroded away (Lohse and Bousman 2006:66-68).

The findings of the 2005 investigations at Camp Swift suggest that explanations of site contexts and landform formation in the sandy mantle of Bastrop County are not uniform; confounding factors include intrusive pits, within-site depositional variation, cultural components that do not extend across entire sites, and reuse of older artifacts (Lohse and Bousman 2006:70-71). To assess the significance of archeological sites in the sandy mantle of this area, Lohse and Bousman (2006:64) concluded that researchers need to apply multiple chronometric approaches at sites that appear to have stratified cultural deposits, including identification of time-diagnostic artifacts, radiocarbon assays, and optically stimulated luminescence dating of single quartz sand grains.

The geomorphological investigation at Bastrop SP (Galan 2012 draft report) included the documentation of surface features by visual inspection, a review of shovel test data, and excavation unit and backhoe trench profiles. Galan (2012) concluded that much of the uplands consist of sands and clay deposited between 50 and 55 million years ago. These deposits have been heavily eroded over the past several million years. Pockets of more recently deposited eolian and colluvial sediments may contain intact buried cultural deposits while buried cultural materials found in the much more widespread in situ Eocene sandy mantle are the result of bioturbation. Toe slopes and interfluves were noted as areas with a higher potential for preservation of buried archeological sites at Bastrop SP. In addition, buried soils were recorded in backhoe trenches in the Alum Creek drainage. These soils have not yet been dated so it is unknown if any of the soils are of Holocene age. The other four drainage basins within the park (Copperas Creek, Little Alum Creek, an unnamed drainage, and Dry Creek) are relatively young, deeply dissected drainages with steep slopes that have little room for terrace building and therefore, a low probability of buried cultural deposits.

More recently Frederick and Gregory (2016) conducted testing at 41BP595 in order determine whether an organic-rich deposit is cultural in origin as well as the age of the feature. One hundred and two samples were collected from two backhoe trenches and two sample columns. These samples were used to conduct magnetic susceptibility, particle size distribution, and loss-on-ignition studies. These studies in conjunction with geomorphological observations led to the conclusion that the organic-rich deposit is of cultural origin. Site 41BP595 is in an upland setting near the crest of a hill. The original feature was located in an ancient gully later filled by eolian sand.

The work plan for the post-fire salvage project at Bastrop SP relied on surface expression of archeological sites with limited shovel testing. Subsurface investigations to date have not been extensive enough to determine whether or not buried artifacts found in sand during shovel testing indicate the presence of intact buried deposits with high research potential.

4. METHODS OF ARCHEOLOGICAL INVESTIGATIONS

by Margaret Howard

The primary goals of the 2011 surveys in Bastrop State Park were to identify the archeological sites in areas slated for timber harvest and hazard tree removal after the Bastrop County Complex Fire, to evaluate the 12 sites recorded during the surveys, and to evaluate the management priority of these sites. This section explains how the methods of the current investigations were designed to achieve these goals.

DATA COLLECTION STRATEGY

Information on prehistoric chronology can be obtained from stratified cultural deposits where artifact assemblages can be clearly associated with temporally diagnostic artifacts and datable materials. Shovel testing was used to ascertain the presence, depth, density, and age of the cultural deposits in the 12 newly recorded sites, and to obtain datable artifacts and materials. Temporally diagnostic artifacts from previous investigations in the park were examined.

SURVEY METHODS

The Texas Parks & Wildlife Department (TPWD) Archeology Survey Team conducted two investigations under Texas Antiquities Permit 6069: a survey of six timber harvest units that covered 1,296.0 acres, and a survey of 10.8 miles of road corridors that covered 303.5 acres. The two surveys overlapped in some areas, and the combined area surveyed totaled 1,573.2 acres, comprising 23 percent of the 6,716.7 acre Bastrop State Park. The combined projects constitute the largest archeological survey that has been conducted in the park to date.

The Team was called to Bastrop State Park on October 17, 2011 to conduct an intensive survey of six units slated for the harvest of timber burned in the massive Bastrop County Complex Fire the month before. The archeologists mobilized quickly to stay ahead of the anticipated logging operation, which was slated to begin on October 18, before the timber dried out and became less marketable. On the day that the Texas Antiquities Permit was issued, the crew of 10 archeologists began surveying the six units slated for timber harvest, in the order that they were to be logged. The survey was completed in seven days by a crew of 4 to 10 persons, on October 17-22 and 24, 2011. Seventy person-days were expended in the timber harvest unit survey, at an average rate of 18.5 acres surveyed per person-day. The acreage per person-day was higher than average because shovel testing was not conducted during this phase of work.

The timber harvest unit survey was guided by Principal Investigator Margaret Howard and directed by Project Archeologist Luis Alvarado, assisted by crew members Logan McNatt, Joshua Gibbs, Aina Dodge, Marni Francell, and Toni Fischer. Four other TPWD archeologists also served as crew members: Region 6 Cultural Resources Coordinator Rich Mahoney, Region 2 Cultural Resources Coordinator Kent Hicks, Region 4 Cultural Resources Coordinator Ruth Mathews, and

Region 3 Cultural Resources Coordinator Diane Dismukes. Texas Historical Commission archeologists Mark Denton and Jeff Durst also worked with the crew on several days.

The six timber harvest units were irregularly shaped (Figures 4-1, 4-2, and 4-3), and ranged from 22 acres to 367 acres (Table 4-1). In order to cover them effectively, additional areas outside the units were surveyed in some cases. A total of 1,296.0 acres were surveyed in and near the timber harvest units.

Table 4-1. Survey Unit Sizes and Recorded Sites.

Survey Unit	Size	Newly recorded sites
Timber Harvest Unit 1	165 acres	41BP871
Timber Harvest Unit 2	367 acres	41BP872, 41BP873
Timber Harvest Unit 3	312 acres	41BP875
Timber Harvest Unit 4	241 acres	41BP876, 41BP880*
Timber Harvest Unit 5	190 acres	41BP877*
Timber Harvest Unit 6	22 acres	41BP874
Park Road 1A corridor	2.3 miles	41BP877*, 41BP878, 41BP881
Park Road 1C corridor	6.2 miles	41BP879
Gotier Trace corridor	1.4 miles	41BP880*
Harmon Road corridor	0.9 miles	-

*Sites in timber harvest units and road corridors.

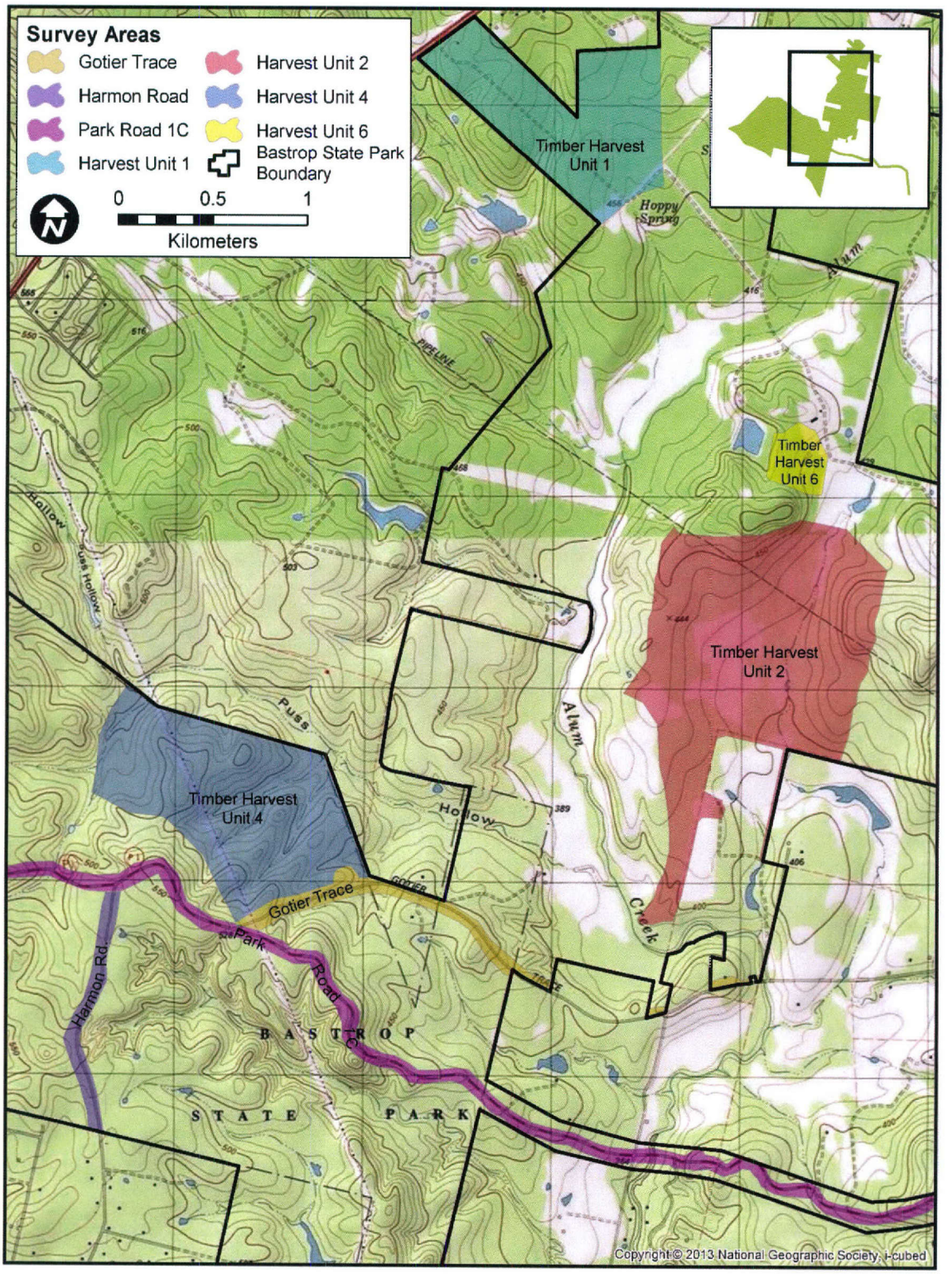

Figure 4-1. Timber Harvest Units 1, 2, 4, and 6, and Park Road 1C, Harmon Road, and Gotier Trace survey corridors.

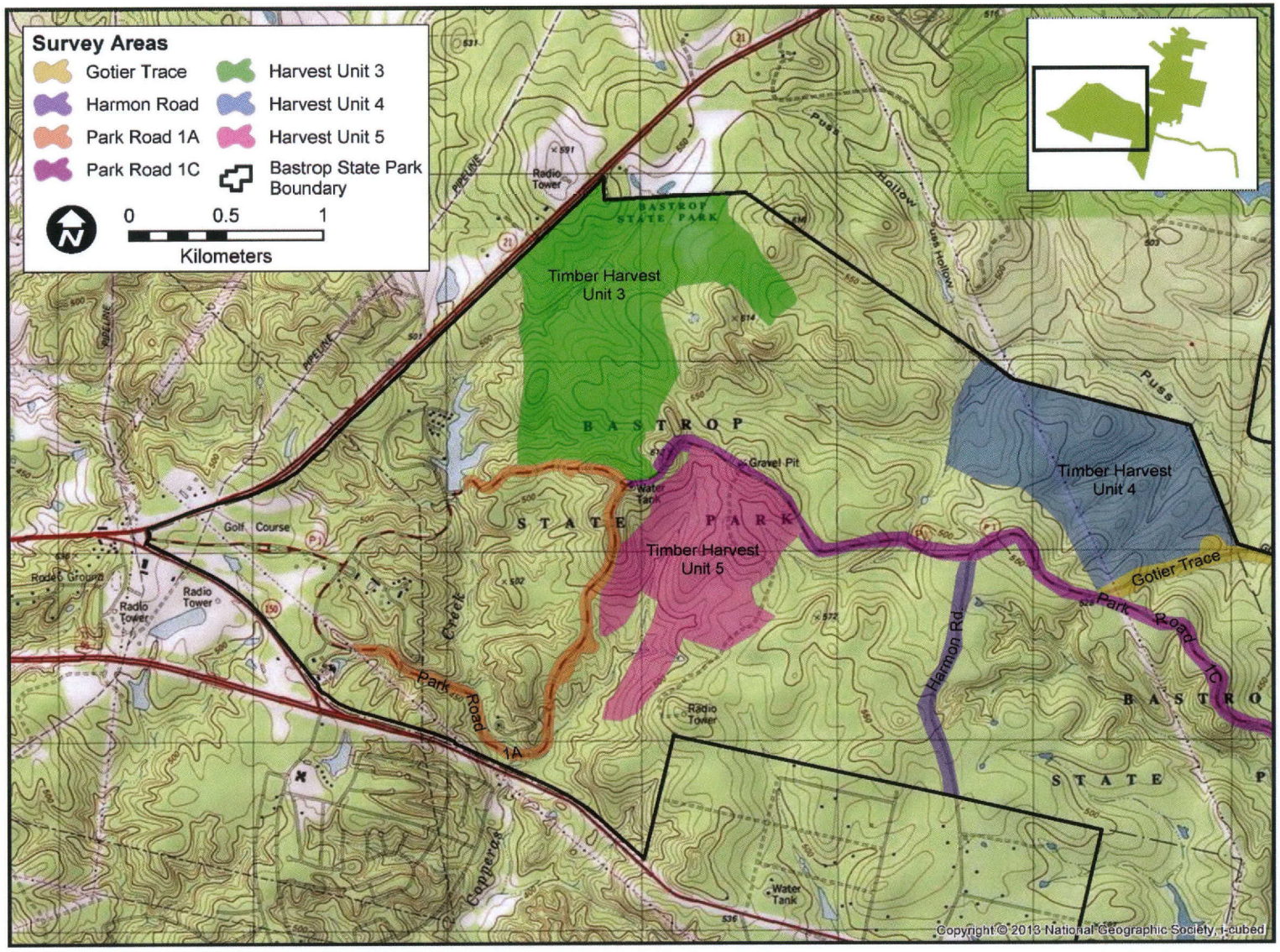

Figure 4-2. Timber Harvest Units 3, 4, and 5, and Park Road 1A survey corridor.

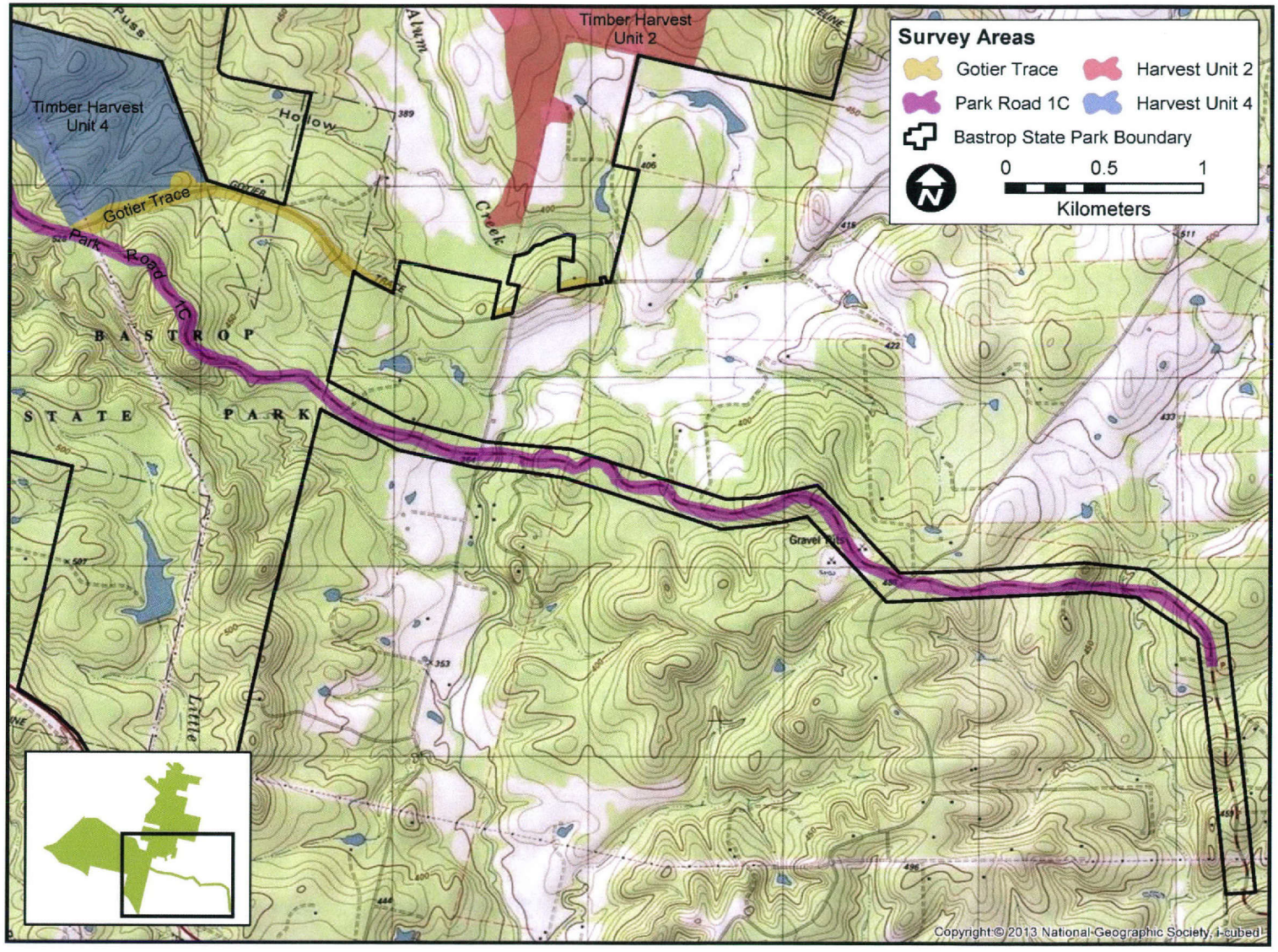

Figure 4-3. East end of Park Road 1C survey corridor.

The crew followed the safety protocols established for all personnel in areas of Bastrop State Park that had burned during the wildfire. They wore hard hats and safety vests, and stayed at least 400 yards away from logging operations. Conditions varied within and among the units due to the intensity of the fire; they had been mapped by TPWD Timber Manager Greg Creacy and ranked in terms of the U.S. Department of Interior burn severity rating system (Lost Pines Recovery Team 2011:5-10). In scorched areas, the dead plant material on the ground (primarily pine needles and oak leaves) was partially consumed. In lightly burned areas, 75 percent of the ground litter was consumed. In moderately to heavily burned areas the ground litter was mostly to entirely consumed (U.S. Department of Interior, National Park Service 2003:109-110).

Because the wildfire had consumed the plant materials on the ground and recent rains had washed the ash away, ground surface visibility in Bastrop State Park ranged from 30 percent up to 100 percent (e.g., Figure 4-4). It was anticipated that sites would be evident on the ground surface, because the 150+ positive shovel tests dug during previous investigations in the park had almost always encountered artifacts in the first 10 cm of soil excavated. Crew members walked transects spaced at intervals of 30 m or less, and identified all visible archeological sites and historic features like road traces and structures built by the Civilian Conservation Corps (CCC). Persons on the outermost transects recorded the extent of the areas surveyed using Global Positioning System (GPS) units or by marking their paths on field maps

Figure 4-4. Two members of crew surveying heavily burned timber harvest unit.

In November of 2011, another survey was conducted in a 200 ft wide corridor totaling 10.8 miles along Park Roads 1A and 1C, Harmon Road, and Gotier Trace. The burned timber along

those roads was slated to be removed because falling trees would constitute a hazard to road traffic. Crew members were positioned at distances of 10 m and 30 m from both sides of the paved roadways and walked transects spaced at 20 m intervals. Persons on the outermost transects recorded the extent of the areas surveyed using GPS units or by marking their paths on field maps. Diane Dismukes, Margaret Howard, and Logan McNatt served as Project Archeologists for the road corridor survey, and the crew members were Toni Fischer, Aina Dodge, Joshua Gibbs, Marni Francell, Rich Mahoney, and Ruth Mathews. The survey proceeded at an average rate of 2.7 miles per day and was completed in four days by two four-person crews, on November 3-5 and 7, 2011. Twenty-one person-days were expended in the road corridor survey, which covered 303.5 acres at an average rate of 14.5 acres per person-day.

During the timber harvest unit and road corridor surveys, areas within the park were defined as sites when, on intensive examination, they contained more than three artifacts within a 10 m diameter area. When several areas achieving these artifact densities and/or containing cultural features were in fairly close proximity but were separated by areas with more diffuse cultural deposits, they were combined and considered to be one site.

Archeological site boundaries were defined by the extent of artifacts visible on the surface, as determined through intensive examination. Ground surface visibility at the time of the surveys ranged from 30 percent to 100 percent (see Figure 4-4). Archeological sites in Bastrop State Park had never been seen under these conditions before. Previous investigations in the park were conducted under conditions of minimal ground surface visibility, and had used shovel testing to determine site extent, which is standard practice in areas where less than 30 percent of the ground surface is visible, according to the Council of Texas Archeologists Archeological Survey Standards for Texas.

To protect the 12 newly recorded and previously recorded archeological sites in the survey areas (see Table 4-1) from damage during logging operations, each site was surrounded by a buffer zone ranging from 50 to 100 ft, depending on the terrain and proximity to survey unit boundaries. Buffer zones were marked by painting distinctive marks on tree trunks. Buffer zones also were marked around CCC features so that they would not be damaged during logging operations. TPWD archeologists recorded the locations of archeological sites and buffer zones using GPS units. Due to time constraints, brief notes were made on the content and apparent significance of the sites, but they were not fully recorded during the surveys.

Field numbers were assigned to the sites and isolated features/artifacts discovered during the surveys, consisting of the last two digits of the calendar year when the project was initiated (11-), a sequential number in the list of sites and isolated finds discovered (three digits with leading zeros), and a two-letter abbreviation for Bastrop State Park (BS). Two-digit sub-location numbers were assigned sequentially to artifacts collected and cultural features within each site. For example, the second artifact collected on the thirteenth site/isolated find discovered in 2011 was assigned field number 11-013BS, sub-location 02.

Artifacts were collected from the surface of sites when they were judged likely to yield important information on age, cultural affiliation, and/or the research aims of these investigations. All projectile points were collected. Manos and mano fragments were collected so that their identity could be confirmed through analysis, due to their resemblance to the unmodified quartzite pebbles that are abundant in some areas of the park (see Environmental Background). Rare artifacts, potentially nonlocal items, and artifacts at risk of loss were also collected. Collection of historic artifacts was limited to items that could not be adequately documented in field notes. A few chipped stone tools were collected due to their distinctive attributes. GPS readings were taken on the locations of all artifacts collected.

Due to the need to rapidly identify, buffer, and mark cultural resources in areas slated for logging, the newly discovered archeological sites were not fully recorded during the first phase of the timber harvest unit and road corridor surveys. Crews returned to Bastrop State Park to record those 11 sites over five days: December 12, 14, and 15, 2011, and January 11 and 12, 2012. Those records and shapefiles were submitted to the Texas Archeological Research Laboratory of The University of Texas at Austin and the sites received the trinomial designations of 41BP870-41BP881. A known but unrecorded site outside the survey areas (41BP882) was also recorded during this phase of the investigations. After the sites were recorded, the distinctive marks on trees that had indicated their buffer zones were painted over. Margaret Howard directed the site recording phase of the investigations, which was carried out by crews of three to eight persons. Crew members were Logan McNatt, Luis Alvarado, Joshua Gibbs, Toni Fischer, Aina Dodge, Stephen Garrett, Marni Francell, and Rich Mahoney. A total of 26 person-days were expended in recording the 12 sites, with an average of 2.2 person-days spent at each site.

Four previously recorded sites fall wholly or partially within the 2011 survey areas. The records for 41BP428 were updated during the analysis phase using the existing records and GPS data. Three other sites that extend into the 2011 survey areas—41BP823, 41BP831, and 41BP834—had been recorded and tested in 2007 (Wilcox et al. 2007), and their records were not updated.

The sites were recorded on standardized TexSite compatible forms. The photographs that were taken included general views of each site, features encountered on the surface, and a limited number of natural context images. Cultural material characterizations included quantities and types of prehistoric stone tools present on each site, as an indication of assemblage diversity. Lithic raw material types were not recorded unless they were atypical, or indicated use of a particular source area. Historic artifact scatters were documented by listing the artifact types on universal data forms, focusing on items that might indicate the age and function of the site. Inscriptions and makers' marks that could be identified to date and/or source also were recorded.

One or more shovel tests were dug at each site to ascertain the depth, stratigraphy, density, and integrity of the cultural deposits, and to assess their research potential. A review of the 150+ positive shovel tests dug in the park prior to 2011 indicated that tests in cultural deposits that were

deemed to have a high information yield potential had produced an average of at least 5 artifacts per level, had relatively high artifact counts in levels below 20 cm, produced fire-cracked sandstone or quartzite, and/or hit fire-cracked rock features. The purpose of shovel testing conducted during the current investigations was to determine whether the cultural deposits at the new sites had one or more of these attributes. This methodology was developed to quickly access sites following a natural disaster and prior to salvage operations. While all sites were marked for avoidance during the salvage operations, it is in the future interests of TPWD to determine site research potential to guide future development at Bastrop State Park. Limited shovel testing was conducted as a method for determining research potential for sites in sandy mantle deposits where it is difficult to determine whether buried deposits are intact. The 2011 shovel testing strategy confirmed the presence of buried archeological deposits but was not, by current standards, comprehensive enough to verify the integrity of the buried deposits.

The first shovel test at each site was placed in the area that had the highest surface artifact density, or in the approximate center of the site. If that shovel test revealed that the cultural deposit had one or more of the attributes indicating that it had a high information yield potential (above), it was considered sufficient to confirm the presence of buried archeological deposits and no more tests were dug. When the first shovel test dug on a site had none of those attributes and/or hit bedrock at a depth of 40 cm or less, additional tests were dug to determine whether cultural deposits with higher information yield potential were present at the site. Multiple shovel tests were also dug in sites covering more than 2 acres. In 2017, additional shovel tests were excavated at three sites located along Park Road 1A due to potential road construction. In total 43 shovel tests were excavated at the 12 sites.

Shovel tests were rectangular and typically measured 25 by 40 cm; the matrix was removed in 20 cm levels and screened through ¼ inch mesh hardware cloth. Tests were terminated when they reached dense clay subsoils or were too deep for sediments to be removed by tool or hand, typically at around 100 cm below surface. Tin caps or other modern items were placed in the bottom of shovel tests before they were backfilled. The depths of the artifacts recovered from shovel tests in sandy sediments like those in Bastrop State Park are somewhat imprecise, because items may be inadvertently knocked down into lower levels during excavation. To minimize this problem, shovel testing generally was conducted when the sediments were moist and less likely to slump. The location of each test was recorded with a GPS unit, and tests were numbered sequentially within sites.

All of the prehistoric and historic artifacts encountered in shovel tests were collected with the exception of three types of items, which were returned to the screened matrix and backfilled into completed tests, or discarded. Due to the prevalence of wildfires in this area over the centuries, many of the gravels in outcrops on the surface have been altered by heat. Fire-cracked rocks were considered likely to be of human origin when they consisted of quartzite or sandstone, which fracture at high temperatures like those in hearths that were used repeatedly. Due to their probable cultural origin, fire-cracked sandstone and quartzite rocks were collected.

Fire-cracked chert is ubiquitous in the park and likely is of natural origin because this siliceous rock fractures at relatively low temperatures. Due to the abundance of fire-cracked chert from the recent wildfire (and probably earlier ones) and the fact that some of the spalls resemble debitage (Figure 4-5), the following criteria were employed to distinguish fire-cracked chert from chipped stone debitage. Specimens were classified as naturally fire-cracked chert when they had parallel non-faceted curving surfaces with blocky edges, perfectly flat surfaces, and/or contorted curved surfaces. Almost all very small chert fragments with pot-lid fractures were classified as fire-cracked chert. Specimens were classified as debitage when they had features that clearly evidenced human flint-knapping, i.e., platforms, bulbs of percussion, ripple marks, smooth ventral and faceted dorsal surfaces, and/or feathered terminations, even if they showed evidence of having been burned.

Figure 4-5. Chert cobble burned in wildfire, with natural spall facets.

Artifacts recovered from shovel tests were counted in the field and their quantity was recorded on shovel test forms. The stratigraphy encountered in shovel tests was recorded on those forms, and Munsell color readings (Munsell Color Company 2000) were taken on each sedimentary unit identified in shovel test profiles.

Natural and modern items lacking historical, cultural, or scientific value were not collected from shovel tests. Objects that had decayed or decomposed beyond reasonable use and repair or that by their condition constituted a hazard to other objects were not collected. Charcoal from the wildfire or modern campfires and other materials of recent origin like pull tabs, crown caps, and cigarette butts were noted on shovel test forms and then discarded.

Several types of artifacts and features were recorded as isolated finds. Their locations were recorded with GPS units and they were briefly described in GPS log books, but they were not recorded as sites. Isolated finds were defined as:

- CCC features including retaining walls, culverts, latrine foundation slabs, and erosion control features;
- isolated historic features (e.g., dumps, road traces, and drilling sites) that lacked features or artifacts indicative of habitation;
- historic fence lines not on USGS maps;
- rock cairns, particularly those that might be historic survey markers;
- lithic procurement areas with artifact densities below the threshold for site designation;
- single, isolated prehistoric or historic time-diagnostic artifacts, even if collected;
- features of uncertain age (e.g., isolated hearths) with few or no associated artifacts; and
- dumps of materials that postdate the opening of the park in 1937.

Cultural features and dumps that appeared to be less than 50 years old were not recorded as sites or isolated finds unless they were thought to be of exceptional importance to the history of Bastrop State Park. Modern features within sites that were indicative of site disturbance, e.g., uncontrolled excavations, were mapped as sub-locations.

INCLUSION OF OTHER COLLECTIONS FROM BASTROP STATE PARK

Since the conclusion of this investigation additional artifacts have been collected at five of the 12 sites. These include an arrow point collected from the surface of site 41BP879 during a cultural resources training, a biface collected from the surface of site 41BP882 during a site revisit, and debitage collected from additional shovel testing at sites 41BP877, 41BP878, and 41BP881.

5. SITE DESCRIPTIONS

by John Lowe and Logan McNatt

Twelve archeological sites were recorded during the current investigations; ten are prehistoric and two are historic with prehistoric components (Table 5-1). Seven of the prehistoric sites are open campsites (41BP871, 41BP875, 41BP876, 41BP878, 41BP880, 41BP881, and 41BP882), identified by the presence of fire-cracked rocks, fire-cracked rock features, and/or ground stone tools, all indicative of longer term occupations. Three prehistoric sites are lithic scatters (41BP872, 41BP877, and 41BP879), and were places where the primary activity was flintknapping, as evidenced by assemblages consisting primarily of chipped stone debitage and cores, with few tools. Two prehistoric sites are lithic procurement sites (41BP873 and 41BP874), and are associated with the Uvalde Gravel outcrops that top many hills in the park. They represent a limited range of activities, have artifact assemblages dominated by cores, tested cobbles, and cortical flakes, and rarely contain temporally diagnostic artifacts or other datable materials. The historic sites (41BP872 and 41BP873) are a homestead and a dump, respectively. The archeological sites at Bastrop State Park have potential to contribute significant data relevant to prehistoric chronology and settlement patterning in the Lost Pines region, historic settlement and land use, and site formation processes in the sandy mantle formation.

The five archeological criteria for official State Antiquities Landmark designation were used to evaluate each site: potential to contribute important information, integrity of the site, presence of unique attributes, opportunity to test new research methods, and susceptibility to vandalism. A number of attributes were considered to determine the uniqueness of each site and its potential to yield important information. Among them were presence of temporally diagnostic artifacts, tool diversity, surface and subsurface artifact density, presence of fire-cracked rocks and/or thermal features, presence of unique artifacts, and geomorphic context. For historic sites, an additional consideration was association with the early twentieth century community of Yewpon (see Appendix A). In addition, sites were evaluated for eligibility for listing on the National Register of Historic Places under the archeologically applicable criteria: history of yielding or likelihood of yielding information important in prehistory or history.

The western part of Bastrop State Park, consisting of the original 2,054-acre park area, was designated as a National Historic Landmark on September 25, 1997. The significance of the landmark is its association with the Civilian Conservation Corps and the work of Herbert Maier as the regional director responsible for the park design (Newlan et al. 1997:23). The nomination states explicitly that "no archeological resources have been considered in this survey" (Newlan et al. 1997:5), indicating that archeological sites within the boundary of the National Historic Landmark are not considered to be contributing resources. Four of the sites recorded during the current investigations—41BP875, 41BP877, 41BP878, and 41BP881—fall within the boundary of the National Historic Landmark but are not considered to be contributing resources.

Table 5-1. Site Attributes.

Site #	Acres	Prehistoric unspecified	Late Paleo- indian	Archaic	Late Prehistoric	Historic	Positive Shovel Tests	Prehistoric Artifacts from Shovel Tests	Projectile Points	Bifaces	Unifaces	Cores	Tested Cobbles	Manos	Fire-cracked rock	Gravels on/near
41BP871	0.6	-	-	-	X	-	2	29	1	-	-	-	-	-	X	-
41BP872	1.7	X	-	-	-	X	1	1	-	-	-	-	-	-	-	-
41BP873	2.3	X	-	-	-	X	1	1	-	X	-	X	X	-	-	-
41BP874	0.3	X	-	-	-	-	2	16	-	-	-	X	X	-	-	X
41BP875	2.6	X	-	-	-	-	2	117	-	-	X	X	-	X	X	X
41BP876	0.4	-	-	X	-	-	2	24	1	X	-	-	-	-	-	X
41BP877	2.6	-	-	Late	-	-	7	70	1	X	-	X	-	-	-	X
41BP878	1.0	X	-	-	-	-	9	88	-	-	-	X	-	X	-	-
41BP879	1.7	-	X	Late	X	-	2	33	4	X	-	X	-	-	-	-
41BP880	0.9	-	-	-	X	-	1	19	1	X	-	X	-	X	X*	-
41BP881	0.8	-	-	-	X	-	6	149	1	X	-	X	-	X	-	X
41BP882	17.5	-	X	Early Middle Late	X	-	3	189	16	X	X	X	X	X	X	X
Total		5	2	4	5	2										
Percent		12%	5%	10%	12%	5%										

* Fire-cracked rock feature

41BP871

This Late Prehistoric open campsite is located on a level bench on the southeast side of a hill, 100 m from an unnamed spring. The site measures 70 m northeast-southwest by 50 m northwest-southeast and encompasses 0.6 acres. Soil within the site is mapped as Padina fine sand, 1 to 12 percent slopes (Soil Survey Staff 2019). This soil occurs on the summits and backslopes of ridges and formed from weathered sandstone of Eocene age. A typical soil profile includes up to 1.5 m of fine sand overlying a sandy clay loam B horizon. At the time the site was recorded, vegetation consisted of a few scattered clumps of trees with no ground cover as a result of the September 2011 wildfire; consequently, 100 percent of the ground surface was visible during the survey. Site 41BP871 has been impacted by the wildfire, logging, and bioturbation, including extensive rodent burrowing.

Survey Results

The site boundary was defined by a sparse surface scatter, including debitage, many small tertiary flakes, several possible use-modified flakes, a Scallorn projectile point fragment, and occasional fire-cracked rocks. Within this distribution, two shovel tests were excavated in areas of relatively high surface artifact density. Shovel Test 1 was placed in the northeast part of the site near where the projectile point was found, and Shovel Test 2 was situated near the south edge of the site. Both were excavated to a depth of 100 cm below surface in very fine sand, and both yielded one to six pieces of debitage in every 20 cm level. The shovel tests were terminated without reaching bedrock due to the difficulty of digging deeper.

Materials Recovered

The 30 artifacts collected from site 41BP871 consist of 29 pieces of debitage and one Scallorn projectile point fragment. Scallorn projectile points date to the early Late Prehistoric period, with radiocarbon dates ranging from A.D. 700 to 1150 (Turner et al. 2011:209). The debitage consists of 11 complete flakes, 11 flake fragments, four pieces of angular debris, and three proximal flake fragments. Based on amounts of dorsal cortex, eight of the eleven complete flakes are tertiary, while the other three are secondary; all but one are less than 44 mm in maximum dimension.

Summary and Assessment

Site 41BP871 is an open campsite that contains an early Late Prehistoric period component and cultural deposits at least 100 cm deep. The site is situated on a level bench on the slope of a hill, a landform that may have been moderately aggrading during site formation. Given the relatively deep deposits, one temporally diagnostic artifact, and moderate artifact diversity and density, the site has potential for further research. The site also has potential for exploring site formation processes in the sandy mantle formation.

Site 41BP871 is recommended for official designation as a State Antiquities Landmark because it meets State Antiquities Landmark Archeological Criteria 1 (potential to contribute important information) and as eligible for listing on the National Register of Historic Places because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history). Although it is close to a road, it does not merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is not susceptible to vandalism. Vegetation growth has obscured surface visibility and this area is not open to the public.

41BP872

This historic twentieth century homestead and prehistoric lithic scatter is located on a knoll above a gentle slope, 110 m from an intermittent tributary of Alum Creek. The site measures 110 m north-south by 80 m east-west, and encompasses 1.7 acres. Soils within the site are mapped as the Robco-Tanglewood complex, 1 to 5 percent slopes (Soil Survey Staff 2019). These soils occur on the toeslopes and footslopes of ridges and formed from weathered sandstone, claystone, and shale of Eocene age. A typical soil profile includes up to 66 cm of loamy fine sand overlying a sandy clay loam B horizon.

A dirt road that runs through the site appears to be old based on the presence of deep, well-worn ruts. The east two-thirds of the site is on a formerly plowed field that supports a cover of low grasses and forbs. The west third is in a dense juniper-hardwood forest with a brushy understory. Natural impacts to the site include bioturbation, mostly from extensive rodent burrowing in the plowed field, and light burning during the September 2011 wildfire. Artificial impacts include a dirt road, barbed wire fences, and plowing. Approximately 90 percent of the ground surface was visible during the survey.

Survey Results

The boundary of the historic component was defined by a surface scatter of mostly domestic artifacts (tin cans, vessel glass, and ceramics) with some building materials (wire nails and window glass). Vessel glass consists of bottle bases dating to 1929 and 1934, a solarized medicine bottle, two clear glass liquor bottles dating between 1933 and 1964, and milk, aqua, dark brown, and light green glass. Ceramics are porcelain, transferware, a repoussé plate fragment, stoneware, and undecorated whiteware sherds. The historic artifact scatter extends from the wooded area into the open field, where artifacts are small fragments likely broken by repeated plowing. A kerosene car lamp and a decal-decorated gilt rim ceramic sherd were collected from the surface. The boundary of the prehistoric component was defined by debitage widely scattered across the surface of the west part of the site.

Shovel Test 1 was excavated near the west edge of the field and yielded 11 historic artifacts (vessel glass, flat glass, and wire nails) between 0 and 60 cm below surface, and one piece of debitage between 0 and 20 cm below surface. No artifacts were recovered below 60 cm below

surface. Sediments consisted of loamy fine sand with increasing clay content below 60 cm below surface; the test was terminated at 100 cm without reaching bedrock due to difficulty of digging.

Materials Recovered

The 14 artifacts collected from site 41BP872 consist of five clear shaped-glass fragments, three white earthenware sherds, three wire nails and fragments, one clear flat glass fragment, and most of a kerosene auto side lamp. A single piece of debitage is the only prehistoric artifact collected. A decorated whiteware sherd is decalcomania style, a common decorative technique beginning around 1890, which was most popular in Texas in the late nineteenth and early twentieth centuries (Majewski and O'Brien 1987:146-147; Miller et al. 2000:13; Moir 1988:257, 260). One of the clear, shaped-glass fragments is slightly solarized, suggesting it may have been decolored with manganese, thus dating it between 1880 and 1916 (Munsey 1970:55). Another is a piece of lamp chimney glass, suggesting that the occupation predated rural electrification. The flat glass fragment is window glass that might date between 1873 and 1885 based on its thickness (Moir 1987:80-81), although a single piece is not an adequate sample.

The three wire nails probably date to the twentieth century; wire nail production started in the 1860s, but they did not dominate the market until the 1890s, after which time they became ubiquitous (Nelson 1968:9-10). The kerosene lamp is a side lamp for the Ford Model T, and dates between 1916 and 1926 based on the shape and lack of brass trim (Model T Ford Club of America 2016). The remaining historic artifacts are not temporally diagnostic. Two of the clear glass pieces may be recent; they were recovered from the first level of one of the shovel tests and lack patina, while the clear glass from lower levels is patinated. The single piece of debitage is a complete tertiary flake that measures between 25 and 44 mm in maximum dimension.

History

Site 41BP872, along with 41BP873 and previously recorded site 41BP834, are in the general area where the Yewpon community was established in the early twentieth century (see Appendix A). A structure appears in the eastern, plowed part of the site on 1938 and 1951 aerial photographs (Figure 5-1), but is no longer present on the 1964 aerial. Two structures are plotted on the 1948 Smithville USGS topographic map near the area that is now the site, and they adjoin an unimproved road that runs north from Gotier Trace. Unimproved roads connect the three sites.

John Hierholzer purchased the property that includes 41BP872 from the Kohler estate in 1898 (Bastrop County Deed Record 29:142-144), and held it through 1920, when it was in the Yewpon community. He then sold it to Joe E. Smith, who kept it through 1950. The structure on the 1938 and 1951 aerial photographs was present during Smith's ownership of the tract.

Summary and Assessment

Site 41BP872 is a multicomponent site that consists of an early- to mid-twentieth-century homestead and a prehistoric lithic scatter. Its historic cultural deposits are 60 cm deep and its prehistoric cultural deposits are 20 cm deep. The deposits in the east part of the site have been significantly impacted by plowing and rodent burrowing. Cultural deposits in the west part of the site may be less disturbed. The research potential of the historic component is considered to be relatively high due to its apparent association with the Yewpon community. The prehistoric component has less research potential given the shallow, non-aggrading geomorphic context and low density of artifacts. The probability of buried prehistoric cultural materials in a primary context in this setting is low, and the potential for artifacts of different ages to have been deposited on or near the same prehistoric surface is high.

Site 41BP872 is recommended for official designation as a State Antiquities Landmark because the historic component meets State Antiquities Landmark Archeological Criterion 1 (potential to contribute important information) and as eligible for listing on the National Register of Historic Places because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history). It does not merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is not susceptible to vandalism.

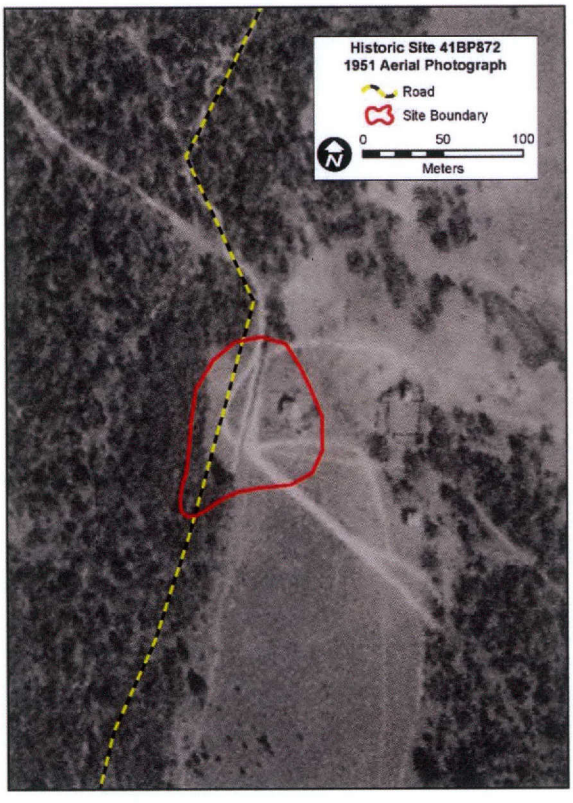

Figure 5-1. 1951 aerial photograph of site 41BP872 and vicinity; note structure in east part of site.

41BP873

This multicomponent site consists of an early twentieth century dump and a prehistoric lithic procurement area adjacent to a small, intermittent tributary of Alum Creek. The site measures 160 m north-south by 80 m east-west, and encompasses 2.3 acres. The north-central part of the site is located on a level knoll that has been cleared and is covered in low grass. The rest of the site supports mature juniper and hardwood trees with a moderate to dense understory of yaupon shrubs and vines, which was scorched by the September 2011 wildfire but remains intact. The south half of the site is on a moderate slope where lag gravels have been exposed by erosion of the clayey soils.

Soils within the northwest corner of the site are site are mapped as the Robco-Tanglewood complex, 1 to 5 percent slopes (Soil Survey Staff 2019). These soils occur on the toeslopes and footslopes of ridges and formed from weathered sandstone, claystone, and shale of Eocene age. A typical soil profile includes up to 66 cm of loamy fine sand overlying a sandy clay loam B horizon. The rest of the site is situated within Edge fine sandy loam, 5 to 12 percent slopes, eroded. This soil occurs on the backslopes and sideslopes of ridges and formed from stratified sandstone and mudstone of Eocene age. A typical soil profile consists of 27 cm of fine sandy loam overlying stratified clay, clay loam, and sandy clay loam B horizons.

Site 41BP873 has been impacted by clearing and rodent burrowing in the north half, sheet erosion in the south half, and scorching during the September 2011 wildfire. Bioturbation, primarily from rodent burrowing, has impacted the north half of the site. A dirt road bisects the site from southwest to north, leading to historic site 41BP872 ca. 300 m to the north. A power line with cleared right-of-way runs east-west along the north boundary of the site. Approximately 30 percent of the ground surface was visible at the time the site was recorded.

History

Site 41BP873, along with 41BP872 and previously recorded site 41BP834, are in the general area where the Yewpon community was established in the early twentieth century (see Appendix A). Some of the artifacts date to the period when the community was in existence; others are later and could derive from the homestead represented by 41BP872. The site adjoins an unimproved road that is depicted on the 1948 Smithville USGS topographic map and originates on Gotier Trace; unimproved roads also connect the three sites.

Survey Results

The boundary of site 41BP873 was defined by a surface scatter of historic and prehistoric artifacts. The prehistoric component is minor, consisting of a diffuse scatter of lithic procurement debris, including cores and tested cobbles associated with exposed gravels. Most of the historic artifacts are scattered along and in the drainage and consist of domestic items including solarized glass, glass jars and bottles, ceramics, tin cans, and other metal artifacts. Bottle bases and

manufacturing attributes date the occupation from ca. 1900 through the 1930s. The bottles are clear and green glass vessels for medicine, beverages, condiments, and food items; manufacturers include Owens-Illinois and Anchor Hocking. Glass fragments include brown, light green, clear, and milk glass. A tin basin with a somewhat ornate cast iron stand was originally thought to be a stove, but is too small (roughly 30 to 40 cm in diameter). The legs of the stand have a fan-like design in relief, and the rivets on the stand have a decorative star pattern. While the items are too rusted and damaged for positive identification, they may be an old washstand. A small dump measuring roughly 2 by 2 m was found on the bank of the drainage. Seven historic artifacts were collected from the surface.

Two shovel tests were excavated. Shovel Test 1 was placed in the south part of the site in an area of extensive natural gravels with some tested cobbles and debitage. One flake was recovered in the upper humus layer, and the test was terminated at 20 cm below surface in blocky clay. Shovel Test 2 was located in the clearing near the north end of the site and was excavated through 35 cm of fine sand. No artifacts were recovered, and the test was terminated at 40 cm below surface after reaching clay.

Materials Recovered

The eight artifacts collected from site 41BP873 consist of three sponge decorated earthenware sherds, a clear glass molded bottle, a turn-mold olive glass bottle fragment, two pieces of solarized shaped-glass, and a single piece of debitage. Sponge decoration became a common decorative technique for white earthenware ceramics beginning in the late 1840s, and continued through 1930 (Miller 1991:6; Miller et al. 2000:13). The clear glass bottle is a Vaseline hair tonic bottle that dates no earlier than 1927 (Lindsey 2013) and as late as 1950 (JonWilliamson.com 2013). The olive glass bottle was produced using the turn-mold method, most commonly used from 1880 to 1920 (Newman 1970:72-75). The solarized glass fragments date between 1880 and 1916, when manganese was used to decolor clear glass (Munsey 1970:55). The single piece of debitage is a complete secondary flake that measures between 45 and 64 mm in maximum dimension.

Summary and Assessment

Site 41BP873 is a historic dump located on the slopes of a knoll that dates to the early twentieth century, with a prehistoric lithic procurement area as a minor component. The research potential of the historic component is considered to be relatively high due to its apparent association with the Yewpon community. The prehistoric component has less research potential given the shallow, non-aggrading geomorphic context and low density of artifacts. The probability of buried prehistoric cultural materials in a primary context in this setting is low, and the potential for artifacts of different ages to have been deposited on or near the same prehistoric surface is high.

Site 41BP873 is recommended for official designation as a State Antiquities Landmark because it meets State Antiquities Landmark Archeological Criterion 1 (potential to contribute

important information) due to its apparent association with the Yewpon community. It does not merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is not susceptible to vandalism. It is also recommended as eligible for listing on the National Register of Historic Places because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history).

41BP874

This prehistoric lithic procurement site is located on a small knoll 550 m from an intermittent tributary of Alum Creek. The site measures 50 m north-south by 40 m east-west, and covers 0.3 acres. The hill is part of a minor divide, and its crest is covered with sandstone, chert, and quartzite cobbles up to 30 cm in size. Soils within the northwest corner of the site are mapped as the Robco-Tanglewood complex, 1 to 5 percent slopes (Soil Survey Staff 2019). These soils occur on the toeslopes and footslopes of ridges and formed from weathered sandstone, claystone, and shale of Eocene age. A typical soil profile includes up to 66 cm of loamy fine sand overlying a sandy clay loam B horizon. Vegetation is loblolly pine-oak woodland with a moderately dense understory and heavy leaf litter. Known impacts to the site are primarily from sheet erosion. Because the site was not burned by the September 2011 wildfire, approximately 30 percent of the ground surface was visible at the time the site was recorded.

Survey Results

The boundary of site 41BP874 was defined by the extent of the landform and the visible extent of artifacts and siliceous gravels. Two shovel tests were excavated to assess the depth of the cultural deposits. Shovel Test 1 was placed on the slope off the crest and produced nine pieces of debitage and one core between 0 and 12 cm below surface in sandy sediments. No artifacts were found in the underlying clay, and Shovel Test 1 was terminated at 20 cm below surface. Shovel Test 2 was placed on top of the small hill and produced six pieces of debitage between 0 and 10 cm below surface in sand. No artifacts were recovered in the underlying clay, and the test was terminated at 20 cm below surface.

Materials Recovered

The 16 artifacts collected from site 41BP874 consist of 15 pieces of debitage and one core. The core is a tested cobble of medium-grained chert with some fine-grained inclusions; the cortex on the cobble is rough and pitted, suggesting that it originated from a local gravel outcrop rather than a creek bed. The debitage consists of eight complete flakes, five pieces of angular debris, and two flake fragments, all composed of fine-grained chert, with the exception of a single quartzite flake. Based on amounts of dorsal cortex, one of the complete flakes is primary, four are secondary, and three are tertiary. Six of the complete flakes are between 25 to 44 mm in maximum dimension, one is less than 24 mm, and one (the primary flake) is between 85 and 104 mm in maximum dimension. The complete flake sample is indicative of lithic procurement and early stage reduction, and it is the only site recorded during the current survey where the majority of

flakes have cortex. This also is one of the three sites from which a complete primary flake was recovered.

Summary and Assessment

Site 41BP874 is a low-density prehistoric lithic procurement site with cultural deposits up to 12 cm deep. The site is situated on a knoll, a landform that was static and non-aggrading and unlikely to preserve deeply buried cultural materials or stratified deposits. The research potential of the site is therefore considered low given the shallow cultural deposits, low artifact density and diversity, and absence of temporally diagnostic artifacts.

Site 41BP874 is not recommended for official designation as a State Antiquities Landmark because it does not meet State Antiquities Landmark Archeological Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods). It does not merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is not susceptible to vandalism. Site 41BP874 is also not recommended as eligible for listing on the National Register of Historic Places because it does not meet Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history).

41BP875

This prehistoric open campsite is located on the crest of a divide between two intermittent tributaries of Copperas Creek, located at distances of 250 m and 350 m from the site. The site measures 150 m north-south by 90 m east-west, and encompasses 2.6 acres. A mound capped by chert and quartzite gravels is located on top of the hill (Figure 5-2). Soil within the site is mapped as Padina fine sand, 1 to 12 percent slopes (Soil Survey Staff 2019). This soil occurs on the summits and backslopes of ridges and formed from weathered sandstone of Eocene age. A typical soil profile includes up to 1.5 m of fine sand overlying a sandy clay loam B horizon. Vegetation is loblolly pine-oak woodland, but the area was heavily burned during the September 2011 wildfire. The trees are still standing, but no underbrush or ground cover was present at the time of the investigations and ground surface visibility was 90 percent. Site 41BP875 has also been impacted by bioturbation, primarily from animal burrowing.

Figure 5-2. Overview of site 41BP875; note mound of chert and quartzite gravels behind archeologists, who are standing on a patch of soil that was oxidized by intensive burning.

Survey Results

The boundary of site 41BP875 was defined by the extent of a surface scatter of lithic artifacts and a distinct landform. Most of the debitage observed consisted of tertiary flakes; small amounts of fire-cracked rock, one core, one uniface fragment, and one edge-modified flake were also observed. Two shovel tests were excavated to test areas with higher surface artifact densities; both passed through fine sand and ended at a maximum depth of 100 cm below surface due to difficulty of digging. Shovel Test 1 was placed in an area southwest of the gravel mound; it yielded between 11 and 13 pieces of debitage per level from the surface to a depth of 40 cm below surface, and between 2 and 9 pieces of debitage per level between 40 and 100 cm below surface. Shovel Test 2 was placed at the north end of the site. It produced five pieces of debitage in the uppermost 20 cm, and the underlying levels yielded from 15 to 23 pieces of debitage. A ground stone mano fragment was recovered between 20 and 40 cm below surface in Shovel Test 1, and a core was recovered between 40 and 60 cm below surface in Shovel Test 2.

Materials Recovered

The 117 artifacts collected from site 41BP875 consist of 115 pieces of debitage, one core, and one mano fragment. The small, fine-grained chert core appears to have been exhausted during reduction. The debitage consists of 61 complete flakes, 31 flake fragments, 21 proximal flake fragments, and two pieces of angular debris. Based on amounts of dorsal cortex, eight of the complete flakes are secondary and 53 are tertiary. Thirty-four of the complete flakes are less than

24 mm in maximum dimension, 17 are between 25 to 44 mm, eight are between 45 and 64 mm, one is between 65 and 84 mm, and one is between 85 and 104 mm. The small mano fragment is made of a whitish to light pink, very coarse-grained quartzite with one smooth planar face and one more rounded face.

Summary and Assessment

Site 41BP875 is a prehistoric open campsite with cultural deposits at least 100 cm deep. The site is situated on the crest of a small divide between two tributaries where deposition may have been more dynamic than the standard model of soil development within the sandy mantle formation. Although the diversity of artifacts recovered is low, and no temporally diagnostic artifacts were found, the site is large and the density of artifacts is relatively high. The site therefore has potential for exploring site formation processes in the sandy mantle formation and may contain deeply buried cultural deposits.

Site 41BP875 is recommended for official designation as a State Antiquities Landmark because it meets State Antiquities Landmark Archeological Criterion 1 (potential to contribute important information) and as eligible for listing on the National Register of Historic Places because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history). It does not merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is not susceptible to vandalism.

41BP876

This Archaic open campsite is located on a knoll on a ridge top, 150 m from an intermittent tributary of Puss Hollow. The site measures 80 m north-south by 30 m east-west, and encompasses 0.4 acres. The knoll apparently was formed by gravelly sediments more resistant to erosion. A gravel outcrop adjoins the site to the northeast, and sandstone bedrock crops out north of the hilltop. Soil within the site is mapped as Padina fine sand, 1 to 12 percent slopes and Jedd gravelly fine sandy loam, 5 to 20 percent slopes (Soil Survey Staff 2019). The former occurs on the summits and backslopes of ridges and formed from weathered sandstone of Eocene age. A typical soil profile includes up to 1.5 m of fine sand overlying a sandy clay loam B horizon. The latter occurs on slopes and ridges and formed from weathered Eocene sandstone. A typical soil profile includes 30 cm of gravelly fine sandy loam overlying 40 cm of clay above bedrock. The area was heavily burned by the September 2011 wildfire, and burned loblolly pines and oak trees were still standing at the time of investigations. No underbrush or groundcover remained, and 100 per cent of the ground surface was visible. The site has been impacted by fire, erosion, and bioturbation.

Survey Results

The boundary of site 41BP876 was defined by the extent of a surface scatter of lithic artifacts that appeared to be associated with the hilltop gravel deposit. No artifacts were found in the gravel deposit so it was not included in the site. The sparse scatter consisted primarily of

tertiary flakes, and included a few tool fragments. A distal dart point fragment and a biface fragment were collected from the extreme north and south ends of the site, respectively.

Two shovel tests were excavated. Shovel Test 1 was placed on a slope at the south end of the site and produced one fire-cracked rock between 0 and 20 cm below surface. It passed through sand with many chert and quartzite gravels that increased in quantity with depth, and hit sandy clay at a depth of 34 cm below surface, ending at 40 cm below surface. Shovel Test 2 was situated near an area with a relatively high artifact density near the center of the site. It yielded between 4 and 7 pieces of debitage from every level. The matrix was fine sand to a depth of 80 cm below surface, and then the test hit sandy clay; it ended at 91 cm below surface.

Materials Recovered

The 27 artifacts collected from site 41BP876 consist of 24 pieces of debitage, one dart point fragment, one biface fragment, and one fire-cracked rock. The dart point fragment is a distal fragment and could not be identified by type. Dart points date broadly to the Archaic period, between 7000 B.C. and A.D. 600 (Johnson and Goode 1994:5). The biface is a late-stage, proximal-medial fragment with a concave, possibly notched base. The debitage consists of 11 complete flakes, five proximal flake fragments, five flake fragments, and three pieces of angular debris. Based on amounts of dorsal cortex, nine of the complete flakes are tertiary, while the other two are secondary. Seven of the complete flakes are less than 24 mm in maximum dimension, three are between 25 to 44 mm, and one is between 65 and 84 mm. Given the dominance of small tertiary flakes among the complete flakes, it appears that initial reduction of the raw materials for making tools at the site occurred elsewhere. The fire-cracked rock is composed of quartzite.

Summary and Assessment

Site 41BP876 is an open campsite that contains an Archaic component and cultural deposits up to 91 cm deep. The site is situated on a knoll on a ridgetop, a landform that was likely static and non-aggrading. Shovel testing within the site exposed strata consistent with Jedd gravelly fine sandy loam, a shallow soil unlikely to contain deeply buried cultural materials or stratified deposits. Although cultural materials were found at depths up to 91 cm below surface, cultural materials of different ages in this depositional setting may have been deposited on or near the same prehistoric surfaces and subsequently mixed over time. Although the site has a moderate diversity of artifacts, the research potential of the site is considered to be relatively low.

Site 41BP876 is not recommended for official designation as a State Antiquities Landmark, because it does not meet State Antiquities Landmark Archeological Criteria 1 through 4 (potential to contribute important information, integrity, presence of unique attributes, or opportunity to test new research methods) due to the low artifact density and depositional context. It does not merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is not susceptible to vandalism. Site 41BP876 is also not recommended as eligible for listing on the

National Register of Historic Places because it does not meet Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history).

41BP877

This Late Archaic lithic scatter is located on the slope of a hill, 160 m from an intermittent tributary of Copperas Creek. The site measures 140 m northeast-southwest by 80 m northwest-southeast, and encompasses 2.2 acres. The crest of the hill is covered with chert gravels. Soil within the site is mapped as Jedd gravelly fine sandy loam, 5 to 20 percent slopes (Soil Survey Staff 2019). This soil occurs on the backslopes and sideslopes of ridges and formed from weathered sandstone of Eocene age. A typical soil profile includes up to 30 cm of gravelly fine sandy loam overlying a clay loam B horizon. Vegetation is loblolly pine-oak woodland and was heavily burned during the September 2011 wildfire. Site 41BP877 has been impacted by rodent burrowing and erosion due to lack of ground cover after it was burned. Approximately 90 percent of the ground surface was visible at the time the site was recorded (Figure 5-3).

Figure 5-3. Archeologists digging Shovel Test 1 in south part of site 41BP877; gravel-covered hilltop in background.

Survey Results

The boundaries of site 41BP877 were defined by the extent of a surface scatter of debitage, cores, and bifaces. Seven shovel tests were excavated; five passed through fine sand and ended at a depth of 100 cm below surface due to difficulty of digging. Shovel Test 1 was placed in an area of relatively high artifact density in the south part of the site, and Shovel Test 2 was situated near

two bifaces in the west part of the site. Both shovel tests yielded from 1 to 6 pieces of debitage from every level. An additional five shovel tests were excavated at a later date when vegetation growth impaired surface visibility to less than 10 percent and no artifacts were visible on the surface. Shovel Tests 3, 4, and 6 were excavated along the east boundary of the site and ended at a depth of 100 cm below surface. Shovel Test 3 yielded 1 to 4 pieces of debitage per level to a depth of 60 cm below surface; deposits from 60 to 100 cm below surface were sterile. Shovel Test 4 yielded 2 to 4 artifacts in levels 1, 2, and 4. Levels 3 and 6 were negative. Shovel Test 6 yielded 3 pieces of debitage per level from 20 to 100 cm below surface in depth. Shovel Tests 5 and 7 were shallow, 20 cm over red clay and 55 cm over large cobbles respectively. Though likely not cultural, heat fractured chert was encountered in Shovel Test 5, and Shovel Test 7 yielded one piece of debitage in level 1.

Materials Recovered

The 71 artifacts collected from site 41BP877 consist of 69 pieces of debitage, one core fragment, and one proximal-medial Lange dart point fragment. Lange dart points were used during the Late Archaic period, and were associated with a component at site 41LK28 that was radiocarbon dated between 850 and 550 B.C. (Highley et al. 1995:423; Turner et al. 2011:127). The debitage consists of 26 flake fragments, 17 complete flakes, 16 pieces of angular debris, and 10 proximal flake fragments. Based on amounts of dorsal cortex, 11 of the complete flakes are tertiary, four are secondary, and two are primary. Nine of the complete flakes are less than 24 mm in maximum dimension, six are between 25 to 44 mm, one is between 45 to 64 mm, and one is between 65 and 84 mm.

Summary and Assessment

Site 41BP877 is a large, potentially multicomponent, prehistoric lithic scatter with cultural materials extending at least 100 cm in depth. Although soil within the site is mapped as Jedd gravelly fine sandy loam, the strata within most of the shovel tests are consistent with Padina fine sand, 1 to 12 percent slopes, a soil with potential for deeply buried deposits. Given the position of the site on a south facing slope, the depositional conditions during site formation may have been moderately aggrading, especially at lower elevations. Therefore, the research potential of the site is considered to be relatively high given that a temporally diagnostic dart point was recovered and a high diversity of tools were observed on the surface over a large area. Additionally, the site has potential for exploring site formation processes in the sandy mantle formation.

Site 41BP877 is recommended for official designation as a State Antiquities Landmark because it meets State Antiquities Landmark Archeological Criterion 1 (potential to contribute important information) and as eligible for listing on the National Register of Historic Places because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history). It does not merit designation under State Antiquities Landmark

Archeological Criterion 5 at this time because it is not susceptible to vandalism. The site is not visible from the road and vegetation growth has obscured surface visibility.

41BP878

This prehistoric open campsite is located on a level bench between steep slopes, 180 m from an intermittent tributary of Copperas Creek. The site measures 60 m north-south by 70 m east-west, and encompasses 1.0 acre. Large sandstone cobbles containing a few siliceous pebbles are scattered across the southwest part of the site. Soil within the site is mapped as Padina fine sand, 1 to 12 percent slopes (Soil Survey Staff 2019). This soil occurs on the summits and backslopes of ridges and formed from weathered sandstone of Eocene age. A typical soil profile includes up to 1.5 m of fine sand overlying a sandy clay loam B horizon. Vegetation is loblolly pine-oak woodland and was heavily burned during the September 2011 wildfire. During the investigations, the burned trees were still standing, but all of the underbrush and ground cover were gone, leaving 100 percent of the ground surface visible. Impacts to the site include bioturbation and burning.

Survey Results

The site boundary was defined by the extent of a sparse surface scatter of debitage and the distribution of ten shovel tests, nine of which contained lithic debitage. Shovel Test 1 was excavated in an area with a slightly greater number of artifacts on the surface. The test produced 2 to 11 pieces of debitage from every level between 0 and 80 cm below surface. The matrix was fine sand to a depth of 28 cm below surface, and included numerous sandstone and siliceous gravels to a depth of 47 cm below surface. It hit loamy clay at that depth, and ended at 80 cm below surface when it hit clay. Shovel Test 3 was excavated in the approximate center of the site. The test produced 3 to 16 pieces of debitage in each level between 0 and 80 cm below surface. The matrix was fine sand throughout. Shovel Test 4, excavated 15 m east of Shovel Test 1, produced a total of 7 pieces of debitage between 20 and 80 cm below surface. The matrix was fine sand throughout. Shovel Test 2 contained 3 pieces of debitage but reached cobbles at 40 cm below surface. Shovel Tests 5, 6, 7, 9, and 10 each contained 1 to 4 pieces of debitage between 20 and 100 cm below surface, all in a sandy matrix. Shovel Test 8 reached 100 cm below surface but contained no cultural materials.

Materials Recovered

The 89 artifacts collected from site 41BP878 include 87 pieces of debitage and one core from shovel tests, and a ground stone mano fragment from the surface. The debitage consists of 39 flake fragments, 28 complete flakes, 15 proximal flake fragments, and five pieces of angular debris. Based on amounts of dorsal cortex, 25 of the complete flakes are tertiary and three are secondary, with 15 less than 24 mm in maximum dimension, 11 between 25 to 44 mm, and two between 45 to 64 mm. The mano is made of whitish, very coarse-grained quartzite, with a planar use face and a rounded obverse face.

Summary and Assessment

Site 41BP878 is a prehistoric open campsite with cultural deposits at least 100 cm deep. The site is situated on a level bench between slopes, a landform that may have been aggrading during site formation. Given the geomorphic context, relatively deep deposits, and moderate artifact density and diversity, the site has potential for further research. The site also has potential for exploring site formation processes in the sandy mantle formation.

Site 41BP878 is recommended for official designation as a State Antiquities Landmark because it meets State Antiquities Landmark Archeological Criterion 1 (potential to contribute important information) and as eligible for listing on the National Register of Historic Places because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history). It does not merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is not susceptible to vandalism. The site is not visible from the road and vegetation growth has obscured surface visibility.

41BP879

This multicomponent lithic scatter is located on a small rise that slopes gently toward Alum Creek, 150 m to the west. The site measures 100 m north-south by 70 m east-west, and encompasses 1.7 acres. Large gravels are present on the southwest edge of the site. Soil within the site is mapped as Edge gravelly fine sandy loam, 3 to 8 percent slopes (Soil Survey Staff 2019). This soil occurs on the summits and backslopes of ridges and formed from weathered shale and sandstone of Eocene age. A typical soil profile includes up to 13 cm of gravelly fine sandy loam overlying 68 cm of a sandy clay B horizon.

Vegetation is loblolly pine–oak woodland that was heavily burned during the September 2011 wildfire. At the time of investigations, the burned trees were still standing but no ground cover was present; 100 percent of the ground surface was visible. Site 41BP879 has been impacted by a road that bisects the site, and four old uncontrolled excavations as large as 1 by 1 m were visible in 2011, along with their associated backdirt piles. Two small dumps of 1960s-1970s refuse were also observed, and modern debris is thinly scattered across the site. A large tractor had driven across the site, based on tire tracks noted during the investigations.

Survey Results

The boundary of site 41BP879 was defined by the horizontal extent of a relatively dense scatter of debitage, cores, and bifaces. Two shovel tests were excavated within the artifact distribution. Shovel Test 1 was placed in an area of higher artifact density near where dart points were found on the surface. The test yielded 23 pieces of debitage between 0 and 18 cm below surface in sandy loam, and no artifacts were recovered from a clay loam that extended from a depth of 18 cm below surface to at least 40 cm below surface, where the test ended. Shovel Test 2 was situated in an area that appeared likely to have deeper sand. Small amounts of debitage were

recovered between the surface and a depth of 37 cm below surface in sandy loam. The test hit basal clay at that depth and ended at 40 cm below surface.

Materials Recovered

The 41 artifacts collected from site 41BP879 include 33 pieces of debitage, three dart points, three bifaces, an arrow point (collected in 2013), and a denticulated flake. One dart point is an Angostura and dates to the late Paleoindian period; its span of use ranges from roughly 6850 to 6050 B.C. (Turner et al. 2011:59), although Collins (2004:119) considers this time period to be the beginning of the Early Archaic period. The other two dart points are typed as Ensor, and date between 200 B.C. and A.D. 600 (Turner et al. 2011:94). The arrow point is typed as Edwards, which dates to the Austin style interval of the Late Prehistoric period, spanning a period of A.D. 900 to 1100 (Turner et al. 2011:190).

All three bifaces are made of fine-grained chert; two are in the middle stage of reduction, while the third is a late-stage proximal-medial fragment that likely is an arrow point preform. The denticulate (serrated) flake is not temporally diagnostic, although Jelks (1962:86) considered serrated flakes to be a trait of the Austin style interval of the Late Prehistoric period. The debitage consists of 13 complete flakes, 10 flake fragments, nine proximal flake fragments, and one piece of angular debris. Nine of the complete flakes are tertiary, while the other four are secondary. Six of the complete flakes are less than 24 mm in maximum dimension, three are between 25 to 44 mm, three are between 45 and 64 mm, and one is between 65 and 84 mm.

Summary and Assessment

Site 41BP879 is a multicomponent lithic scatter that dates at least in part to the late Paleoindian, Late Archaic, and Late Prehistoric periods. The site is situated near the summit of a small hill that would likely have been static and non-aggrading during site formation. The cultural deposits are correspondingly shallow, with depths up to 37 cm below ground surface. However, the research potential of the site is considered to be moderately high, based on tool diversity, artifact density, and presence of temporally diagnostic artifacts, including one of the few Paleoindian projectile points found in the park to date. With multiple components present, further work at the site has potential to contribute to a better understanding of site formation processes in the sandy mantle formation.

Site 41BP879 is recommended for official designation as a State Antiquities Landmark because it meets State Antiquities Landmark Archeological Criterion 1 (potential to contribute important information). It also merits designation under State Antiquities Landmark Archeological Criterion 5 because it is susceptible to vandalism due to its location adjacent to a road. Regrowth of the understory should help to reduce the high surface visibility of this site. Site 41BP879 is additionally recommended as eligible for listing on the National Register of Historic Places because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history).

41BP880

This Late Prehistoric open campsite is located on the top and slopes of a knoll between two small intermittent tributaries of Puss Hollow, at distances of 40 m and 60 m from the site. Site 41BP880 measures 80 m north-south by 70 m east-west, and encompasses 0.9 acres. Soil within the site is mapped as Edge gravelly fine sandy loam, 3 to 8 percent slopes (Soil Survey Staff 2019). This soil occurs on the summits and backslopes of ridges and formed from weathered shale and sandstone of Eocene age. A typical soil profile includes up to 13 cm of gravelly fine sandy loam overlying 68 cm of a sandy clay B horizon.

The vegetation is loblolly pine-oak woodland that was heavily burned during the September 2011 wildfire. At the time of investigations, burned trees were still standing but the understory and ground cover were absent; almost 100 percent of the ground surface was visible. The site has been impacted by erosion from runoff and gullying, and bioturbation typical of the sandy mantle.

Survey Results

The boundary of site 41BP880 was defined by the extent of a surface scatter of artifacts and the landform. Artifacts observed on the surface included 20 scattered pieces of mostly tertiary debitage, one biface, one core, and one projectile point that was collected. Shovel Test 1 was excavated near the location where the arrow point was found. The matrix consisted of fine sand from 0 to 74 cm below surface, where an abrupt boundary marked a change to sandy clay with ferruginous concretions. Sparse debitage ranging from 1 to 8 pieces was recovered from every level between 0 and 60 cm below surface. A mano fragment was recovered between 20 and 40 cm below surface. A possible buried fire-cracked rock feature was observed at 75 cm below surface, consisting of three quartzite fire-cracked rocks and four sandstone rocks that appear to be burned. No artifacts were recovered below 80 cm below surface, and the test was terminated at 85 cm below surface when it hit hard clay.

Materials Recovered

The 20 artifacts collected from site 41BP880 consist of 11 pieces of debitage, seven pieces of fire-cracked rock, one ground stone mano fragment, and one arrow point fragment. The arrow point is typed as Perdiz and dates to the Toyah style interval of the Late Prehistoric period, between A.D. 1200 and 1700 (Turner et al. 2011:206). The debitage consists of six complete flakes, four flake fragments, and one proximal flake fragment. Based on amounts of dorsal cortex, six of the complete flakes are tertiary, with four less than 24 mm in maximum dimension, one between 25 and 44 mm, and one between 45 and 64 mm. The small ground stone fragment is made of a whitish to light pink, very coarse-grained quartzite with one smooth planar face and one more rounded face. The fire-cracked rocks consist of three quartzite fragments that refit and four sandstone rocks that appear to be burned.

Summary and Assessment

Site 41BP880 is an open campsite situated on the slopes of a low knoll with cultural deposits up to 80 cm deep. One possible fire-cracked rock feature was found at 75 cm below surface in Shovel Test 1, and the diversity of cultural materials is relatively high. Given the geomorphic position of the site, the conditions during site formation may have been dynamic and aggrading, especially at lower elevations. Therefore, the site has potential to contain additional cultural materials in a buried, primary context and address research issues related to site formation processes in the sandy mantle formation.

Site 41BP880 is recommended for official designation as a State Antiquities Landmark, because it meets State Antiquities Landmark Archeological Criteria 1 (potential to contribute important information) and 2 (integrity). It does not merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is not susceptible to vandalism. It is also recommended as eligible for listing on the National Register of Historic Places because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history).

41BP881

This Late Prehistoric open campsite is located on a bench on a slope 150 m from an intermittent tributary of Copperas Creek. Site 41BP881 measures 90 m north-south by 50 m east-west, and covers 0.7 acres. A deposit of chert and quartzite gravels is present on the southeast toe of the slope within the site boundary and above a conglomerate sandstone outcrop. Soil within the site is mapped as Padina fine sand, 1 to 12 percent slopes (Soil Survey Staff 2019). This soil occurs on the summits and backslopes of ridges and formed from weathered sandstone of Eocene age. A typical soil profile includes up to 1.5 m of fine sand overlying a sandy clay loam B horizon.

Vegetation is loblolly pine-oak woodlands that was heavily burned during the September 2011 wildfire. At the time of investigation the burned trees were still standing and no ground cover was present because of the fire; 100 percent of the ground surface was visible. Site 41BP881 has been impacted by animal burrowing and road construction; one edge of the site was impacted by a road that forms the site boundary. The site has been eroded due to vegetation loss after the wildfire.

Survey Results

The boundary of site 41BP881 was defined by the extent of a diffuse lithic scatter and the excavation of nine shovel tests, six of which yielded cultural materials. Shovel Test 1 was excavated within an artifact concentration near the center of the site on top of the ridge. Debitage was recovered from all levels, with amounts ranging from 4 to 20 pieces per level, although two-thirds of the debitage was recovered from the uppermost 40 cm. An edge-modified flake was recovered from between 40 and 60 cm below surface, and a distal arrow point fragment was

recovered from the lowest level. The matrix was fine sand from 0 to 80 cm below surface, and sandy clay from 80 to 92 cm below surface, where the shovel test was terminated due to difficulty of digging. Shovel Test 2, located 20 m to the north, encountered pre-Holocene deposits at 30 cm below surface, contained 11 pieces of debitage in level 1 (0 and 20 cm below surface) and four pieces in level 2 (20 to 30 cm below surface). Shovel Tests 4 and 5 (located 20 m east and 20 m southwest of Shovel Test 1 respectively) reached pre-Holocene deposits between 30 and 35 cm below surface. Each test contained five pieces of debitage. Shovel Tests 6 (20 m south of Shovel Test 5) reached pre-Holocene deposits at 20 cm below surface and contained only two pieces of debitage. Shovel Test 8, located 20 m northwest of Shovel Test 1, was the second most productive shovel test at 41BP881 and reached 85 cm below surface. It contained seven pieces of debitage in level 1 (0 to 20 cm below surface), nine pieces of debitage in level 2 (20 to 40 cm below surface), 11 pieces of debitage in level 3 (40 to 60 cm below surface), and 23 pieces of debitage in level 4 (60 to 80 cm below surface). Shovel Test 3, at the north edge of the site, Shovel Test 7 at the southeast edge of the site, and Shovel Test 9 at the northeast edge of the site were all negative for cultural materials. The total depths were 20 cm below surface, 5 cm below surface, and 50 cm below surface respectively.

Materials Recovered

The 150 artifacts collected from site 41BP881 include 147 pieces of debitage, an arrow point fragment, a modified flake, and a ground stone mano fragment. The distal-medial arrow point fragment cannot be typed; arrow points are associated with the Late Prehistoric period, between A.D. 700 and 1700 (Collins 2004:122-123). The edge-modified flake is a proximal flake fragment with a 12 mm long worked edge adjacent to the platform. The debitage consists of 57 flake fragments, 41 complete flakes, 35 proximal flake fragments, and 14 pieces of angular debris. Based on amounts of dorsal cortex, thirty-six of the complete flakes are tertiary, four are secondary, and one is primary. Twenty-seven of the complete flakes are less than 24 mm in maximum dimension, twelve are between 25 and 44 mm, and two are between 45 and 64 mm. The mano is mostly complete and made from a dense, reddish, somewhat coarse-grained quartzite cobble. It has one rounded face and one irregular, slightly concave face; both appear to be working surfaces.

Summary and Assessment

Site 41BP881 is a Late Prehistoric open campsite with cultural deposits at least 92 cm deep. Given the position of the site on the bench of a slope, the landform may have been moderately aggrading during site formation. Given the relatively deep deposits, one temporally diagnostic artifact, and moderate artifact diversity and density, the site has potential for further research. The site also has potential for exploring site formation processes in the sandy mantle formation.

Site 41BP881 is recommended for official designation as a State Antiquities Landmark because meets State Antiquities Landmark Archeological Criterion 1 (potential to contribute important information) and as eligible for listing on the National Register of Historic Places

because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history). It may merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is susceptible to vandalism due to its location near a road.

41BP882

This multicomponent prehistoric campsite is located on a terrace and the lower slopes of a ridge, 40 m south of Alum Creek. Site 41BP882 measures 330 m north-south by 250 m east-west, and encompasses 17.5 acres. The stream's floodplain bounds the site on two sides, and a knoll capped by an extensive gravel deposit rises to the southeast above it. Open areas of the site are grassy meadows. The site is partially shaded by loblolly pine-oak woodland and was lightly burned to scorched during the September 2011 wildfire; most of the trees survived. Approximately 80 percent of the ground surface was visible at the time of the investigations. Site 41BP882 has been impacted by clearing and animal burrows in open areas, by minor erosion along two unimproved roads that cross the site, and by the wildfire.

Three soil types are plotted within the site (Soil Survey Staff 2019). The Robco-Tanglewood complex, 1 to 5 percent slopes comprises the majority of the soil within the site. These soils occur on the toeslopes and footslopes of ridges and formed from weathered sandstone, claystone, and shale of Eocene age. A typical soil profile includes up to 66 cm of loamy fine sand overlying a sandy clay loam B horizon. Jedd gravelly fine sandy loam, 5 to 20 percent slopes, is the second most abundant soil within the site and is mapped near the center and along the eastern boundary. This soil occurs on slopes and ridges and formed from weathered Eocene sandstone. A typical soil profile includes 30 cm of gravelly fine sandy loam overlying 40 cm of clay above bedrock. A small amount of Edge fine sandy loam, 1 to 5 percent slopes is mapped at the southwest corner of the site. This soil formed on ridges and their slopes and is derived from stratified sandstone and mudstone of Eocene age. A typical soil profile contains 30 cm of fine sandy loam overlying 50 cm of clay and 41 cm of a clay loam b horizon. Soil just outside the site boundary to the north along Alum Creek is mapped as Sayers fine sandy loam, 0 to 1 percent slopes, occasionally flooded. This soil formed from sandy alluvium of Holocene age derived from mixed sources. A typical soil profile consists of 30 cm of fine sandy loam overlying 122 cm of loamy fine sand and has potential to contain deeply buried cultural deposits.

Previous Investigations

TPWD archeologist Rich Mahoney was informed of this site in 2005. He monitored the site intermittently after that date and collected 25 prehistoric artifacts and two historic artifacts from the surface. In 2008 Mahoney excavated Shovel Test 1 in a location that was later determined to be the approximate center of the site on the edge of a dense scatter of artifacts on the surface. The test passed through fine sand and ended at a depth of 100 cm due to wall collapse. It yielded debitage from every level, in amounts ranging from 9 to 19 pieces. A biface fragment was

recovered between 0 and 20 cm below surface. One to four fire-cracked rocks were recovered in all but one level. Charred nutshells were recovered between 40 and 60 cm below surface.

Survey Results

The boundary of site 41BP882 was defined by the extent of a surface scatter of artifacts and the landform. Surface artifacts are most dense in the center of the site where the gravelly upland ridge meets the meadow. Two shovel tests were excavated in 2011. Shovel Tests 2 and 3 were placed near the edges of the surface artifact scatter, on lower slopes. They were dug to depths of 95 to 100 cm below surface, and encountered cultural materials throughout. Clay underlay the fine sand at depths of 80 to 95 cm below surface in these tests. Debitage was recovered in all levels of the tests, ranging from 4 to 14 pieces per level in Shovel Test 2 and 2 to 3 pieces per level in Shovel Test 3. An untyped dart point base was found between 20 and 40 cm below surface in Shovel Test 2, and a distal dart point fragment was recovered between 80 and 100 cm below surface in Shovel Test 3. A piece of fire-cracked rock was recovered between 60 and 80 cm below surface in Shovel Test 2. Single cores were found between 0 and 20 cm below surface in Shovel Test 1, and between 40 and 60 cm below surface in Shovel Test 2.

Materials Recovered

The 189 artifacts collected from site 41BP882 consist of 124 pieces of debitage, 21 bifaces, 15 dart points and fragments, 10 fire-cracked rocks, three cores, two ground stone artifacts, one arrow point, one scraper, one drill, one perforator, one denticulate flake, one historic ceramic sherd, and one historic cut nail. Seven charred nutshell fragments were also recovered.

The dart points consist of specimens from the late Paleoindian period and all periods of the Archaic. The earliest are two Golondrina point fragments, which have been dated to the late Paleoindian period, around 7000 B.C. (Turner et al. 2011:110-111). The Martindale dart point generally dates to the late part of the Early Archaic period; proposed age spans differ among the sources (e.g., Collins 2004:119; Oksanen et al. 2008:9-1; Turner et al. 2011:132).

A Wells-like dart point may date to the Middle Archaic period, between 4000 and 2500 B.C. (Turner et al. 2011:170). Two proximal-medial Travis dart point fragments date to the Middle Archaic period, between 2650 and 2050 B.C. (Turner et al. 2011:165).

Six of the dart points date to the Late Archaic period. One Castroville and one possible Castroville dart point probably date between 800 and 400 B.C. (Turner et al. 2011:71-72). Two dart points identified as Ensor and a Frio dart point date between 200 B.C. and A.D. 600 (Johnson and Goode 1994:36-37; Turner et al. 2011:94, 106). A Darl dart point dates to the end of the Late Archaic period, around A.D. 200 (Turner et al. 2011:82), although radiocarbon dates from recent excavations in and near Bastrop County have returned much later dates (Carpenter et al. 2006:89-90, 96-98, 147; Dixon and Rogers 2006:83, 94-95, 99).

Three untyped dart point fragments date broadly to the Archaic period, between 7000 B.C. and A.D. 600 (Johnson and Goode 1994:5). The single arrow point is a Perdiz preform and dates to the Toyah style interval of the Late Prehistoric period, between A.D. 1200 and 1700 (Turner et al. 2011:206).

The 21 bifaces are made of fine-grained chert, and represent all stages of biface reduction. Three are early stage reduction, one is in the middle stage of reduction, five are late-stage reduction, and 12 are finished tools or fragments. Two of the late-stage bifaces are probable arrow point preforms, and a third appears to be a dart point preform. Three of the finished tools may be projectile point fragments based on morphology and thickness, but could not be identified as such with confidence.

The scraper is a relatively small side scraper made from a milky, fine grained chert. The drill is made from a fine-grained chert flake; it has an irregular base and a bifacial bit. The perforator is made on a coarse-grained chert secondary flake, and its bit is located on the proximal edge. The denticulate (serrated) flake tool is not temporally diagnostic, although Jelks (1962:86) considered serrated flakes to be a trait of the Austin style interval of the Late Prehistoric period.

The three cores are made of fine-grained chert; two are multi-directional and the third is bifacial. The debitage consists of 60 complete flakes, 35 flake fragments, 25 proximal flake fragments, and three pieces of angular debris. Based on amounts of dorsal cortex, 52 of the complete flakes are tertiary, seven are secondary, and one is primary. Thirty-two of the complete flakes are less than 24 mm in maximum dimension, 25 are between 25 and 44 mm, and three are between 45 and 64 mm.

The mano fragment is made of dark-red, medium-grained quartzite; it has one smooth planar face and one more rounded face. The metate is a massive sandstone slab that measures 48 by 38 cm; it is 11 cm thick and weighs over 19 kg. There is a work surface on one face that forms a very shallow basin that is roughly 3 to 4 mm deep. The fire-cracked rocks are quartzite (n=7) and sandstone (n=3). The seven small nutshell fragments are charred and probably pieces of the same nutshell.

The small, green-glazed historic earthenware sherd may be from a plate or saucer. The sherd lacks maker's marks and the green glaze is not temporally diagnostic. One square cut, machine made nail is similar to Type 8 in the Louisiana Nail Chronology, which is the most common type and saw widespread usage from 1820 to 1891 (Wells 1998:91-92, 95), although similar nails are still made today (Nelson 1968:9).

Summary and Assessment

Site 41BP882 is a multicomponent open campsite that dates to the late Paleoindian, Early Archaic, Middle Archaic, Late Archaic, and Late Prehistoric periods, and contains a minor historic component. A significant proportion of the soils within the site may have formed within an

aggrading geomorphic context and contain cultural deposits at least 100 cm deep. The research potential of the site is considered to be very high given the high surface and subsurface artifact densities, potential to contain buried cultural materials in a primary context, a nearly complete sequence of prehistoric components, and the highest quantity of projectile points of any site recorded in Bastrop State Park to date.

Site 41BP882 is recommended for official designation as a State Antiquities Landmark because it meets State Antiquities Landmark Archeological Criteria 1 through 3 (potential to contribute important information, integrity, and presence of unique attributes). Site 41BP882 does not merit designation under State Antiquities Landmark Archeological Criterion 5 at this time because it is not susceptible to vandalism, as it is in an area of the park that currently sees little visitation. If visitation in this area should increase in the future, the site would be highly susceptible to vandalism due to the density and visibility of artifacts on its surface. Site 41BP882 is also recommended as eligible for listing on the National Register of Historic Places because it meets Criteria (d) (history of yielding or likelihood of yielding information important in prehistory or history).

6. MATERIALS RECOVERED

by John Lowe, Logan McNatt, and Margaret Howard

In total, 772 artifacts were analyzed in conjunction with the current investigations at Bastrop State Park. The 470 items collected in 2011 comprise 61 percent of this collection. Also included are 111 prehistoric and 2 historic artifacts collected from the surface and a shovel test at site 41BP882 prior to 2011, and a projectile point and a biface collected from the surfaces of sites 41BP879 and 41BP882 (respectively) in 2013. Additionally, 189 prehistoric artifacts were recovered in 2017 from 41BP877, 41BP878, 41BP881. These items were included in the current analyses to expand the knowledge of the age and character of these sites. The overall objectives of the artifact analyses were to characterize the morphological and functional attributes of artifacts and to identify their spans of use to the extent possible. These data support the identification of site uses, functions, and periods of occupation in the Site Descriptions section of the report.

Prehistoric artifacts and materials comprise 97 percent (n=750) of the sample, and historic artifacts (n=22) make up the remainder. All of these specimens are curated in the Archeology Laboratory of the Texas Parks and Wildlife Department in Austin.

Two points concerning the 2011 project methodology, as discussed earlier in the report, bear repeating as they relate to this section. The first is that collections of artifacts from the surfaces of sites were limited to artifacts judged likely to yield important information on age and/or cultural affiliation, as well as those artifacts that were thought to be at risk of loss. Other types of artifacts were noted on site forms but were not collected. Therefore, the samples of stone tools from almost all of the sites consist entirely of projectile points. It is also important to note that that burned chert was discarded in the field as a natural occurrence, due to the prevalence of wildfires in this area over the centuries. Almost all small chert fragments with pot lid fractures were classified as burned chert, unless they had definite chipped stone attributes such as platforms, bulbs of percussion, and ripple marks. A number of items that initially were collected as debitage were later determined to be naturally burned chert spalls, and were discarded in the laboratory.

Eight pieces of naturally fire-broken chert pieces that refit into a single cobble were collected from the surface of site 41BP876 for use as a sample to distinguish prehistoric cultural materials from naturally burned chert, and are not included in the totals of artifacts analyzed.

PREHISTORIC ARTIFACTS

The 750 prehistoric artifacts consist of 719 chipped stone items, 18 fire-cracked rocks, 6 ground stone items, and seven organic fragments. The chipped stone artifacts are 656 pieces of debitage, 31 tools other than projectile points, 25 projectile points and fragments, and seven cores. The ground stone artifacts are five mano fragments and one large metate. One fourth of the prehistoric artifacts (n = 189, 25 percent) were recovered from 41BP882, including the vast

majority of the dart points and bifaces. This is due in large part to the surface collections made prior to 2011, but also is an indication of the size and intensity of occupation at that site. Due to additional shovel tests excavated in 2017 site 41BP881 accounts for 20 percent of the prehistoric artifact collection (n=150), although all but three of the artifacts are debitage. Site 41BP875 accounts for 16 percent of the prehistoric artifact collection (n=117). Like 41BP881, all but two of the artifacts are debitage. Two sites—41BP872 and 41BP873—are represented by single pieces of debitage; these are primarily historic sites with surficial prehistoric lithic scatters. Samples from the remaining seven sites range from 16 to 89 prehistoric artifacts. Among these, 41BP879 is notable for having eight chipped stone tools recovered along with 33 pieces of debitage.

John D. Lowe analyzed the projectile points and tools. Logan McNatt analyzed the debitage and created the debitage analysis tables. The methodology used for the lithic analysis is largely consistent with that employed by Steve Tomka for analysis of the collection from the Government Canyon SNA (McNatt et al. 2000:95-100). One significant difference is that all bifacial tools that are not projectile points are categorized simply as bifaces, rather than being attributed to functional categories such as knives. Similarly, the edge/use-modified flake is not attributed to function. This does not preclude suggesting functions for some of the specimens within these tool categories, based on factors including morphology and macroscopic use-wear. Evidence of use-wear was examined using a 30x magnification loupe. Edge angles were measured with a contact goniometer.

Chipped Stone Tools

The objectives of the chipped stone artifact analysis were to identify the artifacts to functional or morphological tool categories, and to use the debitage sample to reconstruct raw material acquisition and manufacturing activities. The chipped stone artifacts were divided into nine functional and/or morphological categories: projectile point, biface, scraper, perforator, drill, denticulate flake, modified flake, core, and unmodified debitage. Morphological and/or typological groupings employed in the classification of chipped stone tools are based either on mode of propulsion (i.e., arrow versus dart points), degree of effort expended in tool manufacture (i.e., bifacially flaked versus unretouched tools), or differences in the location of the tool's working edge on the parent material (i.e., end versus side scrapers).

Projectile points are unifacially and/or bifacially flaked stemmed specimens with triangular to leaf-shaped blade segments, sharply pointed distal ends, sharp lateral blade edges, and in many cases, barbed or shouldered proximal blades. Projectile points were divided into arrow points and dart points on the basis of size and weight. In general, specimens with a maximum thickness that does not exceed 4 mm and a maximum neck width less than 11 mm are classified as arrow points. Projectile points that exceed these dimensions are classified as dart points, with a few exceptions. The projectile points were identified to type with reference to established typologies (Turner et al. 2011). Use-broken points lacking features that would have allowed their identification to type are classified as untyped, as are points that are relatively complete but do not conform to any

established type. Points that were broken or abandoned so early in the manufacturing sequence that their stems were not yet formed are classified as preforms, and almost all of them are classified as bifaces.

The 56 chipped stone tools consist of 25 bifaces/fragments, 20 dart points/fragments, five arrow points/fragments, two denticulate tools, one scraper, one drill, one perforator, and one edge-modified flake. Site 41BP882 accounts for most of the chipped stone tools (n=41, 73 percent). Most of the remainder of the chipped stone tool sample was recovered from site 41BP879 (n=8, 14 percent).

Dart Points

Twenty of the chipped stone tools are dart points or dart point fragments. Fifteen of them (75 percent) were recovered from 41BP882, three (15 percent) are from 41BP879, and single specimens were collected from 41BP876 and 41BP877. Eighteen of these points were collected from the surfaces of sites, while two untyped dart points were recovered in shovel tests at 41BP882.

Only two of the dart points are complete. The remainder consist of 13 proximal-medial fragments, two proximal fragments, two distal fragments, and one lateral fragment. All the dart points are made of fine-grained chert. Sixteen dart points are identified to type and four are untyped fragments. The most common types are Ensor (n=4, 20 percent), Castroville (n=2, 10 percent), Golondrina (n=2, 10 percent), and Travis (n=2, 10 percent). The typed dart points are described in alphabetical order.

Attributes recorded during the analysis of projectile points were base and stem treatment, blade treatment, type of shoulders and/or barbs, base morphology, and size. In addition, the presence or absence of usewear and type of fracture were noted. The first four attributes can assist in type identification, and also can be used to identify tool rejuvenation. Seven size measurements were taken: maximum thickness, maximum length, haft/stem length, base depth, maximum blade width, neck width, and base width. Maximum length, maximum blade width, and maximum thickness were measured on complete specimens and fragments with intact parts. Base width, base depth, neck width, and stem length were measured when those parts of projectiles were complete. The metric attributes of the projectile points are presented in Table 6-1.

One Angostura dart point was collected from site 41BP879 (Figure 6-1*a*). These long, slender lanceolate points have narrow bases and ground basal edges (Turner et al. 2011:59). The base and stem edges on this specimen are ground, and the blade is serrated. This specimen had burin spalls removed along both margins, originating at the distal end. No other breakage was noted, suggesting that the point had reached the end of its use life. Possible haft polish was observed along the base and proximal margins. Angostura points are found across most of Texas and date to the late Paleoindian period, with radiocarbon dates ranging from roughly 6850 to 6050 B.C. (Turner et al. 2011:59), although Collins (2004:119) considers this time period to be the beginning of the Early Archaic.

Table 6-1. Projectile Point Metrics.

Type	Site	Haft Length	Maximum Blade Width	Neck Width	Base Width	Base Depth*	Thickness
Dart Points							
Angostura	41BP879	23	19	14	12	0	6
Castroville	41BP882	12	37	22	26	0	7
Castroville?	41BP882	12	30	21	24	-3	8
Darl	41BP882	12	20	12	13	0	5
Ensor	41BP879	10	23	14	24	0	6
Ensor	41BP879	9	25	12	23	1	6
Ensor	41BP882	11	22	16	23	0	7
Ensor	41BP882	11	30	17	27	1	6
Frio	41BP882	11	18	15	21	2	6
Golondrina	41BP882	27	-	27	30	5	7
Golondrina	41BP882	23	-	30	32	5	6
Lange	41BP877	16	41	25	25	0	8
Martindale	41BP882	14	22	14	17	1	9
Travis	41BP882	18	25	18	14	0	7
Travis	41BP882	24	27	18	20	0	10
Wells-like	41BP882	26	32	21	11	0	12
Untyped	41BP882	-	27	-	-	-	7
Untyped	41BP876	-	-	-	-	-	6
Untyped	41BP882	15	28	30	35	35	9
Untyped	41BP882	-	-	-	-	-	-
Arrow Points							
Edwards	41BP879	9	15	6	-	3	5
Perdiz	41BP880	-	20	7	-	-	3
Perdiz (preform)	41BP882	10	20	10	11	-4	3
Scallorn	41BP871	6	-	5	-	0	4
Untyped	41BP881	-	-	-	-	-	4

*Negative base depths are convex

Two Castroville dart points were collected from site 41BP882. Typical Castroville points have a large, triangular body with large barbs, basal notching, an expanding stem, and a straight to slightly concave base (Turner et al. 2011:71-72). One of the Castroville points from 41BP882 has most of these attributes, although the remaining barb is not particularly large (Figure 6-1*b*). The other has no barbs (likely due to breakage or reworking) and a gently convex base, making for a less positive identification (Figure 6-1*c*). Both of these specimens are proximal-medial fragments, with lateral snap fractures at their distal ends. The possible Castroville point has been extensively reworked, had a burin spall removed from one margin at the shoulder, and is rather

asymmetrical. The edges of both of these points are somewhat dulled. Castroville dart points date to the Late Archaic period, between 800 and 400 B.C. (Turner et al. 2011:71-72).

A small, nearly complete Darl dart point was collected from site 41BP882 (Figure 6-1*d*). This specimen has a rectangular stem and straight base, falling within the range of typical Darl morphology (Turner et al. 2011:82). The right blade margin is convex, the left is straighter, and both recurve towards the distal end, suggesting that the point has been reworked. The point is severely burned and calcined. Darl dart points date to the end of the Late Archaic, around A.D. 200 (Turner et al. 2011:82) or later (Collins 2004:113). Radiocarbon assays on samples recovered from recent excavations in and near Bastrop County have yielded much later dates. Darl points were associated with two hearth features at the Shepherd Site (41WM1010) in Williamson County that were radiocarbon dated to A.D. 680 to 890 and A.D. 670 to 880 (Dixon and Rogers 2006:86-87). Features from a Darl component at the McKinney Roughs site (41BP627) returned radiocarbon dates ranging from A.D. 980 to 1380 (Carpenter et al. 2006:89-90, 96-98).

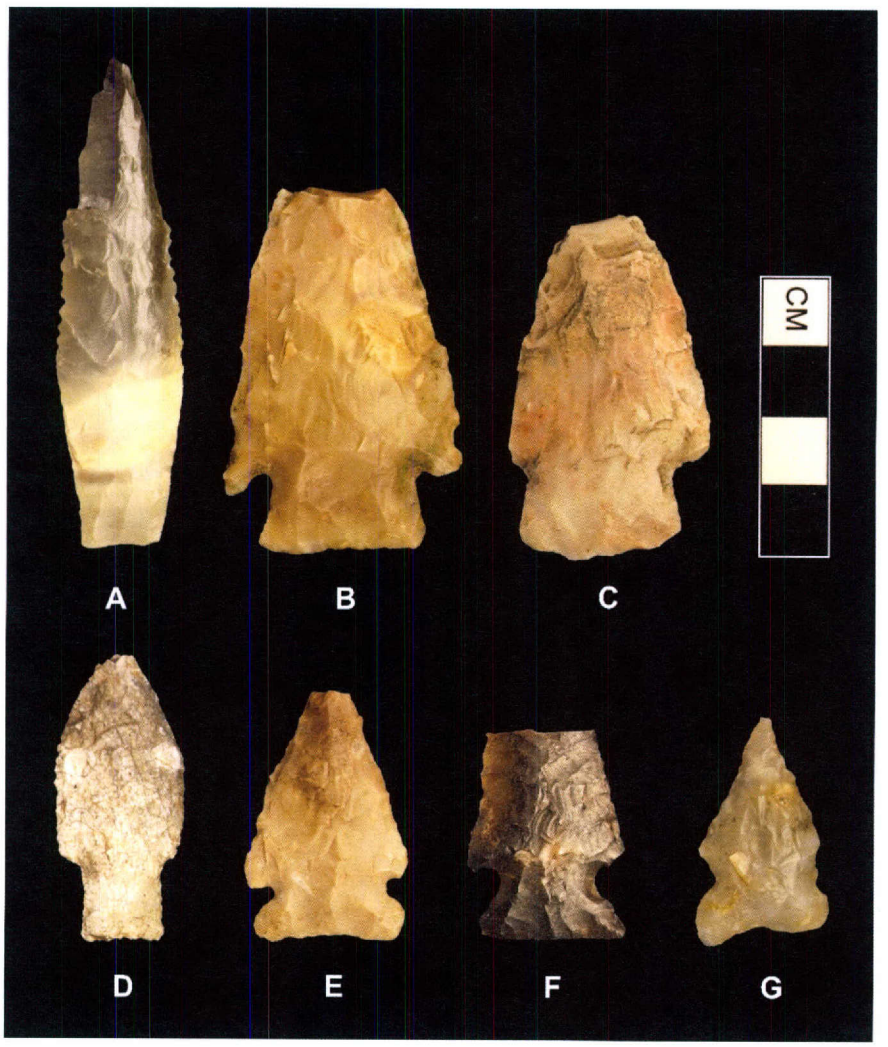

Figure 6-1. Dart points. (*a*) Angostura, 41BP879; (*b, c*) Castroville fragments, 41BP882; (*d*) Darl, 41BP882; (*e, f*) Ensor fragments, 41BP879; (*g*) Frio, 41BP882.

Ensor dart points were recovered from sites 41BP879 (n=2) and 41BP882 (n=2). There is a range of variability in Ensor point morphology, with broad expanding stems and straight bases being the most common elements (Turner et al. 2011:94). There also is variability in notching, with both corner and side notches that may be regional variants (Turner et al. 2011:94). Two of the Ensor points (one from 41BP879 and one from 41BP882) have straight bases (e.g., Figure 6-1*e*), and the other two have shallow concave bases (e.g., Figure 6-1*f*). Three are corner-notched, while the fourth is side-notched. All of the Ensor points are proximal-medial fragments with lateral fractures. Ensor dart points are a key marker of the later part of the Late Archaic period, dating between 200 B.C. and A.D. 600 (Turner et al. 2011:94). A hearth feature from an Ensor component at the McKinney Roughs site yielded a radiocarbon date of A.D. 70 to 150 (Carpenter et al. 2006:94-96).

The Frio dart point from site 41BP882 is complete and has a length of 31 mm (Figure 6-1*g*). This small point has an expanding stem created by side notches and a shallow notched base, typical of this type (Turner et al. 2011:106). The point has been heavily reworked. Frio dart points date to the Late Archaic period, between 200 B.C. and A.D. 600 (Turner et al. 2011:106; Johnson and Goode 1994:36-37).

Two Golondrina proximal fragments were recovered from site 41BP882. Both have deeply concave bases (see Table 6-1), slightly flared basal ears, and heavily ground basal edges, all typical of the Golondrina type (Turner et al. 2011:110-111). One of the points has been reworked into a drill, although the bit has snapped off. The other has a lateral snap fracture just above the shoulders (Figure 6-2*a*). Golondrina points were used during the late Paleoindian period, and have been dated to around 7000 B.C. (Turner et al. 2011:110-111).

A proximal-medial Lange dart point fragment was collected from site 41BP877 (Figure 6-2*b*). It has short barbs, an expanding stem, and a straight base, consistent with the type description (Turner et al. 2011:127). The specimen compares favorably to the Lange points from site 41LK28 (Highley et al. 1995:423-426), although the stem width is at the wide end of the range for those points. Lange dart points were used during the Late Archaic period, and the component that includes those points at 41LK28 was radiocarbon dated to a span of 850 to 550 B.C. (Highley et al. 1995:423; Turner et al. 2011:127).

A Martindale dart point was recovered from 41BP882 (Figure 6-2*c*). This type has short barbs formed by corner notching and an expanding stem with a distinctive fishtail-shaped base (Turner et al. 2011:132). The specimen from 41BP882 is a proximal-medial fragment that lacks barbs due to extensive reworking of the body, but still has a slight fishtail base. The distal break is a lateral snap fracture. The point may have been reworked into a knife, as one margin is concave. Use-related microflaking and polish is evident along this concave margin, while the edge of the opposing margin has been dulled. Martindale dart points date to the late part of the Early Archaic period; proposed age spans differ among the sources. Collins (2004:119) quotes a range between 6850 and 4050 B.C., Turner et al. (2011:132) cite dates from a component at the Smith site

(41UV132) ranging from 4500 to 3000 B.C., and Oksanen et al. (2008:9-1) obtained a series of dates from features associated with Martindale points at the Gatlin site (41KR621) ranging from 3450 to 2650 B.C., while rejecting one date of 4150 B.C. as resulting from a possible localized mixing of sediments from an older, underlying occupation zone.

Two proximal-medial Travis dart point fragments in the collection come from 41BP882 (Figure 6-2*d*). Both points have narrow triangular bodies, convex lateral edges, and weak, rounded shoulders, consistent with the morphology of this type (Turner et al. 2011:165). One originally was thought to be a Nolan point, but it lacks the distinctive stem beveling of this type (Turner et al. 2011:142). Both points have ground stem edges and straight bases, and are very well made. Travis dart points date to the Middle Archaic period, between 2650 and 2050 B.C. (Turner et al. 2011:165).

One proximal-medial fragment identified as Wells-like was recovered from 41BP882. Wells points are long and narrow, and have distinctively long, contracting stems with ground edges (Turner et al. 2011:170). The specimen from 41BP882 has a long, contracting stem and seems to be narrow based on the limited body remnant; the stem edges are not ground, however. The point has a snap fracture. Extensive usewear is visible along the limited lateral edge remnants, including dulling, microflaking, and some polish; possible haft polish also was noted on the stem faces. Wells dart points date to the Middle Archaic, between 4000 and 2500 B.C. (Turner et al. 2011:170).

Four dart point fragments are untyped; three are from 41BP882 and one is from 41BP876. Two distal dart point fragments from 41BP876 and 41BB882 lack features that would allow their placement into typed or untyped subgroups. Two other dart points from 41BP882 do not conform to any named type but have morphological attributes indicating that they served as projectile points. One is a proximal-medial triangular fragment (Figure 6-2*e*). It bears some resemblance to the Golondrina type, but the stem is not parallel-sided and expands too much. The specimen lacks fine flaking, has multiple step fractures, and has sinuous edges, suggesting that it may be a failed dart point preform. The other untyped dart point is a lateral fragment consisting of a shoulder barb and partial stem. The barb is relatively long and was formed by corner notching. The primary break is a lateral snap fracture; the broken specimen was then burned, breaking the point vertically and leaving a large pot lid scar. Dart points date broadly to the Archaic period, between 7050 B.C. and A.D. 750 (Collins 2004:112-113).

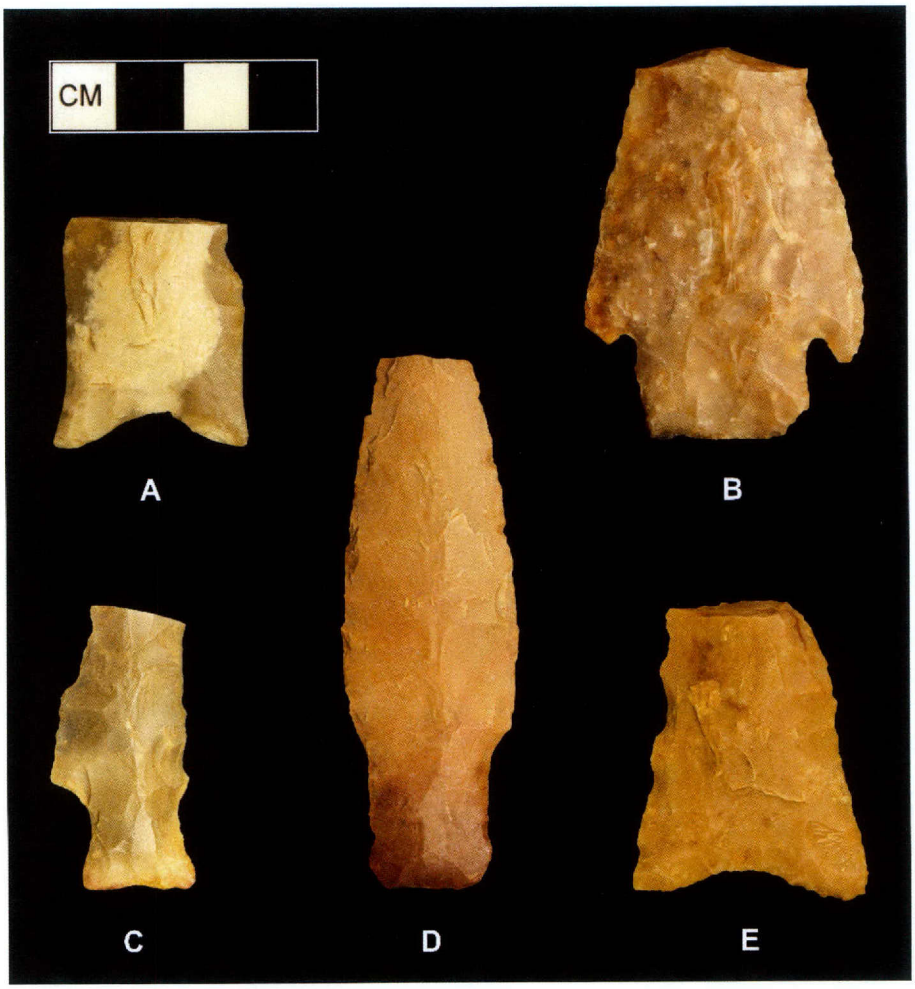

Figure 6-2. Dart points. (*a*) Golondrina fragment, 41BP882; (*b*) Lange fragment, 41BP877; (*c*) Martindale fragment, 41BP882; (*d*) Travis fragment, 41BP882; (*e*) untyped fragment, 41BP882.

Arrow Points

Five of the chipped stone tools are arrow points or arrow point preforms. They were collected from the surface of sites 41BP871, 41BP879, 41BP880, and 41BP882, and from a shovel test at 41BP881. Only one of the arrow points is complete; the remainder consists of two proximal-medial fragments, a medial-distal fragment, and a distal fragment. All the arrow points are made of fine-grained chert. Four of the points are identified to type, while the fifth is an untyped distal fragment. The types are Perdiz (n=2), Edwards (n=1), and Scallorn (n=1). The typed arrow points are described in alphabetical order; see Table 1-1 for metric attributes.

The Edwards arrow point was recovered from 41BP879 in 2013. These large arrow points typically have prominent shoulders or pointed barbs and expanding, deeply divided stems (Turner et al. 2011:170). This specimen is a proximal-medial fragment with a snap fracture; part of the base is also missing. The base is shallowly notched and the stem is expanding. The blade is serrated. Edwards points are thought to be the earliest arrow point form in south and central Texas,

and date to the Austin style interval of the Late Prehistoric period, with radiocarbon dates of A.D. 560 to 1100 (Henderson 2001:277-279).

Two Perdiz points were collected. A Perdiz arrow point was recovered from 41BP880, while a Perdiz preform was recovered from 41BP882. Perdiz points are distinguished by their contracting stems, and they commonly have pointed barbs (Turner et al. 2011:206). They typically are made on flakes or blades, and occasionally are worked on one side only, or minimally flaked on one face. The finished specimen from 41BP880 is a medial-distal fragment that retains a small part of the stem; the stem remnant is contracting, the barbs are pointed, and one face is minimally flaked. The preform from 41BP882 is complete and is 32 mm in length. It appears to be made from a blade flake, and the distal end of the point still has platform and percussion bulb remnants. The specimen has been unifacially worked, with some shaping of the stem area and indentations where the notches would be, consistent with Johnson's (1994:78-80) description of Perdiz preforms and the manufacturing process at the Buckhollow site. Perdiz arrow points date to the Toyah style interval of the Late Prehistoric period, between A.D. 1200 and 1700 (Collins 2004:123).

A Scallorn arrow point was recovered from 41BP871. These are triangular, corner-notched arrow points with well-barbed shoulders and expanding stems (Turner et al. 2011:209). There is some variation in stem and base morphology. This specimen is a proximal-medial fragment with a snap fracture; part of the base and one barb also are missing. The base is straight and slightly irregular. The body is serrated; its small size and narrow width suggests that it was reworked. Scallorn points are the chronological hallmark of the Austin style interval of the Late Prehistoric period, with radiocarbon dates ranging from A.D. 700 to 1200 (Collins 2004:122-123).

One untypable arrow point fragment was recovered from 41BP881. This medial-distal fragment lacks features that would allow placement into typed or untyped subgroups. The thinness of the fragment and limited flaking on one face are indicators that the specimen is an arrow point or arrow preform fragment. This specimen dates to the Late Prehistoric period, between A.D. 700 and 1700 (Collins 2004:122-123).

Bifaces

Twenty-five of the chipped stone tools are bifaces or biface fragments. They are bifacially worked tools that do not have morphological characteristics that suggest a specific tool type, such as projectile points or drills. All but four were recovered from site 41BP882. Of the remaining four bifaces, three were recovered from site 41BP879 and one from site 41BP876. All of these bifaces are made of fine-grained chert. No detailed microscopic usewear analysis was conducted; therefore, the bifaces are not divided into functional categories.

Three size measurements were collected on complete specimens and fragments with intact parts: maximum length, maximum blade width, and maximum thickness. The width and thickness measurements were then used to determine the width/thickness ratio. Other attributes recorded

during the analysis of bifaces were edge angle, completeness, and type of fracture. In addition, the presence/absence of usewear and level of edge sinuosity were noted. Presence/absence of usewear on tools was established through examination under 30x monocular magnification. Working edge angles were measured with a contact goniometer. The metrics and other attributes for the bifaces are presented in Table 6-2.

The bifaces were sorted into early, middle, and late production stages, and finished tools. These categories were determined on the basis of thickness of the specimen, the width-to-thickness ratio, edge sinuosity, edge angle, and presence of usewear (following Andrefsky 2005:187-191; Callahan 1979:9-10, 18, 35-37), while also allowing for individual evaluation by the analyst. A greater width to thickness ratio is an indicator of later stages of reduction, as the tools are being thinned and shaped. Likewise, the thinner late stage bifaces have more acute edge angles and less sinuous edges. Andrefsky (2005:187-188) notes suggested width/thickness ratios and edge angle ranges for particular stages: early stage bifaces have width/thickness ratios of 2.0 to 4.0 and edge angles ranging from 50 to 80 degrees, middle stage bifaces have 3.0 to 4.0 width/thickness ratios and edge angles ranging from 40 to 50 degrees, and late stage and finished tools have width/thickness ratios of 4.1 to 6.0 and edge angles ranging from 25 to 45 degrees. One reason for the similar attributes for late stage and finished tools is that the final stage of reduction primarily involves shaping of hafting elements, notching, and serrations (Callahan 1979:37) as well as fine pressure finishing of edges, which actually reduces the width/thickness ratio as tools are narrowed slightly without impacting the maximum thickness.

It should be noted that many of the bifaces in this collection have been assigned to stages that differ from what their measurements would indicate using Andrefsky's ratios (2005:188). The stage assignment was ultimately determined by visual assessment with some consideration of Andrefsky's guidelines. Certain factors that skewed the width/thickness ratios were accounted for through visual assessment. Thinning failures, such as multiple hinge fractures, will leave areas that are much thicker than the remainder of the tool, resulting in a lower width/thickness ratio. Resharpening of finished tools can also skew width/thickness ratios, as edges are reduced without impacting maximum thickness; this was evident in several of the finished tools.

Three early stage bifaces are included in the collection; all were recovered from the surface of 41BP882. They are complete bifaces, likely abandoned due to thinning failures including step fractures and edge collapse (e.g., Figure 6-3*a*). All are very thick, with width/thickness ratio ranging from 1.7 to 2.7, edge angles of 55 degrees or more, and sinuous edges indicative of early stage reduction. The biface from Lot 1-13 is primarily unifacially worked, and may have been used as a side scraper.

Table 6-2. Biface Attributes (measurements in mm).

Site	Proven-ience*	Length	Width (W)	Thickness (T)	W/T Ratio	Edge Angle (degrees)	Completeness	Stage
41BP876	1-1	-	42	8	5.2	45-50	proximal-medial	late
41BP879	5-1	67	30	12	2.5	43-55	complete	middle
41BP879	9-1	-	21	5	4.4	34-42	proximal-medial	late
41BP879	10-1	-	-	16	-	48-60	medial-distal	middle
41BP882	ST 1	-	-	6	-	42-53	distal	finished
41BP882	1-2	-	-	6	-	38-46	distal	finished
41BP882	1-3	-	-	-	-	45-50	distal	finished
41BP882	1-4	-	-	-	-	45-50	distal	finished
41BP882	1-9	91	50	30	1.7	72-85	complete	early
41BP882	1-10	-	-	11	-	45-53	proximal	finished
41BP882	1-11	-	42	13	3.1	45-52	proximal-medial	finished
41BP882	1-12	70	32	15	2.1	55-74	complete	middle
41BP882	1-13	94	45	17	2.7	55-84	complete	early
41BP882	1-14	-	45	12	3.7	40-50	proximal	late
41BP882	1-15	-	-	6	-	35-44	medial	finished
41BP882	1-16	71	42	20	2.1	60-76	complete	early
41BP882	1-17	45	27	12	2.4	55-75	complete	late
41BP882	1-18	-	29	9	3.3	46-54	proximal-medial	finished
41BP882	1-19	-	-	8	-	56-62	medial	finished
41BP882	1-22	44	19	5	3.6	28-48	complete	late
41BP882	12-1	-	24	8	2.9	37-52	proximal-medial	finished
41BP882	15-1	-	22	8	2.8	45-60	complete	finished
41BP882	18-1	68	31	9	3.4	43-53	complete	late
41BP882	21-1	-	-	11	-	45-53	proximal-medial	late
41BP882	35-1	80	23	6	4.0	30-42	missing distal tip	finished

*ST = Shovel test; remainder are surface finds designated by lot and specimen number

Three middle stage bifaces are included in the collection; two were recovered from 41BP879 (Figure 6-3*b, c*) and one is from 41BP882. One of the bifaces from 41BP879 and the one from 41BP882 are complete; they are relatively large and thick, with width/thickness ratios of 2.6 and 2.1, respectively. Both appear to have been abandoned due to thinning failures, including step fractures and edge collapse. The third middle stage biface is a thick medial-distal fragment from 41BP879 with a perverse fracture suggesting a manufacturing failure.

There are seven late stage bifaces in the collection; four are identified as likely projectile point preforms. Three of these were recovered at 41BP882 and the fourth came from 41BP879. Preforms are generally identifiable as small, pointed ovate bifaces that lack fine flaking along the edges. The three arrow point preforms are smaller and thinner, and may be only partially worked

on one face. Two of them (41BP879 Lot 9-1 and 41BP882 Lot 1-22) have width/thickness ratios greater than 3.5 and edge angles of less than 50 degrees, while the third arrow point preform (41BP882 Lot 1-17) has a lower width/thickness ratio and steeper edge angles. Both of the specimens from 41BP882 are complete (e.g., Figure 6-3d), but have thinning failures that likely led to their abandonment. The specimen from 41BP879 (Figure 6-3*e*) is a proximal-medial fragment with a perverse fracture that likely was a manufacturing failure. The final preform (41BP882 Lot 18-1) is a complete specimen with large knots at the base resulting from thinning failures, which likely led to its abandonment (Figure 6-3*f*). Based on the size, it probably is a dart point preform.

Figure 6-3. Bifaces and biface fragments. (*a*) early stage, 41BP882 Lot 1-9; (*b*, *c*) middle stage, 41BP879 Lots 5-1 and 10-1; *(d)* late stage, probable arrow point preform, 41BP882 Lot 1-22; *(e)* late stage, probable arrow point preform, 41BP879 Lot 9-1; *(f)* late stage, possible dart point preform, 41BP882 Lot 18-1; (*g*) late stage, 41BP876 Lot 1-1; (*h)* late stage, 41BP882 Lot 21-1.

The late-stage biface from site 41BP876 is a proximal-medial fragment with a concave, possibly notched base (Figure 6-3*g*). The shape does not suggest it was intended to be a projectile

point. This tool has a high width/thickness ratio of 5.20, yet the edges are sinuous and lack fine flaking, suggesting that it is an unfinished tool. The late stage biface from 41BP882 Lot 14-1 is a curved proximal-medial fragment with an irregular base. There is a large knot formed by multiple step fractures on one face, in the location of a coarse-grained inclusion. Finally, a proximal-medial late stage biface from 41BP882 has shallow side notches and a thinned, ground base (Figure 6-3*h*). The width of the specimen could not be measured due to a perverse fracture, but it is relatively thick (11 mm), with slightly sinuous edges that lack fine flaking.

The 12 remaining bifaces and fragments are finished tools or probable finished tools; all were recovered from site 41BP882. Only one is complete, one is missing the distal tip, four are distal fragments, three are proximal-medial fragments, one is a proximal fragment, and two are medial fragments. The width/thickness ratio could not be determined for seven of the fragments, and ranged from 2.8 to 4.0 for those that could be measured. The lower numbers are likely skewed by resharpening of tools, which generally causes the body to become narrower without substantially changing the thickness. Edge angles of the finished bifaces range from 30 to 62 degrees. The complete specimen is heavily resharpened, and has a distal fracture that was reworked into a scraper bit (Figure 6-4*a*). The nearly complete biface was collected in 2013. It is extremely thin and well made (Figure 6-4*b*), and has been identified as a Gahagan biface, a formal knife dating to the Late Prehistoric period (Turner et al. 2011:230). The two medial fragments (e.g., Figure 6-4*c*) and one of the distal fragments may be projectile point fragments, based on morphology and thinness. The proximal finished biface has signs of polish on both faces (Figure 6-4d), suggesting that it was fastened into a haft for use. Most of the finished bifaces likely were used as knives.

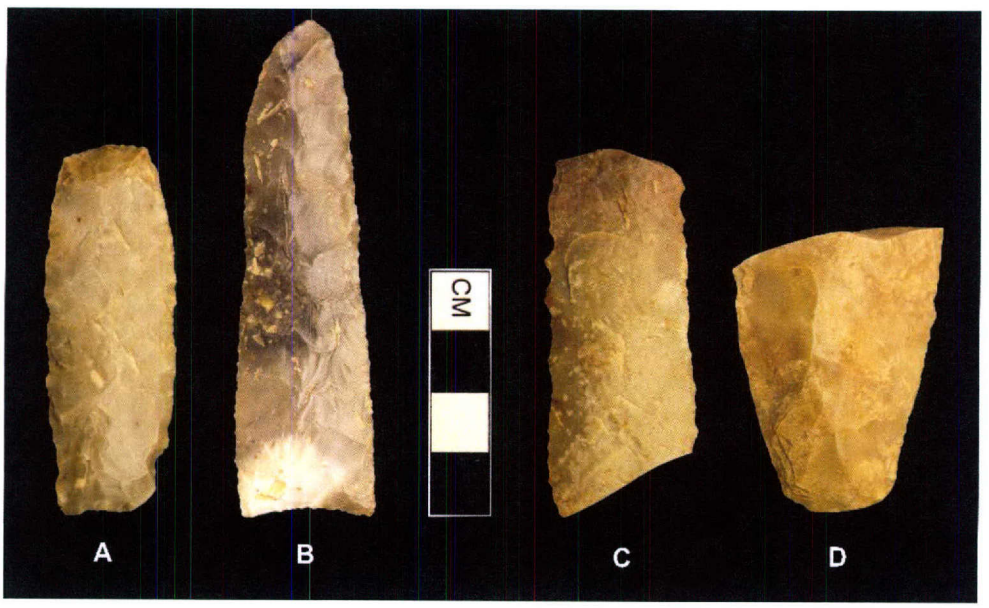

Figure 6-4. Finished bifaces and biface fragments. (*a*) Break reworked into a scraper bit, 41BP882 Lot 15-1; (*b*) formal knife/Gahagan biface, 41BP882 Lot 35-1; (*c*) possible projectile point medial fragment, 41BP882 Lot 1-15; (*d*) proximal fragment, 41BP882 Lot 1-10

Scraper

A scraper was recovered from the surface of 41BP882. It is a side scraper made of a milky, fine-grained chert with a texture that somewhat resembles novaculite. It is made on a cortical flake with more than 50 percent of the cortex still present; the working edge and the area above it lack cortex. The tool is somewhat formally shaped; an effort was made to thin the bulb of percussion adjacent to the working edge, which is located on the left proximal margin. This tool is relatively small (56 mm long, 39 mm wide, and 17 mm thick), with a working edge angle that ranges from 70 to 80 degrees. The height of retouch (longest flake scar on the working edge) is 11.66 mm, which results in a Kuhn's Index of Reduction of 0.67, suggesting that the scraper has been resharpened but is not exhausted (Kuhn 1990:585, 588-590). The bit is use-worn and the edge appears to be lightly ground, possibly from resharpening. Microscopic (60x) examination of the ventral face shows some areas of use polish as well as one area with several parallel striations extending perpendicular to the working edge.

Drill

One possible drill was recovered from the surface of 41BP882. This is a bifacial tool made on a fine-grained chert flake blank. The specimen has an irregular basal shape that possibly was intentionally made to assist with gripping the tool. The lateral margins of the base are recurved, while the possible drill bit margins are contracting rather than parallel. The tool is 62 mm long, 37 mm wide, and 11 mm thick; the bit section is 32 mm long. Most of the fine retouch along the bit is on one face; one margin of the opposite face is minimally retouched. The bit is not beveled, although one margin has an edge angle of 55 degrees and the other ranges from 60 to 65 degrees. Light polish is found along the margins on both faces of the blade, extending roughly 12 mm from the tip. Microflaking is present on both faces of the tool but is more prominent on the face that has been more extensively retouched.

Perforator

One perforator was collected from the surface of site 41BP882. This specimen is made on a coarse-grained chert secondary flake. The perforator bit is located at the proximal end of the flake, where the platform would have been; it is possible that the tool was made on a broken flake. The bit was formed by minimal flaking on alternate left margins, with more flaking on one face. The tool is 47 mm long, 53 mm wide, and 14 mm thick, and the bit is 10 mm long. Usewear consists of abrasion on one retouched margin and some very small areas of polish on part of the tip.

Denticulate Flakes

Two denticulate (serrated) flake tools were collected from the surfaces of sites 41BP879 and 41BP882. The tool from 41BP879 has 18 small teeth in a row along the right lateral margin, extending along a 50 mm length. Interestingly, the serrations are on the cortical margin of this fine-grained chert secondary flake. The flake is 63 mm long, 43 mm wide, and has a maximum

thickness of 10 mm at the bulb of percussion; the longest projection is 0.75 mm long and 1.30 mm wide. There is polish along the use margin on both faces, especially the ventral face, and many of the teeth are worn down, indicating that the tool was used intensively.

The denticulate flake tool from 41BP882 has serrations along both lateral margins, with six on one margin and seven on the other. The projections are longer (all greater than 1 mm long) and wider (ranging from 2.5 to 3.0 mm) than those on the specimen from 41BP879. One margin is concave, and has flatter (or more worn) projections, while the opposite margin is convex with pointed projections. The tool is made on a fine-grained chert secondary flake with a very small area of cortex in one corner; it measures 55 mm long, 38 mm wide, and 7 mm thick. Very light edge wear, minor microflaking, and extensive polish were observed along both margins, on both faces.

Denticulate flake tools have been recovered from Archaic and Late Prehistoric components in a number of sites in Bastrop County and vicinity. Two denticulate flake tools were recovered during amateur excavations at 41BP19, the Kennedy Bluffs site (Bement et al. 1989:140, 145), which is on Alum Creek roughly 8.8 km south of 41BP882 and only 4.7 km south of 41BP879. Ten denticulate flake tools were recovered during testing and data recovery excavations at the Bull Pen site (41BP280), which is immediately adjacent to the Kennedy Bluffs site (Goode 1986:22-23; Ensor and Mueller-Wille 1988:146-148). Serrated flakes were recovered from Late Prehistoric components at the Sandbur site (41FY135) in Fayette County (Kalter et al. 2005:93, 95) and the Toyah Bluff site (41TV441) in eastern Travis County (Karbula et al. 2001:A-25, A-27). Two serrated flakes were recovered from the Loeve-Fox site (41WM230) from strata associated with Late Archaic occupations (Prewitt 1981b:17, 140). Four serrated flakes were recovered from Kyle Shelter (41HI1) in Hill County, roughly 150 miles north of Bastrop State Park (Jelks 1962:50). Three of them were recovered from deposits that dated to the Austin style interval of the Late Prehistoric period, and Jelks considered serrated flakes to be a trait of that period (Jelks 1962:50, 86). Although they typically exhibit extensive usewear, the function of denticulate flake tools has not been determined.

Modified Flakes

An edge-modified flake was recovered from a shovel test at site 41BP881. It is a medium-grained fossiliferous chert flake fragment, missing the distal end and one lateral margin. The worked edge is 12 mm long and located along the ventral face, adjacent to the flake platform. The tool appears to be an expedient scraper, based on the 61 to 69 degree edge angle and flatness of the single-facet platform on the opposite side of the modification. Very light microflaking was noted on the flaked edge.

Cores

Cores are raw material from which flakes and blades are removed for use as tools or as blanks for formal tools. Six cores/fragments and one tested cobble are included in the collection.

The degree of reduction of each core was approximated by recording its overall dimensions, the percentage of cortex retained, and the number of complete or partial flake facets.

Three cores were recovered from site 41BP882; all are made of fine-grained chert and retain less than 50 percent cortex. Two multi-directional cores were recovered from shovel tests. One is a very small core (22 mm long, 24 mm wide, and 19 mm thick) that has five flake scars and is essentially flaking shatter. The other is likely exhausted, based on its relatively small size (55 mm long, 42 mm wide, and 31 mm thick) and high number of flake scars (n=9). One bifacial core was collected from the site surface. It is a tabular chert cobble and measures 115 mm long, 80 mm wide, and 43 mm thick. It has 13 flake scars, including several long, deep scars. Two small areas of polish on the cortex are probably natural. These cores do not exhibit evidence of burning or heat treatment.

The core recovered from a shovel test at site 41BP875 is a medium-sized (73 mm long, 52 mm wide, and 35 mm thick), multi-directional core of fine-grained, banded chert. The specimen is reddened but not heavily burned, suggesting that it may have been heat treated. It retains two small patches of cortex. The size and high number of flake scars (n=9) suggests that this core was exhausted, or nearly so. Two possible core fragments were recovered from shovel tests at sites 41BP877 and 41BP878. Both are small, multidirectional, and composed of fine-grained chert.

The seventh core is a bifacial tested cobble recovered from a shovel test at site 41BP874. It is composed of medium-grained chert with some fine-grained inclusions, and measures 94 mm long, 109 mm wide, and 51 mm thick. The cortex on the round cobble is rough and pitted, suggesting that it originated from a local gravel outcrop rather than a creek bed. Two flakes have been removed from one face, and four flakes have been removed in the same direction from the opposing face; three of these are along the same margin. The result is a crude, pointed edge that could have been used for chopping or cleaving, although no obvious usewear was observed along the edge. This tested cobble is somewhat similar to two bifacial tools collected in Bastrop State Park in 2011 (McNatt 2012:7-8); those tools have significantly more flake removals, appear to have been at least somewhat shaped, and exhibit extensive usewear, however (Himes 2013).

Debitage

The debitage sample consists of 656 pieces recovered from shovel tests dug during the current investigations and one shovel test dug at 41BP882 in 2008 (Table 6-3). The sample was obtained from 43 shovel tests at 12 sites. Two are lithic procurement sites (41BP873 and 41BP874), three are lithic scatters (41BP872, 41BP877, and 41BP879), and seven are open campsites (41BP871, 41BP875, 41BP876, 41BP878, 41BP880, 41BP881, and 41BP882).

The largest sample (n=147) comes from 41BP881, comprising over 22 percent of the debitage; nine shovel tests were excavated at this site, more than all but one other site. Another large sample was recovered from two shovel tests at 41BP875 (n=115, 25 percent). A single shovel test at site 41BP881 yielded 57 pieces of debitage, comprising 12 percent of the overall

sample. Thirty-seven percent of the debitage (n=171) is spread relatively evenly across seven sites: 41BP871, 41BP874, 41BP876, 41BP877, 41BP878, 41BP879, and 41BP880, with totals ranging from 11 to 35 pieces of debitage. Finally, two sites (41BP872 and 41BP873) are primarily of historic age; a single piece of debitage was recovered from each of them.

Table 6-3. Debitage Completeness.

Site	Complete	Proximal	Chip	Angular Debris	Total
41BP871	11	3	11	4	29
41BP872	1	-	-	-	1
41BP873	1	-	-	-	1
41BP874	8	-	2	5	15
41BP875	61	21	31	2	115
41BP876	11	5	5	3	24
41BP877	17	10	26	16	69
41BP878	28	15	39	5	87
41BP879	13	9	10	1	33
41BP880	6	1	4	-	11
41BP881	41	35	57	14	147
41BP882	60	25	35	4	124
Total	258	124	220	54	656
Percent	39.3%	18.9%	33.5%	8.2%	

The objectives of the debitage analysis were to assess the types of lithic reduction activities and manufacturing processes that were occurring at various types of sites. Widespread upland gravel deposits in the park provide workable raw materials for making chipped stone tools in a range of colors and qualities (see Environmental Background), and a number of lithic procurement sites have been recorded at the park (see Prehistoric Background).

First, the debitage was sorted by raw material type. All but one of the specimens was chert, and overwhelmingly the material was fine-grained. The sole exception is a quartzite flake from 41BP876. The debitage was then sorted into complete flakes, proximal flake fragments, flake fragments, and angular debris. Complete flakes have a platform and a distal termination, while proximal flake fragments retain platforms but lack distal terminations. Flake fragments are medial or distal fragments with observable ventral and dorsal sides. Angular debris exhibits patterned, faceted surfaces with flake scars bearing ripples and/or negative bulbs of percussion. Only complete flakes were used in the size and cortex analyses.

Complete flakes were measured by superimposing them on a diagram of concentric circles drawn in 10 mm increments. They were then sorted by percentage of dorsal cortex retained: 100 percent, greater than 50 percent, less than 50 percent, or none. Only rough, weathered surfaces

were designated as cortical. Evidence of burning was also noted. Dominant color initially was proposed as an analytical category, but was not used due to the variety of colors of chert in the upland gravel deposits.

The debitage is composed of 40 percent complete flakes, 33 percent flake fragments, 19 percent proximal flakes, and 8 percent angular debris (see Table 6-3). An overwhelming percentage (83 percent) of the complete flakes are tertiary flakes, lacking dorsal cortex (Table 6-4). Secondary flakes that retain some dorsal cortex comprise just over 15 percent of the sample. Primary flakes with cortex that covers the entire dorsal surface comprise only 2 percent of the complete flake sample.

Table 6-4. Complete Flake Dorsal Cortex.

	Primary		Secondary		Tertiary		
Site	#	%	#	%	#	%	Total
41BP871	0	0.0	3	27.3	8	72.7	11
41BP872	0	0.0	0	0.0	1	100.0	1
41BP873	0	0.0	1	100.0	0	0.0	1
41BP874	1	12.5	4	50.0	3	37.5	8
41BP875	0	0.0	8	13.1	53	86.9	61
41BP876	0	0.0	2	18.2	9	81.8	11
41BP877	2	11.8	4	23.5	11	64.7	17
41BP878	0	0.0	3	10.7	25	89.3	28
41BP879	0	0.0	4	30.8	9	69.2	13
41BP880	0	0.0	0	0.0	6	100.0	6
41BP881	1	2.4	4	9.8	36	87.8	41
41BP882	1	1.7	7	11.7	52	86.7	60
Total	5	1.9%	40	15.5%	213	82.6%	258

The measures of complete flake size show that a slight majority of the complete flakes (55 percent) are small, measuring less than 25 mm in maximum dimension (Table 6-5). The second largest size category is 25 to 44 mm in maximum dimension, comprising over 34 percent of complete flakes. Only 3 percent (n=6) of the complete flakes are greater than 65 mm in maximum dimension; the largest flakes are from 41BP874 and 41BP875, and have maximum dimensions of 90 and 100 mm respectively.

Table 6-5. Complete Flake Size.

	1-24		25-44		45-64		65-84		85-104		
Site	#	%	#	%	#	%	#	%	#	%	Total
41BP871	6	54.5%	4	36.4%	1	9.1%	-	-	-	-	11
41BP872	-	-	1	100.0%	-	-	-	-	-	-	1
41BP873	-	-	-	-	1	100.0%	-	-	-	-	1
41BP874	1	12.5%	6	75.0%	-	-	-	-	1	12.5%	8
41BP875	34	55.7%	17	27.9%	8	13.1%	1	1.6%	1	1.6%	61
41BP876	7	63.6%	3	27.3%	-	-	1	9.1%	-	-	11
41BP877	9	52.9%	6	35.3%	1	5.9%	1	5.9%	-	-	17
41BP878	15	53.6%	11	39.3%	2	7.1%	-	-	-	-	28
41BP879	6	46.2%	3	23.1%	3	23.1%	1	7.7%	-	-	13
41BP880	4	66.7%	1	16.7%	1	16.7%	-	-	-	-	6
41BP881	27	65.9%	12	29.3%	2	4.9%	-	-	-	-	41
41BP882	32	53.3%	25	41.7%	3	5.0%	-	-	-	-	60
Total	141	54.7%	89	34.5%	22	8.5%	4	1.6%	2	0.8%	258

The samples from the two lithic procurement sites differ slightly from the samples from the lithic scatters and open camps. Site 41BP873 produced a single secondary flake that is moderately large. The sample from 41BP874 consists of 15 pieces of debitage, including eight complete flakes. Five of the eight flakes (63 percent) retain some dorsal cortex, which is a much higher percentage of corticate flakes than in the samples of complete flakes from the other sites (see Table 6-4). The single quartzite flake was recovered from this site. It is also one of the three sites where complete primary flakes were recovered (see Table 6-4). Although the range of complete flake sizes at 41BP874 does not differ greatly from the other sites, it is one of the two sites that yielded very large flakes (see Table 6-5).

In summary, the vast majority of the complete flake sample lacks dorsal cortex. The predominance of debitage without cortex and the relatively small size of flakes suggest that most of the lithic reduction conducted at lithic scatters and open campsites was middle and late stage stone tool manufacturing. Most of the chipped stone artifacts apparently were brought to those sites in partially finished form. The initial stages of lithic reduction probably took place at lithic procurement sites like 41BP874.

Ground Stone Artifacts

Five manos/mano fragments were recovered from five different sites; all of them are made of quartzite. The mano fragments from 41BP875 and 41BP880 were recovered from shovel tests, and the mano fragment from 41BP882 was collected from the surface. These three specimens are small and have one smooth planar face and one rounded face. The fragments from 41BP875 and 41BP880 are whitish to light pink, very coarse-grained quartzite, while the one from 41BP882 is dark red medium-grained quartzite.

The mano collected from the surface of site 41BP878 is roughly 70 percent complete, and has large pieces missing from two sections. It is composed of whitish, very coarse-grained quartzite, and has a planar use face and a rounded obverse face. It measures 83 mm wide and 47 mm thick. The mano was damaged by the wildfire, and the use face is blackened in some areas. A few linear striations are evident under magnification, however, and the use face has been smoothed.

A mostly complete mano was recovered from the surface of site 41BP881. One margin is missing, possibly from fire damage; there are also two gouged areas that appear to be vehicle or equipment damage. This mano measures 75 mm long and 31 mm thick and is made from a dense, reddish, somewhat coarse-grained quartzite cobble. There is one rounded face and one irregular, slightly concave face. This irregular face is blackened by fire, but appears to have one very level, smooth working area with possible areas of polish. The rounded face also is very smooth and has some areas of polish, suggesting that this face also was used for grinding. One margin also is very flat and smooth, indicative of a facet that often forms on the proximal edge of a mano (Adams 2002:103-106, 108).

The single metate is a massive sandstone slab collected from the surface of site 41BP882. It is 48 cm long, 38 cm wide, and 11 cm thick, and weighs over 19 kg. There is a work surface measuring approximately 38 cm long by 26 cm wide on one face, forming a very shallow basin that is roughly 3 to 4 mm deep. The basin surface is extremely smooth, although some areas appear to have been pecked to rejuvenate it. No other surfaces are worked, and the obverse face of the slab is highly irregular with several large cavities. The metate is burned, possibly by recent fires. As a result, the metate is reddened, has several cracks across the body, and has spalls along one edge.

Other Prehistoric Materials

The other prehistoric materials in the collection are 18 fire-cracked rocks and seven organic fragments. As noted in the methods section, fire-cracked rocks were defined as being of human origin when they consisted of quartzite or sandstone, which fractures at higher temperatures like those found in repeatedly used campfires. Fire-cracked rocks were recovered from shovel tests at sites 41BP876, 41BP880, and 41BP882. One piece of quartzite fire-cracked rock was recovered from the test at 41BP876. Seven pieces of fire-cracked rock from 41BP880 were recovered from

75 cm below surface, and are considered to be from a probable hearth. Three of the rocks are quartzite pieces that refit, and four are sandstone rocks that appear to be burned. Ten fire-cracked rock fragments were recovered from two shovel tests at 41BP882; eight are quartzite, one is sandstone and one is chert.

The organic fragments are seven burned nutshell fragments recovered from 40 to 60 cm below surface in a shovel test at 41BP882. These small fragments are likely part of the same nutshell, and total less than 1 g. They are presumed to be of prehistoric age due to their recovery from a moderate depth in a shovel test, and their charred appearance. The presence of natural burned chert in the same level may indicate that the nutshell was incidentally burned by a natural fire, however. The nutshell fragments were too small to identify to species.

HISTORIC ARTIFACTS

Twenty-two historic artifacts are included in the collection: nine shaped glass bottles or fragments, seven ceramic sherds, five metal items that are building materials or auto parts, and one piece of flat glass. These artifacts were collected from the surface of sites 41BP872 (n=2), 41BP873 (n=7), and 41BP882 (n=2), and from a shovel test at 41BP872 (n=11). The artifacts that can be definitively dated are from the late nineteenth and early twentieth centuries. Former Texas Parks and Wildlife Department archeologist Art Black provided substantial assistance in identifying the kerosene auto lamp.

Glass

The 10 glass artifacts consist of eight fragments (six clear and two solarized), and two complete bottles or bottle fragments (one clear and one olive). A complete, clear-molded glass bottle with a sprinkler top and a Bakelite plastic screw-on cap was collected from 41BP873. Sprinkler top bottles have a narrow, tapered screw thread finish and a constricted mouth or bore, which restricts the flow of liquid (Lindsey 2013). The bottle base is marked with a 6, and has no other maker's marks. The lid interior has a maker's mark from the Owens Illinois Glass Company, the numbers 20-400, 68, and 10, while the Chesebrough Manufacturing Company logo is on the exterior top. Bakelite plastic bottle closures were introduced in 1927, and the sprinkler top finish was not introduced until the early 1920s (Lindsey 2013). The bottle held Vaseline Hair Tonic, as Vaseline was Chesebrough's primary product (Drake Well Museum 1996); advertisements from as late as 1950 show a bottle identical to the one from site 41BP873 (JonWilliamson.com 2013).

A partial olive glass bottle, missing the bottom and part of the neck and lip, was collected from 41BP873. The neck is not threaded, and the bottle would have had a stopper closure, most likely a cork. This shape and color of bottle is commonly referred to as a Bordeaux type wine bottle, which likely dates as far back as the early nineteenth century, but continues through the present (Lindsey 2013). The lack of side seams along with horizontal rings on the neck and body indicate that the bottle was produced using the turn-mold method, most common from 1880 to 1920 (Newman 1970:72-75).

Two solarized glass fragments were collected from 41BP873. One piece is a partial base fragment, and the morphology suggests it is from a rectangular bottle. Solarized glass was manufactured between 1880 and 1916, when manganese was used to decolor clear glass (Munsey 1970:55). The purple color is produced when the manganese reacts with the sun's ultraviolet rays.

The clear vessel glass sherds consist of five fragments recovered from the shovel test at site 41BP872. Two are are not patinated, and could be of recent age; two others are patinated and might be older. One of these has a faint purplish tint, indicating it may have been decolored with manganese, thus dating its manufacture between 1880 and 1916 (Munsey 1970:55). One piece of shaped clear glass is from a lamp chimney, as it is very thin and slightly curved. The fragment is patinated.

One patinated clear flat glass fragment was recovered from the shovel test at site 41BP872. It appears to be a window glass fragment. It has a slightly greenish appearance, possibly due to the patination. The fragment is 2.02 mm thick, and falls between 1873 and 1885 in Moir's (1987:80-81) regression formula based on progressive increase in window glass thickness between 1810 and 1915, although a single piece is not an adequate sample.

Ceramics

Seven historic ceramic sherds were collected from sites 41BP872, 41BP873, and 41BP882. Three are sponge decorated white earthenware fragments, two are plain white earthenware fragments, one is a white earthenware fragment with a decal decoration, and one is a green glazed earthenware fragment.

Two plain white earthenware fragments were recovered from the shovel test at site 41BP872. The sherds are from plain vessels or undecorated areas of decorated vessels. Both are flat and appear to be from a plate or saucer, possibly the same dish as they have the same color, paste, and thickness, but the fragments do not refit. White earthenware sherds were first manufactured in the 1820s and continued to be made and used well into the twentieth century (Miller 1980:2-3, 1991:1; Moir 1988:253).

One white earthenware sherd with a decal decoration was collected from the surface of site 41BP872; it is from the rim of a plate or a saucer. The decal depicts pink flowers with green leaves and a blue feather or feathers. The rim is trimmed with a gilt band, and the edge may be slightly scalloped. Decalcomania decoration became a common decorative technique beginning around 1890, and was most popular in Texas in the late nineteenth and early twentieth centuries (Majewski and O'Brien 1987:146-147; Miller et al. 2000:13; Moir 1988:257, 260).

Three white earthenware fragments with sponge decoration were collected at site 41BP873, and appear to be from a plate or saucer. The three sherds may be from the same set based on their color and paste, as well as their green color. One rim and base sherd has a strawberry motif, with red berries, gray seeds, and green leaves; the gray color appears to have been applied on top of the

glaze. The other two fragments are a rim sherd and a possible base sherd, both with green leaves. The sherds could be from the same dish, they but do not refit. Sponge decoration became a common decorative technique beginning in the late 1840s, and continued through 1930 (Miller 1991:6; Miller et al. 2000:13). The motifs are not temporally diagnostic and the sherds cannot be dated to a narrow time frame.

The green glazed earthenware sherd was collected from site 41BP882. Its paste is tan, is relatively coarse, and appears porous. Both surfaces of the sherd are covered with green glaze, and the slightly concave surface has a faint white line. The sherd may be from a plate or saucer. The sherd is small and lacks maker's marks, and cannot be dated.

Metal

The historic metal artifacts are three wire nails, one square nail, and one kerosene auto lamp. All of the metal artifacts are ferrous. Two complete wire nails and one wire nail fragment were recovered from the shovel test at site 41BP872. Production of wire nails in the United States started in the 1860s, but they did not dominate the market until the 1890s, after which time they became ubiquitous (Nelson 1968:9-10).

One square cut, machine made nail was collected from 41BP882. This nail has a relatively thin, slightly rounded head. This type of ferrous nail was first manufactured in the early nineteenth century (Edwards and Wells 1993:9), but similar nails are still made today (Nelson 1968:9). This specimen resembles Type 8 in the Louisiana Nail Chronology, which is the most common type and saw widespread usage from 1820 to 1891 (Wells 1998:91-92, 95).

The kerosene auto lamp was collected from site 41BP872. Kerosene lamps were used on automobiles in the early years of production, prior to the development of electric lighting. This lamp is a side lamp for the Ford Model T, and dates between 1916 and 1926 based on its shape and lack of brass trim (Model T Ford Club of America 2016).

SUMMARY

Of the 772 artifacts in this collection, 750 (97 percent) are prehistoric and 22 (3 percent) are historic. The prehistoric artifacts consist of 656 pieces of debitage, 31 chipped stone tools other than projectile points, 25 projectile points and fragments, 18 fire-cracked rocks, seven cores, and six ground stone tools. Seven nutshell fragments were also collected but may be natural in origin. The chipped stone artifacts are made of fine- to medium-grained chert, with the exception of one quartzite flake. The ground stone tools are made of quartzite and sandstone. These materials probably were obtained from hilltop gravel deposits and sandstone outcrops within the park.

The most abundant artifact class is debitage, which comprises 85 percent of the collection. The 258 complete flakes are predominantly tertiary (83 percent) and less than 44 mm in maximum

dimension (89 percent). Differences in the attributes of debitage samples indicate that the initial stages of reduction took place at lithic procurement sites, while the middle and late stages of lithic reduction were conducted at lithic scatters and open campsites.

Twenty-one of the dart points are identified to type and can be associated with particular time periods. Almost half of them (n=9, 43 percent) date to the Late Archaic period (Castroville, Darl, Ensor, Frio, and Lange dart points). The Late Prehistoric period is represented by five arrow points that comprise 24 percent of the sample; four of them are typed as Edwards, Perdiz, or Scallorn. Three dart points (Travis and Wells-like) date to the Middle Archaic period and comprise 14 percent of the sample of datable projectile points. The Early Archaic period is represented by a single Martindale dart point. Two Golondrina and one Angostura dart point date to the late Paleoindian period, and comprise 14 percent of the datable dart points. Overall, the projectile point sample spans a period of nearly 9,000 years, ranging from 7000 B.C. to A.D. 1700. The only time periods that are not represented in the sample are the early and middle Paleoindian periods.

The sample of non-projectile chipped stone tools is not fully representative of the activities that took place on the sites, as these artifacts were only collected from the surfaces of sites when they were thought to be at risk of loss. Nevertheless, it is clear that all stages of biface reduction took place on site 41BP882, an open campsite where 21 bifaces were collected. The tasks represented by the 31 chipped stone tools include cutting, scraping, drilling, and perforation. Although the two denticulate flake tools from 41BP879 and 41BP882 are well-worn, their function is unknown.

Ground stone tools were recovered from five sites (41BP875, 41BP878, 41BP880, 41BP881, and 41BP882) and two of them (41BP880 and 41BP882) also produced fire-cracked rocks, resulting in their classification as open campsites. Site 41BP876 also is classified as an open campsite based on the recovery of one piece of fire-cracked rock. Fire-cracked rocks were observed at another open campsite (41BP871) but are not included in the collection. The ground stone tools are quartzite manos and one large metate made of sandstone. Their presence indicates that food processing took place at these sites.

Twenty of the 22 historic artifacts come from habitation site 41BP872 and dump site 41BP873. A ceramic sherd and a nail collected from site 41BP882 indicate a transitory historic presence at that site. The majority of the historic artifacts are fragments of bottles and plates that represent household activities like food and beverage consumption, and grooming. Building materials include a piece of window glass and square and wire nails. A lamp chimney fragment indicates that the occupation at 41BP872 probably predated rural electrification. A kerosene side lamp from a Model T automobile sheds light on historic transportation. Most of the historic artifacts cannot be dated precisely, but the spans of manufacture and use of a few items extend back to the late nineteenth and/or early twentieth centuries: a decal-decorated white earthenware sherd (1890 to early twentieth century), two solarized glass vessel fragments (1880 to 1916), a

Vaseline hair tonic bottle (1920 to 1950), a turn-mold wine bottle fragment (1880 to 1920), and the Model T side lamp (1916 to 1926).

7. MANAGEMENT PLAN FOR ARCHEOLOGICAL RESOURCES

by Margaret Howard and John Lowe

The current investigations support protection and management of the 12 archeological sites recorded in Bastrop State Park during this investigation. Data on the significance of these archeological sites allow for priorities to be established for protection of the sites that are most significant and/or threatened. If changes in the levels of activity or uses of particular areas of the park are contemplated, these data allow for evaluation of the potential benefits or losses to archeological sites that may result. If development of additional park facilities should be required within the survey area, this information will focus scoping efforts on areas where damage to significant archeological sites is least likely to occur, potentially minimizing costs and time delays. The findings of this report also enhance the ability to interpret the history of Bastrop State Park for the public.

This section opens with a review of the laws and regulations that mandate stewardship of cultural resources on properties owned by the Texas Parks and Wildlife Department (TPWD). The significance of the 12 archeological sites recorded on Bastrop State Park during this investigation and their merit for official designation are then reviewed. Causes of damage and potential damage to archeological sites on the park are next considered, including natural processes, operation and visitation impacts, and construction and maintenance activities. Procedures are provided for addressing these impacts in compliance with state law and agency policy. Management priorities and recommendations for the 12 archeological sites are then presented. Procedures are summarized for the accidental discovery of archeological sites in the park. The section concludes with recommendations for future archeological investigations.

MANDATE FOR ARCHEOLOGICAL SITE PRESERVATION

The stewardship role of the TPWD toward archeological and historic resources on lands owned or controlled by the Department is defined in the Antiquities Code of Texas (Texas Natural Resource Code, Title 9, Chapter 191), which calls for the location and protection of all archeological sites on the lands of public entities in the State of Texas:

> It is the public policy and in the public interest of the State of Texas to locate, protect, and preserve all sites, objects, buildings, pre-twentieth century shipwrecks, and locations of historical, archeological, educational, or scientific interest, including but not limited to prehistoric and historical American Indian or aboriginal campsites, dwellings, and habitation sites, archeological sites of every character, treasure imbedded in the earth . . . in, on, or under any of the land in the State of Texas. (Antiquities Code of Texas, Subchapter A, Section 191.002)

All of the archeological sites on public land in the State of Texas are state archeological landmarks, and are eligible for official designation:

> Sites, objects, buildings, artifacts, implements, and locations of historical, archeological, scientific, or educational interest, including those pertaining to prehistoric and historical American Indians or aboriginal campsites, dwellings, and habitation sites, their artifacts and implements of culture, as well as archeological sites of every character that are located in, on, or under the surface of any land belonging to the State of Texas or to any county, city, or political subdivision of the state are state archeological landmarks and are eligible for designation. (Antiquities Code of Texas, Subchapter D, Section 191.092(a))

Texas Historical Commission rules retitle State Archeological Landmarks as State Antiquities Landmarks because they include archeological sites, archeological collections, buildings, structures, ruins, cultural landscapes, engineering features, monuments and other objects, and districts that are eligible to be designated as landmarks or are already officially designated as landmarks (Texas Administrative Code, Title 13, Chapter 26, Subchapter A, Section 26.3(64)).

The Texas Historical Commission has the authority to designate archeological sites as official State Antiquities Landmarks when they meet one or more of the five archeological criteria for official designation (Texas Administrative Code, Title 13, Chapter 26, Subchapter C, Section 26.10). The five archeological criteria are:

> (1) the site has the potential to contribute to a better understanding of the prehistory and/or history of Texas by the addition of new and important information;
>
> (2) the site's archeological deposits and the artifacts within the site are preserved and intact, thereby supporting the research potential or preservation interests of the site;
>
> (3) the site possesses unique or rare attributes concerning Texas prehistory and/or history;
>
> (4) the study of the site offers the opportunity to test theories and methods of preservation, thereby contributing to new scientific knowledge; and
>
> (5) there is a high likelihood that vandalism and relic collecting has occurred or could occur, and official landmark designation is needed to insure maximum legal protection, or alternatively, further investigations are needed to mitigate the effects of vandalism and relic collecting when the site cannot be protected.

Protection of archeological sites on state lands is enhanced by the fact that information on the location and content of all of these sites is exempt from the Open Records Act (Texas Government Code, Title 5, Subtitle A, Chapter 552):

> Information specifying the location of any site or item declared to be a state archeological landmark under Subchapter D of this chapter is not public information. (Antiquities Code of Texas, Subchapter A, Section 191.004(a))

The Texas Historical Commission designates State Antiquities Landmarks, maintains vigilance over them, and issues permits to qualified archeologists for their investigation:

> Landmarks under Section 191.091 or Section 191.092 of this code are the sole property of the State of Texas and may not be removed, altered, damaged, destroyed, salvaged, or excavated without a contract with or permit from the committee [Texas Historical Commission]. (Antiquities Code of Texas, Subchapter D, Section 191.093)

Violations of the terms of the Antiquities Code of Texas such as collecting artifacts and digging in archeological sites without a permit, are criminal acts punishable by a fine and/or jail term:

> A person violating any of the provisions of this chapter is guilty of a misdemeanor, and on conviction shall be punished by a fine of not less than $50 and not more than $1,000, by confinement in jail for not more than 30 days, or by both. Each day of continued violation of any provision of this chapter constitutes a separate offense for which the offender may be punished. (Antiquities Code of Texas, Subchapter F, Section 191.171)

TPWD State Park Operational Rules (Texas Administrative Code, Title 31, Part 2, Chapter 59, Subchapter F) also declare vandalism of archeological sites to be an offense:

> It is an offense for any person to take, remove, destroy, deface, tamper with, disturb, or otherwise adversely impact any prehistoric or historic resource, including but not limited to, buildings, structures, cultural features, rock art, or artifacts, except by written order of the director. (Rules of Conduct in Parks, Section 59.134(l)(3))

Thus, state laws and rules assign the responsibility for identifying and protecting archeological sites on agency lands to the TPWD, under the vigilance of the Texas Historical Commission. Tools provided to accomplish this task are the protective powers of official State Antiquities Landmark designation, confidentiality of archeological site information, and criminal penalties for vandalism. TPWD personnel can use these tools to protect the archeological sites of Bastrop State Park.

The archeological sites recorded during this project are also evaluated in terms of their merit for inclusion in the National Register of Historic Places, a list of federally-recognized properties authorized by the National Historic Preservation Act of 1966 (54 U.S.C. 300101 et seq.). Even though the sites are located on state lands, compliance with federal antiquities codes could be required for future projects that utilize federal funds. The National Register includes nominated districts, sites, buildings, structures, and objects that have significance in American history,

architecture, archeology, engineering, and culture, and that possess integrity of location, design, setting, materials, workmanship, feeling, and association. In addition, at least one of these four criteria must be met by properties that are judged to merit inclusion in the National Register:

> (a) Association with events that have made a significant contribution to the broad patterns of our history;
>
> (b) association with the lives of persons significant in our past;
>
> (c) embodiment of the distinctive characteristics of a type, period, or method of construction, representation of the work of a master, possession of high artistic values, or representation of a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) history of yielding or likelihood of yielding information important in prehistory or history. (Code of Federal Regulations, Title 36, Chapter I, Part 60, Section 60.4)

SIGNIFICANCE OF 12 ARCHEOLOGICAL SITES ON BASTROP STATE PARK

In total, 41 archeological sites have been recorded on Bastrop State Park through 2011. Twenty-nine of them were found during previous investigations (see Prehistoric Background section). Twelve were recorded during the current investigations, and their significance is evaluated in this section.

Although all the archeological sites on Bastrop State Park are state antiquities landmarks due to their location on state lands, a smaller number merit official designation as State Antiquities Landmarks. Designation is reserved for those sites that have a research potential that is moderate to high, exhibit unique attributes, are susceptible to vandalism, or otherwise deserve special protection. The official State Antiquities Landmark designation is an honorary title as well as a management tool; it distinguishes significant sites, and alerts TPWD personnel that they need protection. It also strengthens the ability to prosecute vandalism of those sites. Although the sites that are not recommended for official designation as State Antiquities Landmarks do not completely lack research potential, further investigations usually will not be required if they will be impacted by construction or visitor activities.

The 12 archeological sites differ in terms of their research potential and the degree to which they have been impacted by natural processes and human activities. The susceptibility of each site to damage depends on its fragility, as well as the level of visitation and the natural processes that occur in that area. The types of data that each site is likely to contain, the degree of preservation or integrity of those data, and the research topics that the site promises to address have been used to evaluate the research potential of each site. Based on their research potential and susceptibility to vandalism, recommendations have been made on the merit of each site for official designation

as a State Antiquities Landmark. Ten sites (83 percent) merit official State Antiquities Landmark designation and two sites (17 percent) do not merit official Landmark designation (Table 7-1). In addition, the sites were evaluated for eligibility for listing on the National Register of Historic Places based on their history of likelihood of yielding information important in prehistory or history. The same 10 sites (83 percent) are recommended as eligible for listing on the National Register of Historic Places while two sites (17 percent) are recommended as ineligible for listing on the National Register of Historic Places.

Management priority rankings for archeological sites on TPWD properties adhere to a four-part classification. Management Priority 1 is assigned to officially designated State Antiquities Landmarks that retain a high degree of integrity and research potential. Management Priority 2 is assigned to sites that merit official designation as State Antiquities Landmarks due to their research potential. Preservation efforts should be concentrated on sites ranked as Management Priority 1 and 2. Management Priority 3 is assigned to officially designated State Antiquities Landmarks that have low research potential; additional preservation efforts should be directed to these sites when possible. Management Priority 4 is assigned to sites that do not merit official designation as State Antiquities Landmarks. Although these sites have a low priority for management and protection, damage to them should be avoided whenever possible.

No sites met the criteria for Management Priority 1. Management Priority 2 has been assigned to ten sites (83 percent), while no sites met the criteria for Management Priority 3. Management Priority 4 has been assigned to two sites (17 percent) (Figure 7-1, see Table 7-1).

The next two sections describe methods to address ongoing impacts that can damage significant archeological sites in Bastrop State Park, and outline procedures to obtain approval for construction and maintenance projects in the park.

Table 7-1. Site Significance and Management Priority.

Site	Research Potential	Age	State Antiquities Landmark Status	National Register of Historic Places Eligibility	Causes of Damage	Percent Intact	Management Priority	Susceptible to Vandalism	Management Practices
41BP871	Moderate	Late Prehistoric	Recommended for designation	Recommended eligible	logging, extensive rodent burrowing, wildfire	60%	2	No	monitor yearly for erosion and bioturbation
41BP872	Moderately high	Prehistoric, early 20th century	Recommended for designation	Recommended eligible	clearing, plowing, rodent burrowing, wildfire	40-80%	2	No	monitor yearly for erosion and bioturbation, limit access on road
41BP873	Moderately high	Prehistoric, early 20th century	Recommended for designation	Recommended eligible	clearing, rodent burrowing, sheet erosion, wildfire	60%	2	No	monitor yearly for erosion and bioturbation, limit access on road
41BP874	Low	Prehistoric	Not recommended for designation	Recommended ineligible	Sheet erosion	80%	4	No	none recommended
41BP875	Moderately high	Prehistoric	Recommended for designation	Recommended eligible	animal burrowing, wildfire	60%	2	No	monitor yearly for erosion and bioturbation
41BP876	Low	Archaic	Not recommended for designation	Recommended ineligible	minor erosion	70%	4	No	none recommended
41BP877	Moderately high	Late Archaic	Recommended for designation	Recommended eligible	rodent burrowing, erosion, wildfire	50%	2	No	monitor 4 times per year for erosion and vandalism
41BP878	Moderate	Prehistoric	Recommended for designation	Recommended eligible	road construction, wildfire	60%	2	No	monitor yearly for erosion and bioturbation
41BP879	Moderately high	Late Paleoindian, Late Archaic, Late Prehistoric	Recommended for designation	Recommended eligible	Uncontrolled excavations, road construction, modern dumping, wildfire	50%	2	Yes	monitor 4 times per year for erosion and vandalism
41BP880	Moderately high	Late Prehistoric	Recommended for designation	Recommended eligible	wildfire, erosion	70%	2	Yes	monitor 4 times per year for erosion, particularly gullying
41BP881	Moderately high	Late Prehistoric	Recommended for designation	Recommended eligible	wildfire, road construction, animal burrowing, erosion	60%	2	Yes	monitor yearly for erosion
41BP882	High	Late Paleoindian, Early Archaic, Middle Archaic, Late Archaic, Late Prehistoric	Recommended for designation	Recommended eligible	clearing, animal burrows, erosion, unimproved roads, minor scorching, collecting	60-70%	2	No	monitor 4 times per year for erosion and vandalism

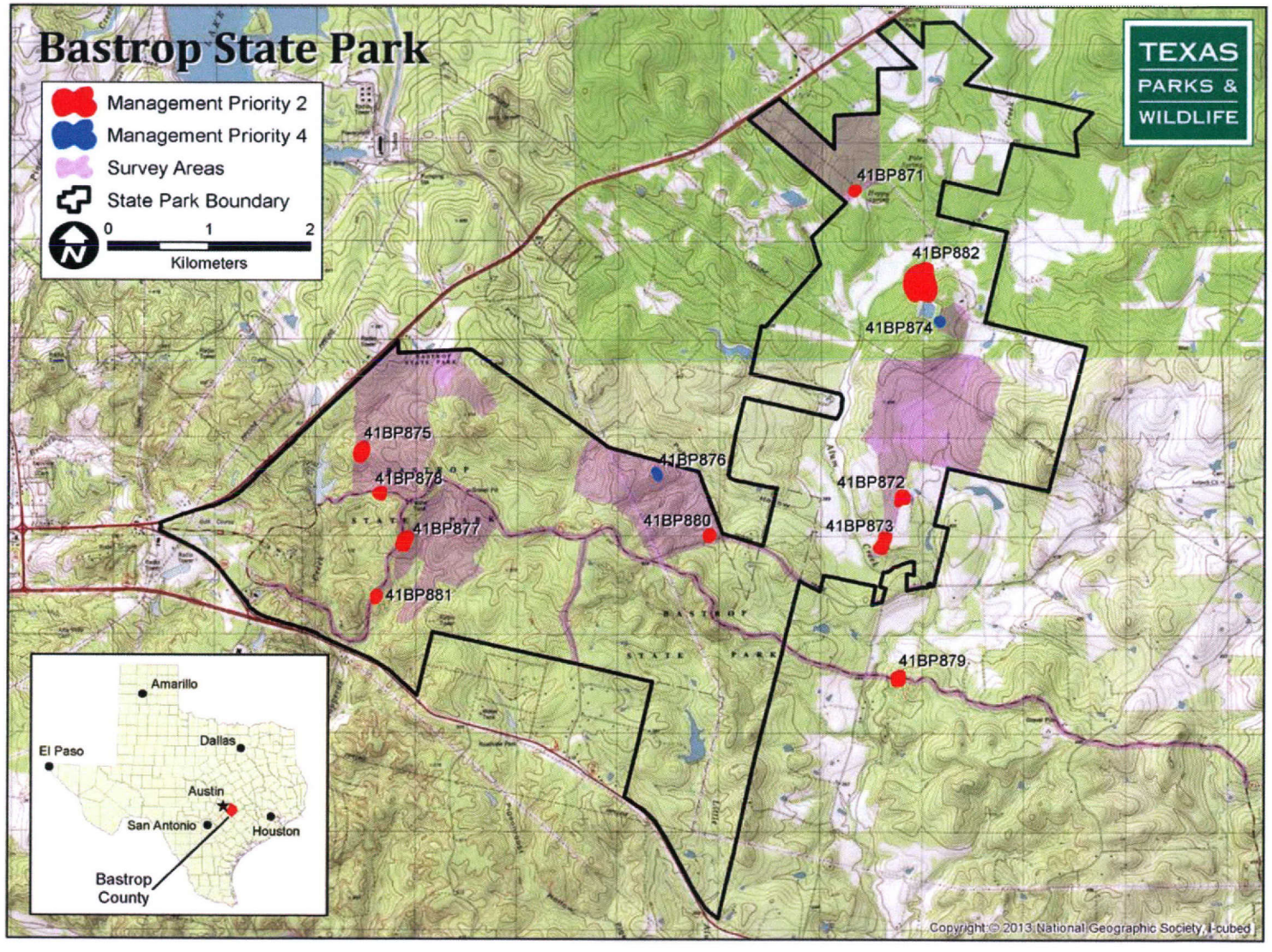

Figure 7-1. Archeological sites and management priority.

IMPACTS TO ARCHEOLOGICAL SITES

Archeological sites can be damaged by ongoing human activities and natural processes, as well as construction and maintenance activities. Impacts that have damaged the significant archeological sites at Bastrop State Park and/or may do so in the future are erosion, pedestrian traffic, unauthorized artifact collection, wildfires, and construction. Recommendations are provided for minimizing or eliminating these impacts.

Erosion

The sandy sediments at Bastrop State Park are susceptible to loss through erosion. Sediments that are not anchored by vegetation or a protective crust are particularly likely to wash or blow away. Erosion damages archeological sites because it causes artifacts to be displaced, destroying their original context and lessening their research value. Water erosion concentrates artifacts at the base of steep slopes and gullies, where they may be further displaced by high water flow. Wind erosion removes sediments that surround buried archeological components, combining artifacts from multiple time periods in a single layer on the ground surface. Erosion also makes artifacts visible to park visitors, and susceptible to unauthorized collection.

The Bastrop County Complex Fire in September 2011, coupled with heavy rainfall in January 2012, led to severe erosion throughout the park. With essentially no ground cover following the fire, there was nothing to hold the sandy soils in place.

All of the archeological sites in the park have experienced some degree of erosion, though periods of high rainfall in recent years have caused grasses and woody shrubs to spread into areas that previously had been eroded. Efforts should be focused on forestalling severe erosion at two sites: 41BP879 and 41BP882.

Pedestrian Traffic

Pedestrian traffic is a welcome activity in parks, but can damage archeological sites by trampling and killing the vegetation that anchors sediments, and/or breaking through the protective crust on undisturbed soils. Areas that have been impacted by high levels of pedestrian traffic are increasingly susceptible to erosion. Artifacts exposed in areas of high pedestrian traffic are vulnerable to unauthorized collection. The 12 sites recorded during this investigation are not crossed by hiking trails and are not susceptible to these damages. Site 41BP879 is bisected by a roadway and uncontrolled excavations were noted at this site.

Unauthorized Artifact Collection

Vandalism of archeological sites on state property consists of any artifact collection, metal detection, and/or excavation that is not conducted under a Texas Antiquities Permit. These

activities may occur when artifacts and features are visible in unguided areas that are rarely patrolled by park personnel. Decorated ceramics, projectile points, or other objects that appeal to collectors are particularly vulnerable to vandalism. Telltale signs of vandalism include piles of discarded artifacts near areas where artifacts were illegally collected from the surface. Unauthorized excavations are indicated by shallow, irregular pits, with piles of dirt and discarded artifacts nearby. Excavation is the most severe form of vandalism, because it can destroy the research value of significant buried archeological sites.

Vandalism of the archeological sites of Bastrop State Park has happened. Currently, visitors are strongly discouraged from picking up artifacts by means of an orientation video, and through the surveillance of guides and park rangers. With the exception of site 41BP879, little evidence of unauthorized excavations was noted during the current investigations.

Unauthorized collection and excavation of artifacts on state parks is prohibited by Texas State Park Rules (Section 59.34dd), which classify non-permitted disturbance of artifacts as a Class C misdemeanor punishable by a fine of up to $500. When a person is caught in the act of collecting artifacts from Bastrop State Park, park personnel currently confiscate the artifacts, record the location where they were found on an artifact card, and submit those materials to the designated TPWD Cultural Resources Coordinator. Persons committing purposeful acts of vandalism should be issued a citation by a licensed peace officer. Severe vandalism to significant archeological sites on state property may be prosecuted under the Antiquities Code of Texas by filing charges with the county attorney.

To forestall the possibility of vandalism in Bastrop State Park, park personnel should continue to ensure that every adult visitor receives the mandatory orientation annually, and that guides exercise vigilance over tour groups so that no archeological sites are disturbed. Routine patrols of unguided areas of the park will also give park visitors reason to believe that their actions are being monitored. If park staff note that significant archeological sites in unguided areas have been exposed by wind or water erosion, those areas should be protected by piling dead branches or grass over them so they are concealed from the public.

In addition, maps, records, and other forms of data that include locations of the archeological sites in Bastrop State Park should never be posted in public areas. Even among park staff, this information should be limited to persons who have a need to know, based on the judgment of the superintendent. General information on areas of the park where certain activities took place during the long record of human presence at Bastrop State Park may be shared with park visitors. Eleven sites are not in areas susceptible to foot traffic and unlikely to be looted. As noted above, the exception is site 41BP879 that is susceptible to vandalism due to its location along a roadway.

Wildfires and Prescribed Burns

Wildfires are not completely preventable. Ecosystem management requires the reintroduction of fire through either prescribed fires or to allow wildfires to burn unabated. When a wildfire occurs in areas where archeological resources are located, damage to sites can occur not only through suppression actions but from the unnatural fire intensities generated from accumulated fuel loading such as abundant undergrowth. According to the California Department of Forestry and Fire Protection: "Wildfires therefore, do not afford the opportunity for archaeologists to successfully protect known and newly discovered sites." Prescribed fire, through proper planning and site surveys can protect archeological resources and allow the reintroduction of fires as a natural process in fire dependent ecosystems (Smith 1999:1).

CONSTRUCTION AND MAINTENANCE REVIEW AND APPROVAL

Of all the activities conducted on TPWD property, construction projects that disturb the ground surface have the greatest potential to damage archeological sites. Rehabilitation of existing facilities may damage cultural deposits if work extends beyond or below the areas that were disturbed originally. Maintenance activities that disturb the ground surface can also damage cultural deposits. Under the Texas Antiquities Code, TPWD is fully accountable for all damage to archeological sites, even if it occurs accidentally or during routine activities.

Approval for actions that may damage archeological sites on lands owned and managed by TPWD is governed by a Memorandum of Understanding between TPWD and the Texas Historical Commission (Rules of Practice and Procedure for the Antiquities Code of Texas, Chapter 26, Subchapter E, Section 26.27). TPWD has established procedures for internal review of the impacts of proposed projects in State Parks Division Policy SP-Pro-4.A.1. A project is considered to be any undertaking on a state park or natural area if it has the potential to affect, enhance, impair, compromise, impact, or damage natural, cultural (prehistoric or historic) resources, cultural landscapes, viewsheds, and/or park design, intent, use, character, or aesthetic.

Initially, a consultation and flaw analysis consultation for each project on Bastrop State Park will be conducted by the Regional Director, the Project Initiator, and other personnel including the designated Cultural Resources Coordinator for the State Park. If the project is approved to move forward, the Project Initiator must complete a Project Review Request Form (PWD 0779). The form includes a complete, accurate, and detailed description of the project, including all borrow areas, access roads, turnarounds, and other associated areas that will be damaged. Additional information is attached to the Project Review Request Form, including a park facility map showing the general location of the project, the precise location of the project in a digital format or marked on a U.S.G.S. 7.5' quadrangle map, written detailed project plans, schematic plans if available, and digital photographs of the project area as needed.

TPWD personnel who review completed Project Review Request Forms include the designated Cultural Resources Coordinators for those properties. Contact information for those

persons can be obtained from the TPWD Cultural Resources Program office (512/389-4736). The Cultural Resources Coordinator needs 30 to 60 days of lead time to review a project. They will examine the project plans and description, look up archeological information on file for that area, and determine whether significant archeological sites are likely to be damaged by the project. The Cultural Resources Coordinator also will ascertain whether the project requires approval by the Texas Historical Commission and/or other agencies.

The Cultural Resources Coordinator may determine that archeological investigations need to be conducted to determine whether significant cultural resources are present in the project area. For small projects, the Cultural Resources Coordinator and/or staff from the TPWD office of Archeological Services will conduct and report on those investigations. For large projects and/or projects that could cause extensive damage to significant archeological sites, the Cultural Resources Coordinator will develop a scope for archeological investigations, and will help the Project Initiator to obtain those services from TPWD Archeological Services or a contractor. The Cultural Resources Coordinator will review and approve the report of findings.

When all of the conditions required by the Cultural Resources Coordinator, the Texas Historical Commission, and/or other agencies are met, the Cultural Resources Coordinator will issue a signed Archeological Review Response to the Project Initiator, Superintendent of the property, and Regional Director, indicating that the project is authorized to proceed in terms of its impacts on cultural resources. In some cases, projects will be approved with conditions. For example, the Cultural Resources Coordinator may require that personnel who have been trained and certified by TPWD as cultural resource monitors observe certain projects, and inform the Cultural Resources Coordinator if any artifacts or other archeological evidence is uncovered.

This management plan provides a framework for anticipating actions that will be needed to protect the cultural resources of Bastrop State Park, and allows for planning to minimize the impacts of park operations on those resources. Substantial cost and time savings can be realized by avoiding the archeological investigations that will be required when significant cultural resources are slated for destruction. TPWD and the Texas Historical Commission will refer to the management plan when they are deciding whether to require archeological investigations before a construction project is approved to go forward under the Antiquities Code of Texas.

ACCIDENTAL DISCOVERY OF CULTURAL RESOURCES

Even when TPWD has made diligent efforts to identify all of the archeological sites in a proposed project area, new or significant archeological sites may be discovered after fully authorized construction projects or maintenance activities are underway, or may be exposed by natural processes like erosion. Human remains that appear to be over 75 years old are among the most significant materials that may be discovered accidentally. If this should occur, all activities in that area must cease immediately. Follow the instructions in the TPWD Policy on the Treatment of Human Remains (LF-99-02) and the Procedures for Human Remains (insert number here in

final). Additional protective measures and/or further archeological investigations may be required by Texas Historical Commission and/or TPWD before the project is allowed to proceed.

MANAGEMENT RECOMMENDATIONS FOR ARCHEOLOGICAL SITES

Management recommendations are provided for protection of each archeological site recoded during this investigation but are focused on the 10 sites with high and moderately high research potential (see table 7-1). Recommended management practices primarily consist of conducting regular patrols of sites and monitoring them for evidence of vandalism and/or erosion. In addition, the reestablishment of native vegetation should be promoted at all of the archeological sites, so that the cultural deposits will be stabilized. If evidence of vandalism, erosion, or other damage is discovered, the park superintendent must immediately notify the designated TPWD Cultural Resources Coordinator for the park, and implement the protective measures that may be requested.

FUTURE ARCHEOLOGICAL INVESTIGATIONS

Although the cultural resources at Bastrop State Park have a high potential to advance knowledge of the prehistory and history of the region, preservation of them is the first priority. Future investigations should be based on park needs and focused on areas slated for construction and maintenance activities.

REFERENCES CITED

Adams, Jenny L.
2002 *Ground Stone Analysis: A Technological Approach*. University of Utah Press, Salt Lake City.

Ahr, Steven W., Lee C. Nordt, and Steven L. Forman
2013 Soil Genesis, Optical Dating, and Geoarchaeological Evaluation of Two Upland Alfisol Pedons within the Tertiary Gulf Coastal Plain. *Geoderma* 192:211-226.

Alvarado, Luis A.
2016 Letter to the Texas Historical Commission Regarding Proposed Lake-shore Embankment Stabilization at Civilian Conservation Corps Cabins 1 and 12, Bastrop State Park, Bastrop County, March 29, 2016. Cultural Resources Program files, Texas Parks & Wildlife Department, Austin.

Andrefsky, William Jr.
2005 *Lithics: Macroscopic Approaches to Analysis*. Cambridge Manuals in Archaeology. Cambridge University Press, New York.

Anthony, Dana, and David O. Brown
2000 Archaeological Survey for Proposed Utility Lines at Bastrop State Park, Bastrop County, Texas. In *Texas Parks and Wildlife Department 1998 Annual Report to the Texas Historical Commission*, compiled by Aina Dodge and Karen Harry, pp. 5-43. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Baker, Frank E.
1979 *Soil Survey of Bastrop County, Texas*. U.S. Department of Agriculture Soil Conservation Service, in cooperation with the Texas Agriculture Experiment Station.

Banks, Larry D.
1990 *From Mountain Peaks to Alligator Stomachs: A Review of Lithic Sources in the Trans-Mississippi South, the Southern Plains, and Adjacent Southwest*. Memoir 4. Oklahoma Anthropological Society, Norman.

Barnes, Robin Benson
2016 Hidden Pines Firebreaks Survey, Buescher and Bastrop State Parks, Bastrop County, Texas. In *Texas Parks and Wildlife Department Report of Archeological Investigations for 2015*, edited by Richard B. Mahoney, pp. 27-47. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Barnes, Virgil E.
1974 *Geologic Atlas of Texas, Austin Sheet*. Bureau of Economic Geology, The University of Texas at Austin.

Bastrop County Deed Records

Bement, Leland C., Wayne Bartholemew, Glenn T. Goode, Stephen A. Hall, and David G. Robinson
1989 *Excavations at 41BP19, the Kennedy Bluffs Site, Bastrop County, Texas.* Contract Reports in Archaeology 5. Highway Design Division, State Department of Highways and Public Transportation, Austin, Texas.

Bever, Timothy K., and David Meltzer
2007 Exploring Variation in Paleoindian Life Ways: The Third Revised Edition of the Texas Clovis Fluted Point Survey. *Bulletin of the Texas Archeological Society* 78:65-97.

Black, Art
1996 Golf Course Expansion at Bastrop State Park. In *Texas Parks and Wildlife Department Annual Report for 1995*, compiled by Cynthia Brandimarte and Aina Dodge, pp. 378-381. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

2000 Archaeological Survey for Proposed Utility Lines at Bastrop State Park, Bastrop County, Texas: Conclusion. In *Texas Parks and Wildlife Department 1998 Annual Report to the Texas Historical Commission*, compiled by Aina Dodge and Karen Harry, p. 29. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Black, Art, Ralph Newlan, Amy Blair, and Carole Medlar
2000 Bastrop State Park Resources Management Plan. Unpublished manuscript, Cultural Resources Program files, Texas Parks & Wildlife Department, Austin.

Black, Stephen L., and Darrell G. Creel
1997 The Central Texas Burned Rock Midden Reconsidered. In *Hot Rock Cooking on the Greater Edwards Plateau: Four Burned Rock Midden Sites in West Central Texas,* by Stephen L. Black, Linda W. Ellis, Darrell G. Creel, and Glenn T. Goode, pp. 269-305. Studies in Archeology 22. Texas Archeological Research Laboratory, The University of Texas at Austin. Archeological Studies Program Report 2. Texas Department of Transportation, Austin.

Blair, W. Frank
1950 The Biotic Provinces of Texas. *The Texas Journal of Science* 2(1):93-117.

Booth, Emily, and Eric L. Keith
2014 Vegetation Assessment Following Bastrop County Complex Fire Using Forty-Five Fire Monitoring Handbook (FMH) Vegetation Plots at Bastrop State Park in Bastrop County, Texas. Unpublished manuscript, Natural Resources Program files, Texas Parks & Wildlife Department, Austin.

Bousman, C. Britt
1998 Late Paleoindian Archeology. In *Wilson-Leonard: An 11,000-year Archeological Record of Hunter-Gatherers in Central Texas. Volume 1: Introduction, Background, and Syntheses,* by Michael B. Collins, Gail L. Bailey, C. Britt Bousman, Susan W. Dial, Paul Goldberg, Jan Guy, Vance T. Holliday, C.E. Mear, and Paul R. Takac, pp. 161-210. Studies in Archeology 31. Texas Archeological Research Laboratory, The University of Texas at Austin. Archeological Studies Program Report 10. Texas Department of Transportation, Austin.

Bousman, C. Britt, Barry W. Baker, and Anne C. Kerr
2004 Paleoindian Archeology in Texas. In *The Prehistory of Texas,* edited by Timothy K. Perttula, pp. 15-97. Texas A&M University Press, College Station.

Bousman, C. Britt, David L. Nickels, and Damon P. Stone
2010 Results of the Investigation and Project Summary. In *An Archaeological Survey of 3,475 Acres at Camp Swift, Bastrop County, Texas,* edited by David L. Nickels, C. Britt Bousman, and Jessica L. Hurley, pp. 361-377. Archaeological Studies Report 11. Center for Archaeological Studies, Texas-State University-San Marcos.

Bousman, C. Britt, and Eric Oksanen
2012 The Protoarchaic in Central Texas and Surrounding Areas. In *From the Pleistocene to the Holocene: Human Organization and Cultural Transformations in Prehistoric North America,* edited by C. Britt Bousman and Bradley J. Vierra, pp. 197-232. Texas A&M University Anthropology Series 17. Texas A&M University Press, College Station.

Brown, Donald J., Ivana Mali, and Michael R. J. Forstner
2014 Wildfire and Postfire Restoration Action Effects on Microclimate and Seedling Pine Tree Survivorship. *Journal of Fish and Wildlife Management* 5(1):174-182.

Brown, Kenneth M.
1986 *Archaeological Studies at the CPS Butler Lignite Prospect, Bastrop and Lee Counties, Texas*. Archaeological Survey Report 140. Center for Archaeological Research, The University of Texas at San Antonio.

Bruseth, James E., and William A. Martin
2001 OSL Dating Sandy Mantle Sites in East Texas. *Current Archeology in Texas* 3(1):12-17.

Bryant, Vaughn M., Jr.
1969 Late Full-Glacial and Post-Glacial Pollen Analysis of Texas Sediments. Unpublished Ph.D. dissertation, The University of Texas at Austin.

1977 A 16,000 Year Pollen Record of Vegetational Change in Central Texas. *Palynology* 1:143-156.

Bryant, Vaughn M., Jr., and Richard G. Holloway
1985 A Late Quaternary Paleoenvironmental Record of Texas: An Overview of the Pollen Evidence. In *Pollen Records of Late-Quaternary North American Sediments*, edited by Vaughn M. Bryant, Jr. and Richard G. Holloway, pp. 39-70. American Association of Stratigraphic Palynologists Foundation, Dallas, Texas.

Bureau of Economic Geology
1996 *Physiographic Map of Texas*. Bureau of Economic Geology, The University of Texas at Austin.

Byrd, Clifford Leon
1971 *Origin and History of the Uvalde Gravel of Central Texas*. Baylor Geological Studies Bulletin 20. Baylor University, Waco, Texas.

Callahan, Errett
1979 The Basics of Biface Knapping in the Eastern Fluted Point Tradition: A Manual for Flintknappers and Lithic Analysts. *Archaeology of Eastern North America* 7(1):1-180.

Campbell, T. N.
1988 Name All the Indians of the Bastrop Area. In *The Indians of Southern Texas and Northeastern Mexico: Selected Writings of Thomas Nolan Campbell*, pp. 71-77. Texas Archeological Research Laboratory, The University of Texas at Austin.

Carpenter, Stephen M., and Kevin Miller
2013 Synthesis – The Long Transition from Archaic to Late Prehistoric Times in Central Texas. Chapter 13 in *The Siren Site: The Long Transition from Archaic to Late Prehistoric Lifeways on the Eastern Edwards Plateau of Central Texas,* by Stephen M. Carpenter, Kevin A. Miller, Mary Jo Galindo, Brett A. Houk, Charles Frederick, Mercedes C. Cody, John Lowe, Ken Lawrence, Kevin Hanselka, and Abby Peyton, pp. 339-363. Cultural Resources Report 12-93. SWCA Environmental Consultants, Austin, Texas. Archeological Studies Program Report 142. Texas Department of Transportation, Austin.

Carpenter, Stephen M., Kevin A. Miller, Mary Jo Galindo, Brett A. Houk, Charles Frederick,Mercedes C. Cody, John Lowe, Ken Lawrence, Kevin Hanselka, and Abby Peyton
2013 *The Siren Site: The Long Transition from Archaic to Late Prehistoric Lifeways on the Eastern Edwards Plateau of Central Texas.* Cultural Resources Report 12-93. SWCA Environmental Consultants, Austin, Texas. Archeological Studies Program, Report 142. Texas Department of Transportation, Austin.

Carpenter, Steve
2006 Spatial Patterning and Site Structure. Chapter 9 in *The McKinney Roughs Site 41BP627: A Stratified Late Archaic II Site on the Colorado River Terraces, Bastrop County, Texas,* by Steve Carpenter, Michael Chavez, Kevin Miller, and Ken Lawrence, pp. 145-185. Cultural Resources Report 02-313. SWCA Environmental Consultants, Austin, Texas.

Carpenter, Steve, Michael Chavez, and Ken Lawrence
2006 Cultural Features, Artifacts, and Ecofacts. Chapter 8 in *The McKinney Roughs Site 41BP627: A Stratified Late Archaic II Site on the Colorado River Terraces, Bastrop County, Texas,* by Steve Carpenter, Michael Chavez, Kevin Miller, and Ken Lawrence, pp. 85-143. Cultural Resources Report 02-313. SWCA Environmental Consultants, Austin, Texas.

Carpenter, Steve, and Kevin Miller
2006 Summary and Conclusions. Chapter 11 in *The McKinney Roughs Site 41BP627: A Stratified Late Archaic II Site on the Colorado River Terraces, Bastrop County, Texas,* by Steve Carpenter, Michael Chavez, Kevin Miller, and Ken Lawrence, pp. 197-198. Cultural Resources Report 02-313. SWCA Environmental Consultants, Austin, Texas.

Carr, Bill
2013 A Botanical Survey of Bastrop State Park, Bastrop County Texas: Part One of Multi-Year Floristic Study of Texas State Parks. Unpublished manuscript, Natural Resource Program files, Texas Parks & Wildlife Department, Austin.

Collins, Michael B.
2004 Archeology in Central Texas. In *The Prehistory of Texas,* edited by Timothy K. Perttula, pp. 101-126. Texas A&M University Press, College Station.

2014 Evidence for Older-than-Clovis at the Gault Site, Texas. Poster presented at the 85th Annual Meeting of the Texas Archeological Society, San Marcos, Texas.

Creel, Darrell, Jeffery R. Ferguson, and Nancy A. Kenmotsu
2013 A Compositional Analysis of Central Texas Hunter-Gatherer Ceramics and Its Implications for Mobility, Ethnic Group Territory, and Interaction. *Bulletin of the Texas Archeological Society* 84:29-83.

Dillehay, Tom D.
1974 Late Quaternary Bison Population Changes on the Southern Plains. *Plains Anthropologist* 19(65):180-196.

Dixon, Boyd, and Robert Rogers
2006 *Prehistoric Encampments at the Shepherd Site: Testing and Data Recovery at 41WM1010, Williamson County, Texas.* PBS&J Document 040018. PBS&J, Austin, Texas.

Drake Well Museum
1996 The History of Vaseline Petroleum Jelly began in the Pennsylvania Oil Fields! Drake Well Museum pamphlet, copyright 1996 by Holigan Group Ltd., Dallas, Texas.

Duke, Paul L.
1977 Lake Thunderbird Site (41BP78), Bastrop, Texas. *La Tierra,* Journal of the Southern Texas Archaeological Association 4(3):15-26.

Edwards, Jay D., and Tom Wells
1993 *Historic Louisiana Nails: Aids to the Dating of Old Buildings*. Fred B. Kniffen Cultural Resources Laboratory Monograph Series 2. Department of Geography and Anthropology, Louisiana State University, Baton Rouge.

Ensor, H. Blaine and Catherine S. Mueller-Wille
1988 *Excavations at the Bull Pen Site 41BP280, Colorado River Drainage, Bastrop County, Texas*. Contract Reports in Archaeology 3. Highway Design Division, State Department of Highways and Public Transportation, Austin, Texas.

Fields, Ross C.
2004 The Archeology of the Post Oak Savanna of East-Central Texas. In *The Prehistory of Texas,* edited by Timothy K. Perttula, pp. 347-369. Texas A&M University Press, College Station.

Frederick, Charles D., and Mark D. Bateman
2001 OSL Dating and Sandy-Mantle Sites in East Texas: A Reply. *Current Archeology in Texas* 3(2):14-18.

Frederick, Charles, and Brittney Gregory
2016 A Geoarcheological Examination of Feature 30, Area 2, at Site 41BP595 in *National Register Testing at Sites 41BP585, 41BP594, and 41BP595, Three Oaks Mine, Bastrop County, Texas* edited by David L. Sherman, pp. 91-111. Blanton and Associates, Inc., Austin.

Galan, Victor
2012 Chapter VII: Geomorphological Investigations in *Intensive Archeological Survey at Bastrop and Buescher State Parks* (draft) by Josh Haeffner, Victor Galan, Samantha Champion, Senna Barnett, Hannah Vaughan, and Gregg Cestaro. Archeology Series 239. Hicks & Company, Austin, Texas.

Galindo, Mary Jo, Kevin A. Miller, and Stephen M. Carpenter
2013 Metric Discrimination of Projectile Points from 41WM1126. Chapter 12 in *The Siren Site: The Long Transition from Archaic to Late Prehistoric Lifeways on the Eastern Edwards Plateau of Central Texas,* by Stephen M. Carpenter, Kevin A. Miller, Mary Jo Galindo, Brett A. Houk, Charles Frederick, Mercedes C. Cody, John Lowe, Ken Lawrence, Kevin Hanselka, and Abby Peyton, pp. 323-338. Cultural Resources Report 12-93. SWCA Environmental Consultants, Austin, Texas. Archeological Studies Program Report 142. Texas Department of Transportation, Austin.

Gilmer, Anastasia, and Charles Frederick
2014 Geologic Context of the Older-than-Clovis Archaeological Material in Area 15 at the Gault Site. Poster presented at the 85th Annual Meeting of the Texas Archeological Society, San Marcos, Texas.

Goode, Glenn T.
1986 *Archaeological Testing at Site 41BP280, Bastrop County, Texas.* Unpublished manuscript, Highway Design Division files, State Department of Highways and Public Transportation, Austin, Texas.

1989 Appendix I: Private Collections from the Kennedy Bluffs Site. In *Excavations at 41BP19 The Kennedy Bluffs Site, Bastrop County, Texas* by Leland C. Bement, Wayne Bartholemew, Glenn T. Goode, Stephen A. Hall, and David G. Robinson, pp. 67-154. Contract Reports in Archaeology 5. Highway Design Division, State Department of Highways and Public Transportation, Austin, Texas.

Graham, A., and C. Heimsch
1960 Pollen Studies of some Texas Peat Deposits. *Ecology* 41:785-790.

Griffith, Glenn, Sandy Bryce, James Omernik, and Anne Rogers
2007 *Ecoregions of Texas.* Texas Commission on Environmental Quality, Austin.

Haeffner, Josh, Victor Galan, Samantha Champion, Senna Barnett, Hannah Vaughan, and Gregg Cestaro
2012 *Intensive Archeological Survey at Bastrop and Buescher State Parks* (draft). Archeology Series 239. Hicks & Company, Austin, Texas.

Henderson, Jerry
2001 *Excavations at the Rainey Site (41BN33), A Late Prehistoric Sinkhole Site in Bandera County, Texas.* Archaeology Studies Program Report 5. Texas Department of Transportation, Austin.

Highley, Cheryl L., Rochelle J. Leneave, Meredith L. Dreiss, and Stephen L. Black
1995 Artifact Analysis. In *Archaeological Investigations at the Loma Sandia Site (41LK28): A Prehistoric Cemetery and Campsite in Live Oak County, Texas,* by Anna Jean Taylor and Cheryl Lynn Highley, pp. 405-549. Studies in Archeology 20. Texas Archeological Research Laboratory, The University of Texas at Austin.

Himes, Sarah
2013 *Bastrop State Park Use-Wear Analysis: Bifacial Preforms.* Unpublished manuscript, Cultural Resources Program files, Texas Parks & Wildlife Department, Austin.

Holliday, Vance T.
1989 Middle Holocene Drought on the Southern High Plains. *Quaternary Research* 31:74-82.

Holloway, Richard G., and Vaughn M. Bryant Jr.
1984 *Picea glauca* Pollen from Late Glacial Deposits in Central Texas. *Palynology* 8:21-32.

Horn, Jonathon C.
2005 Historic Artifact Handbook. Alpine Archaeological Consultants, Inc. Montrose, Colorado. Online document available at http://alpinearchaeology.com/cms/wp-content/uploads/2010/01/Historic-Artifact-Handbook.pdf accessed March 28, 2012.

Howard, Margaret
2012 Letter to the Texas Historical Commission Regarding Interim Report on Timber Harvest Surveys, Bastrop State Park, Bastrop County, March 1, 2012. Cultural Resources Program files, Texas Parks & Wildlife Department, Austin.

Howard Hines, Margaret
1995 Shovel Testing at Site 41BP69, Bastrop State Park Bastrop County, Texas. In *Texas Parks and Wildlife Department Annual Report for 1995*, compiled by Cynthia Brandimarte and Aina Dodge, pp. 382-385. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Huebner, Jeffrey A.
1991 Late Prehistoric Bison Population in Central and Southern Texas. *Plains Anthropologist* 369(137):343-358.

Jelks, Edward B. Jelks
1962 *The Kyle Site: A Stratified Central Texas Aspect Site in Hill County, Texas.* Archaeology Series 1. Department of Anthropology, The University of Texas at Austin.

Johnson, LeRoy
1994 *The Life and Times of Toyah-Culture Folk As Seen from the Buckhollow Encampment, Site 41KM16, of Kimble County, Texas.* Office of the State Archeologist Report 38. Texas Department of Transportation and Texas Historical Commission, Austin.

Johnson, LeRoy, and Glenn Goode
1994 New Try at Dating and Characterizing Holocene Climates, as well as Archeological Periods, on the Eastern Edwards Plateau. *Bulletin of the Texas Archeological Society* 65:1-51.

JonWilliamson.com
2013 Vaseline Cream Hair Tonic 1948. In *JonWilliamson.com*. Electronic document, http://www.jonwilliamson.com/template_permalink.asp?id=2035, accessed July 12, 2013.

Kalter, Ardi J., Robert M. Rogers, and Michael N. Smith
2005 *Analysis and Reporting for 41FY135, The Sandbur Site, Fayette County, Texas.* Texas Department of Transportation Archeological Studies Program Report 73. PBS&J, Austin, Texas.

Karbula, James W., Rachel Feit, and Timothy B. Griffith
2001 *Changing Perspectives on the Toyah: Data Recovery Investigations of 41TV441, the Toyah Bluff Site, Travis County, Texas*. Archeology Series Report 94. Hicks & Company, Austin, Texas.

Kegley, George
1994 Electrical Renovation of Visitor Cabins in Bastrop State Park, Project 533-018. In *Texas Parks and Wildlife Department 1993 Annual Report*, compiled by Cynthia Brandimarte, pp. 285-287. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Keith, Eric L., and Greg Creacy
2011 Bastrop State Park Post-Fire Vegetation Assessment Following the 2011 Bastrop County Complex Wildfire. Unpublished manuscript, Natural Resource Program files, Texas Parks & Wildlife Department, Austin.

Kelly, Thomas C., and Erwin Roemer, Jr.
1981 *Archaeological and Historical Investigations in Bastrop and Lee Counties, Texas.* Archaeological Survey Report 101. Center for Archaeological Research, the University of Texas at San Antonio, San Antonio, Texas.

Krieger, Alex D.
1964 Early Man in the New World. In *Prehistoric Man in the New World*, edited by Jesse D. Jennings and Edward Norbeck, pp. 23-81. University of Chicago Press, Chicago.

Kuhn, Steven L.
1990 A Geometric Index of Reduction for Unifacial Stone Tools. *Journal of Archaeological Science* 17:583-593.

Larson, Donald A., Vaughn M. Bryant, Jr., and Tom S. Patty
1972 Pollen Analysis of a Central Texas Bog. *The American Midland Naturalist* 88:358-367.

Lindsey, Bill
2013 *Historic Glass Bottle Identification & Information Website.* Electronic document, http://www.sha.org/bottle/index.htm, accessed July 12, 2013.

Lohse, Jon C. and C. Britt Bousman
2006 *National Register Evaluation of Eight Sites at Camp Swift Army National Guard Training Center, Bastrop County, Texas: Swift V.* Center for Archaeological Studies, Texas-State University-San Marcos.

Lost Pines Recovery Team
2011 Bastrop County Complex Fire, Lost Pines Region, Resources Assessment and Response Report. Unpublished manuscript, Natural Resource Program files, Texas Parks & Wildlife Department, Austin.

Mahoney, Richard B.
2007a Wildlife Viewing Blind Installation. In *Texas Parks and Wildlife Department 2006 Annual Report to the Texas Historical Commission*, edited by Luis Alvarado, pp. 17-36. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

2007b Waterline Installation. *In Texas Parks and Wildlife Department 2006 Annual Report to the Texas Historical Commission,* edited by Luis Alvarado, pp. 1-16. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

2008a Francis Tract Burn Lanes, 2.5 Miles. In *Texas Parks and Wildlife Department 2007 Annual Report to the Texas Historical Commission*, pp. 30-42. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

2008b New State Parks Regional Office. In *Texas Parks and Wildlife Department 2007 Annual Report to the Texas Historical Commission*, pp. 43-55. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

2009 82-acre Pine Reforestation. In *Texas Parks and Wildlife Cultural Resources Program 2008 Annual Report*, edited by Richard B. Mahoney, pp. 1-8. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

2011 Erosion Abatement. In *Texas Parks and Wildlife Department Cultural Resource Program 2010 Annual Report*, edited by Tony Lyle, pp. 148-156. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Majewski, Teresita, and Michael J. O'Brien
1987 The Use and Misuse of Nineteenth-Century English and American Ceramics in Archaeological Analysis. In *Advances in Archaeological Method and Theory*, edited by Michael B. Schiffer, Volume 11, pp. 97-209. Academic Press, New York.

Mauldin, Raymond, Jennifer Thompson, and Leonard Kemp
2012 Reconsidering the Role of Bison in the Terminal Late Prehistoric (Toyah) Period in Texas. In *The Toyah Phase of Central Texas: Late Prehistoric Economic and Social Processes,* edited by Nancy A. Kenmotsu and Douglas K. Boyd, pp. 90-110. Texas A&M University Press, College Station.

McMahan, Craig A., Roy G. Frye, and Kirby L. Brown
1984 *The Vegetation Types of Texas, Including Cropland.* Wildlife Division, Texas Parks & Wildlife Department, Austin.

McNatt, Logan D.
2012 Archeological Survey of Ten Firebreaks at Bastrop State Park, Bastrop County, Texas. In *Texas Parks and Wildlife Department Report of Archeological Investigations for 2011,* edited by Richard B. Mahoney, pp. 1-9. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

McNatt, Logan, Carlos Beceiro, Martha Doty Freeman, Steve A. Tomka, Paul Schuchert, and Christine G. Ward
2000 *Archeological Survey and History of Government Canyon State Natural Area, Bexar County, Texas*. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Medlar, Carole
1995 *Archeological Survey and Testing in Bastrop State Park, Bastrop County, Texas*. Cultural Resources Program Report 95-3. Texas Parks & Wildlife Department, Austin.

Miller, George L.
1980 Classification and Economic Scaling of 19th Century Ceramics. *Historical Archeology* 14(1):1-40.

1991 A Revised Set of CC Index Values for Classification and Economic Scaling of English Ceramics from 1787 to 1880. *Historical Archeology* 25(1):1-25.

Miller, George L., Patricia Samford, Ellen Shlasko, and Andrew Madsen
2000 Telling Time for Archaeologists. *Northeast Historical Archaeology* 29:1-22.

Model T Ford Club of America
2016 Encyclopedia. Electronic document, http://www.mtfca.com/encyclo/I-O.htm#lamps, accessed March 21, 2016.

Moir, Randall W.
1987 Socioeconomic and Chronometric Patterning of Window Glass. In *Historic Buildings, Material Culture, and People of the Prairie Margin: Architecture, Artifacts, and Synthesis of Historic Archaeology*, edited by David H. Jurney and Randall W. Moir, pp. 73-81. Richland Creek Technical Series Volume V. Archaeology Research Program, Institute for the Study of Earth and Man, Southern Methodist University, Dallas, Texas.

1988 Refined Earthenwares and Ceramic Traditions. In *Historic Farming on the Hogwallow Prairies: Ethnoarcheological Investigations of the Mountain Creek Area, North Central Texas*, by David H. Jurney, Susan A. Lebo, and Melissa M. Greene (compilers), pp. 251-262. Joe Pool Lake Archeological Project Volume II. Archeology Research Program, Institute for the Study of Earth and Man, Southern Methodist University, Dallas, Texas.

Munoz, Cynthia
2006 *Archaeological Testing at 41BP679, Bastrop County, Texas*. Archaeological Report 366. Center for Archaeological Research, The University of Texas at San Antonio.

Munsell Color Company
2000 *Munsell Soil Color Charts*, revised washable edition. Munsell Color, New Windsor, New York.

Munsey, Cecil
1970 *The Illustrated Guide to Collecting Bottles*. Hawthorn Books Inc., New York.

Nash, Michael A., Allison L. Bates, and Carol Gavin
1996 *A Cultural Resources Survey of the Sim Gideon – Smithville 138-KV Transmission Line Rebuild Project, Bastrop County, Texas*. Document 960434. Espey Huston and Associates, Inc., Austin, Texas.

Nelson, Lee H.
1968 *Nail Chronology as an Aid to Dating Old Buildings*. Technical Leaflet 48. American Association for State and Local History, Nashville, Tennessee.

Newlan, Ralph Edward
1993 Bastrop State Park, Bastrop, Texas: Cultural Resources Survey Report. Unpublished manuscript, Cultural Resources Program files, Texas Parks & Wildlife Department, Austin.

Newlan, Ralph Edward, James W. Steely, Susan Begley, and Ethan Carr
1997 *National Historic Landmark Nomination, Bastrop State Park*. United States Department of Interior, National Park Service, Washington, D. C.

Newman, T. Stell
1970 A Dating Key for Post-Eighteenth Century Bottles. *Historical Archaeology* 4:70-75.

Nickels, David L., C. Britt Bousman, and Jessica L. Hurley
2010 *An Archaeological Survey of 3,475 Acres at Camp Swift, Bastrop County, Texas*. Archaeological Studies Report 11. Center for Archaeological Studies, Texas State University, San Marcos.

Nickels, David L., and D. Emory Worrell
2010 Prehistoric Component Sites Previously Documented by CAS. In *An Archaeological Survey of 3,475 Acres at Camp Swift, Bastrop County, Texas,* by David L. Nickels, C. Britt Bousman, and Jessica L. Hurley, pp. 37-62. Archaeological Studies Report 11. Center for Archaeological Studies, Texas State University, San Marcos.

Nightengale, Bruce A., S. Christopher Caran, Dan K. Utley, and H.G. Woolridge
1992 *Cultural Resource and Geomorphological Investigations at the Powell Bend II Lignite Prospect, Bastrop County, Texas*. Cultural Resources Report 1. Lower Colorado River Authority, Environmental Services Department, Austin, Texas.

Oksanen, Eric R., Mercedes C. Cody, and Kevin A. Miller
2008 Occupation Zone 2. In *The Gatlin Site (41KR621): Investigating Archaic Lifeways on the Southern Edwards Plateau of Central Texas,* by Brett A. Houk, Kevin A. Miller, and Eric R. Oksanen, pp. 9-1 to 9-44. Cultural Resources Report 149. SWCA Environmental Consultants, Austin, Texas. Archeological Studies Program Report 108. Texas Department of Transportation, Austin.

Patrick, Ruth
1946 Diatoms from the Patschke Bog, Texas. *Notulae Naturae of the Academy of Natural Sciences of Philadelphia* 170:1-7.

Perttula, Timothy K. and Linda Ellis
2013 Aboriginal Ceramics among Groups Living in the Prairie Savanna Region of Texas. *Bulletin of the Texas Archeological Society* 84:113-135.

Potzger, John E., and Benjamin C. Tharp
1943 Pollen Record of Canadian Spruce and Fir from a Texas Bog. *Science* 98:584.

1947 Pollen Profile from a Texas Bog. *Ecology* 28(3):274-280.

1954 Pollen Study of Two Bogs in Texas. *Ecology* 35(4):462-466.

Prewitt, Elton R.
1981a Cultural Chronology in Central Texas. *Bulletin of the Texas Archeological Society* 52:65-89.

1981b *Archeological Investigations at the Loeve-Fox, Loeve and Tombstone Bluff Sites in the Granger Lake District of Central Texas.* Archaeological Investigations at the San Gabriel Reservoir Districts Report 4. Institute of Applied Sciences, North Texas State University, Denton, Texas.

1985 From Circleville to Toyah: Comments on Central Texas Chronology. *Bulletin of the Texas Archeological Society 54:201-238.*

Ralph, Ronald W.
1985 Memorandum to Ed Werland Regarding Survey of Proposed 9-Hole Golf Course, June 14, 1985. Cultural Resources Program files, Texas Parks & Wildlife Department, Austin.

1987 Archeological Monitoring of Utilities. Memorandum to file, October 21, 1987. Cultural Resources Program files, Texas Parks and Wildlife Department, Austin.

1996 Assess Trail Placement, Assess Capital Improvement Projects. In *An Inventory of Cultural Resources within the Texas Park System: November 1976 through October 1981,* by Ronald W. Ralph, pp. 44-45. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

1997 Assess Trail Placement, Assess Capital Improvement Projects. In *An Inventory of Cultural Resources within the Texas Park System: November 1981 through October 1986,* by Ronald W. Ralph, pp. 34-35. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Rappole, John H., and Gene W. Blacklock
1994 *Birds of Texas: A Field Guide.* Texas A&M University Press, College Station.

Robinson, David G.
1987 *Bastrop County Historical Commission Sesquicentennial Project: Cultural Resource Investigations Along the Colorado River, Bastrop County, Texas*. Archeology Series 2, Texas Archeological Survey, The University of Texas at Austin.

2001 Results – Multi-Component. Chapter 5c in *An Archaeological Inventory of Camp Swift, Bastrop County, Texas,* by David G. Robinson, Timothy M. Meade, Leann Haslouer Kay, Linn Gassaway, and Dustin Kay, pp. 118-143. Archaeological Survey Report 316. Center for Archaeological Research, The University of Texas at San Antonio.

Smith, Jim
1999 CAL FIRE Archaeology Program: Protecting Archaeological Sites with Prescribed Fire. In *The Effects of Fire and Heat on Obsidian,* Janine M. Loyd, Thomas M. Origer, and David A. Fredrickson volume editors, U.S. Department of Interior, Bureau of Land Management, Sacramento. Accessed at: http://calfire.ca.gov/resource_mgt/archaeology-Protecting_Archaeological

Soil Survey Staff
2019 Web Soil Survey. Natural Resources Conservation Service, United States Department of Agriculture. Available online at the following link: https://websoilsurvey.sc.egov.usda.gov/. Accessed 7/10/2019.

Story, Dee Ann
1990 Cultural History of the Native Americans. In *The Archeology and Bioarcheology of the Gulf Coastal Plain,* by Dee Ann Story, Janice A. Guy, Barbara A. Burnett, Martha Doty Freeman, Jerome C. Rose, D. Gentry Steele, Ben W. Olive, and Karl J. Reinhard, pp. 163-366. Arkansas Archeological Survey Research Series 38. Arkansas Archeological Survey, Fayetteville, Arkansas.

Thoms, Alston V.
2004 Natural Resource Structure and Land-Use Potential in the Middle Reach of the Yegua Creek Basin. In *Yegua Creek Archaeological Project: Survey Results from Lake Somerville State Parks and Trailway, East-Central Texas*, edited by Alston Thoms, pp. 9-27. Report of Investigations 5. Center for Ecological Archaeology, Texas A&M University, College Station, Texas.

Tomka, Marybeth
1992 *Archeological Testing and Monitoring at Bastrop State Park, Bastrop, Texas.* Letter Report 10. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Tomka, Marybeth S. F., and Daniel J. Crouch
1996 *Stone Projectile Points to World War II Tank Destroyers and Land Mines: Intensive Archeological Survey at Lake Bastrop State Park, Bastrop County, Texas*. Cultural Resources Program, Texas Parks & Wildlife Department, Austin.

Tomka, Steve A., and Antonia L. Figueroa
2006 Conclusions and Recommendations. Chapter 7 in *Archaeological Testing at 41BP678, Bastrop County, Texas,* by Antonia Figueroa, pp. 43-44. Center for Archaeological Research, The University of Texas at San Antonio.

Turner, Ellen Sue, Thomas R. Hester, and Richard L. McReynolds
2011 *Stone Artifacts of Texas Indians*. Taylor Trade Publishing, New York.

U.S. Department of Interior, National Park Service
2003 *Fire Monitoring Handbook*. Fire Management Program Center, National Interagency Fire Center, Boise, Idaho.

Waters, Michael R., Steven L. Forman, Thomas A. Jennings, Lee C. Nordt , Steven G. Driese, Joshua M. Feinberg , Joshua L. Keene, Jessi Halligan, Anna Lindquist, James Pierson, Charles T. Hallmark, Michael B. Collins, and James E. Weiderhold
2011 The Buttermilk Creek Complex and the Origins of Clovis at the Debra L. Friedkin Site, Texas. *Science* 331:1599-1603.

Weddle, Robert S.
2012 *Archival and Archeological Research: Camino Real de los Tejas and Texas State Parks*. Historic Sites and Structures Program, Texas Parks & Wildlife Department, Austin.

Wells, Tom
1998 Nail Chronology: The Use of Technologically Derived Features. *Historical Archaeology* 32(2):78-99.

Wilcox, David, Kevin A. Miller, and Steve Carpenter
2007 *Cultural Resources Survey of 28 Miles of Prescribed Fire Burn Lanes, Bastrop State Park, Bastrop County, Texas*. Cultural Resources Report 2007-146. SWCA Environmental Consultants, Austin, Texas.

Willey, Gordon R., and Philip Phillips
1958 *Method and Theory in American Archaeology*. University of Chicago Press, Chicago.

APPENDIX A—A BRIEF HISTORY OF YEWPON, TEXAS

by Margaret Howard

Sites 41BP834, 41BP872, and 41BP873 in the east part of Bastrop State Park are believed to be associated with the community of Yewpon, which had a post office from 1902 through 1918 (U.S. Postal Service 2017). Settlement in the Alum Creek area had begun as early as the mid-nineteenth century (Kesselus 1987:11, 36). The 1902 USGS Bastrop Quadrangle shows several structures labeled Cottletown Settlement along Gotier Trace east of Alum Creek, in an area just outside present-day Bastrop State Park.

YEWPON COMMUNITY

The first record of Yewpon dates to 1902, when a post office was established there. When the Alum Creek post office closed, the new post office was established 1 mile north of it and 8 miles east of Bastrop. Peter Hanson was designated as postmaster. Mail was delivered to the community twice weekly at first, and in 1905 it was increased to three times per week (*The Bastrop Advertiser*, May 31, 1902; March 4, 1905).

In 1903 *The Bastrop Advertiser* published a glowing account of Yewpon that was written by "Becky," which provides one of the most complete descriptions of the settlement:

> Now here we are, and have had no news from our new established city in the Pine woods; now Mr. Editor you would certainly not object to giving space in your columns for the little changes that have been made in our village of late; yes grown from village to a city in name, at least you can come right out of the Piney woods and get right directly in the Big Brode Street of what we now call Jersey Street and see the saw mill. Of course you must first cross Seven-up Branch. There is no entrance to our city until you cross this Branch, you then simply pass right along until you find our postmaster, P. A. Hanson, where you can deposit all communications to your absent loved ones, the mail leaving his office twice a week . . . Prof. J. B. Patty will see you, if you pass his way as he is always on the alert for all comers and goers. The health of our city is good. . . . I am yours, with the hope that Yewpon will soon have a big population, and be numbered among the growing cities of old Bastrop (*The Bastrop Advertiser*, January 3, 1903).

The saw mill in Yewpon was run by Professor Patty in 1903, and he was a part-time resident. The mill had been stopped in May, probably until fall of that year, as Patty had gone to his farm in Waller County. The "hands" employed by Patty had "begun burning charcoal since the mill stopped, which is a comparatively new industry to this part of the country. They find a ready market for their coal at Bastrop and Smithville" (*The Bastrop Advertiser*, May 9, 1903). The

Yewpon mill may have passed to J. L. Scoggins in 1911, for he sought a partner to invest $350 for half interest in a well-established saw mill in Yewpon (*The Houston Post*, April 4, 1911).

It appears that no schools were established in Yewpon. In 1902 the Alum Creek school had 33 students and was taught by Miss Willie Strother; trustees were T. H. Rolston, L. E. Rhodes, and W. H. Patty. Although its post office is listed as Yewpon, the school apparently was in the old Alum Creek settlement. The school at Antioch also had a postal address of Yewpon (*The Bastrop Advertiser*, December 6, 1902; March 12, 1910), so the three communities were interconnected.

Miss Pollie Morgan of Bastrop taught at the Alum Creek school in 1905 (*The Bastrop Advertiser*, April 15, 1905). In 1908, Julia Hewatt reported that the school term started in mid-November and the teacher was Miss Maude Gray (*The Houston Post*, November 1, 1908). The schools in Alum Creek and Antioch may have closed by 1911, when Iva Gray of Yewpon enrolled in the Bastrop Normal School; by 1915, Ruth and Ima Hardy of Yewpon also enrolled in that school (*The Bastrop Advertiser*, March 24, 1911, February 26, 1915).

The names of a number of Yewpon residents are known through their mention in *The Bastrop Advertiser*: C. B. Adams (November 5, 1904), J. C. Byran or Byrum (March 14, 1903; June 11, 1904), J. A. Hewatt, former Bastrop County Precinct 1 Commissioner (February 27, 1904), J. T. Kimbrough (December 12, 1903), Professor W. F. Mobley (June 16, 1906; February 2 and November 30, 1907), W. H. Morgan (September 23, 1905; June 22, 1907; January 25 and April 4, 1908), and J. W. Smith (November 3, 1906). Yewpon residents also were noted in other newspapers: Miss Royston (*The Daily Express* [San Antonio, Texas], June 10, 1906), John Wesley Gray (*The Houston Post*, April 28, 1907), and Juliette Hewart (Hewatt?) (*The Houston Post*, May 25, 1908).

In 1910, a "Looker On" provided a report on Yewpon Happenings that testifies to the interconnectedness of the Alum Creek, Yewpon, and Antioch communities:

> Well Mr. Editor we want to describe our territory so you will know how far it extends. We claim Alum Creek of course, where we have regular preaching every fourth Sunday in each month by our new and able minister Rev. Stucky and our congregation is highly pleased with him. We have also a well organized Sunday School every Sunday evening, also prayer meeting every Sunday night. We claim Antioch and were there nearly all day yesterday with a good number of neighbors and friends to see and enjoy the closing exercises of our public school which was taught by Miss Maud Gray . . . All at once we heard the cry of Dinner and behold we saw Uncle Bill with a large box. He called for help and all responded and tried to eat all the dinner the Antioch and Alum Creek ladies had. The Yewpon Postmaster did his best, so did Uncle Bill, Joe Gray and others but to no avail, there was plenty left . . . After the closing exercises we had 12 freezers of ice cream to

> attend to and then we went home, leaving Uncle Bill, Bro. Joe Gray and others still trying to eat more. The pleasant day spent at the Antioch school house will be long remembered (*The Bastrop Advertiser*, March 12, 1910).

The fledgling town of Yewpon may have had no doctor. Postmaster Hanson reported a "good deal of sickness in his neighborhood, mostly malarial" in 1903 (*The Bastrop Advertiser*, August 29, 1903). Later that year, "Grand-pa" Kimbro died in the Alum Creek neighborhood near the Yewpon post office. He fell ill one morning and died that night. He was said to be a new resident of that community (*The Bastrop Advertiser*, August 29, 1902).

In addition to the saw mill, agriculture was an industry that supported Yewpon residents. W. F. Mobley of the Yewpon neighborhood reported that the weather was extremely dry and the corn was "suffering for rain" (*The Bastrop Advertiser*, June 16, 1906). Four years later, the Yewpon Looker On noted that "everybody seems to be very healthy and judging the way things are moving on our little farms we shouldn't wonder if this doesn't get to be one of the greatest health resorts in our land" (*The Bastrop Advertiser*, March 12, 1910).

Official duties did not occupy all of Postmaster Hanson's time by 1911, when he advertised that he was providing building and contracting services (*The Bastrop Advertiser*, January 11 through March 24, 1911). Later that year he sold Yewpon mayberries, a cross between blackberries and dewberries, at the price of $4.00 per 100 plants (*The Bastrop Advertiser*, November 3, 1911). Hanson had stepped down from his position as postmaster by September of 1912, when W. B. Dawson was appointed to that post (*The Bastrop Advertiser*, September 13, 1912; U.S. Postal Service 2017).

Postmaster Dawson lost that job six years later. Although the Yewpon post office is listed in city directories published in 1919, official records indicate that service there was discontinued on July 15, 1918, when the mail was forwarded to Paige (U.S. Postal Service 2017).

The published lists of individuals who registered for the draft in 1917 and 1918 included W. B. Dawson (U.S. Selective Service System 2017). Other Yewpon registrants were August H. Hoffman, Jacob H. Hoffman, and Richard O. S. Parker (*The Bastrop Advertiser*, June 30 and July 6, 1917; May 17, 1918). Mr. and Mrs. Nick Schutz of Yewpon visited Bastrop in 1918 (*The Bastrop Advertiser*, May 13, 1918), which is the final year when Yewpon was mentioned in the Bastrop newspaper. That post office, and possibly the community around it, appear to have risen and fallen within a span of 20 years.

YEWPON POSTMASTER W. B. DAWSON

Deed research on the property owned by W. B. Dawson suggests that his Yewpon homestead was on land in present-day Bastrop State Park, although he cannot be directly associated with the early twentieth century homesteads represented by archeological sites 41BP834 and 41BP872.

William Beony Dawson was born in Kentucky on November 21, 1876. In 1880 his family resided in Bastrop County; he was the sixth of seven children born in Texas to his father Wiley Jones Dawson, who was born in Kentucky, and his mother Sarah Jane Dawson (née Bryant), born in Texas. The senior Dawson's profession was listed as farmer in the 1880 census (U.S. Census. Texas. Bastrop County 1880).

W. B. Dawson was 32 when he married Alma J. Kohler on October 31, 1908; it is through her inheritance that they would come to own land in Yewpon that is now in Bastrop State Park. In 1910 they lived in Justice Precinct 1 in Bastrop County, and W. B.'s profession was said to be farmer (U.S. Census. Texas. Bastrop County 1910). He assumed the position of Yewpon postmaster on September 7, 1912.

At the time when he registered for military service in 1917, W. B. Dawson's profession was still said to be farmer, even though he was also serving as postmaster. His registration card lists his physical characteristics as short and stout, and his hair was gray, although he was only 41 years old (U.S. Selective Service 2017).

Dawson's bride Alma J. Kohler was born in Texas in 1884 to parents John A. and Pauline Kohler; her siblings were Arthur Henry and Gus Kohler. Her father had passed away and her mother had remarried by 1914, when Pauline Kreidel granted a 250 acre tract of land to Mrs. Alma J. Dawson. The west boundary of the property adjoined Alum Creek (Bastrop County Deed Record 55:623-624). While the precise location of the Dawson property is unknown, it falls within the 997 acre Stewart tract that TPWD purchased in 2000. Gotier Trace runs along the south boundary of that tract.

It seems likely that the Dawsons occupied the property that had been given to Alma in 1914, as W. B. had been designated as Yewpon postmaster in 1912; he lost that position in July of 1918 when the post office was moved to Paige (U.S. Postal Service 2017). Possibly apprehensive about the decline of the settlement, a W. B. D. of Yewpon made an offer to trade 212 acres of fenced post oak land on the Serbin Road for a place in town (*The Bastrop Advertiser*, February 15, 1918). Gotier Trace connects to present-day Bastrop/Lee County Road 2239, which still passes through the community of Serbin.

In November of 1918, W. B. and Alma J. Dawson purchased a lot in the town of Bastrop from A. H. Kohler (her brother Arthur Henry?) (Bastrop County Deed Record 66:435). They are not listed in the 1920 census, but the 1930 census found them on an unnamed street in "Bastrop town." By that time they had two daughters: Leah (17) and Mabel (14). W. B.'s profession is listed as mail carrier (U.S. Census. Texas. Bastrop County 1930).

In 1933 and 1934, Alma Dawson purchased the other parts of the parcel that her mother Pauline Kreidel had granted to her three children. The land she bought from May Kohler (widow of Arthur Henry Kohler) and from Gus and Ethel Kohler was described by each party as "one-third undivided interest in and to the estate of Pauline Kriedel." Alma held the property until 1941,

when she and W. B. sold the tract encompassing around 943 acres to a buyer outside the family (Bastrop County Deed Record 92:332-333, 94:295-296, 104:484-486). That land comprises almost all of the Stewart tract that TPWD purchased in 2000.

The year 1940 found the Dawson family in the city of Bastrop. W. B. and Alma were living on Chestnut Street in a household that included their daughter Leah Spooner and granddaughter Mable (U.S. Census. Texas. Bastrop County 1940). Still working full time at age 63, W. B.'s profession was listed as rural mail carrier. Alma passed away 6 years later. W.B. died in Bastrop in 1954, and on his death certificate he was said to be a retired mail clerk (Texas Department of State Health Services 2017). The inventory of his estate included the house that he and Alma bought in 1918 on property that fronted on Jefferson Street and included a small rent house (Bastrop County Probate Minutes 3:612). The Dawson house still stands on the northeast corner of Chestnut and Jefferson Streets in Bastrop, and was listed in the National Register of Historic Places in 1978 due to the significance of its Late Victorian architecture. W. B. and Alma Dawson are buried in Fairview Cemetery in Bastrop.

SUMMARY

A concentration of isolated artifacts, two homesteads (41BP834 and 41BP872) and a dump (41BP873) in Bastrop State Park contain artifacts that date to the first two decades of the twentieth century. This cluster of cultural resources apparently indicates the location of the short-lived (1902-1918) community of Yewpon. W. B. Dawson served as Yewpon Postmaster from 1912 through 1918; his association with the area through inheritance of property by his wife Alma strengthens the likelihood that these archeological sites represent part of the community of Yewpon. Further research will be required to identify the locations of the Dawson property, the post office, and the saw mill.

REFERENCES CITED

Bastrop County Deed Records

Bastrop County Probate Minutes

Kesselus, Kenneth
1987 *History of Bastrop County, Texas, 1846-1865*. Jenkins Publishing Company, Austin.

Texas Department of State Health Services
2017 Texas Death Certificates, 1903-1982. Electronic document, accessed at http://interactive.ancestry.com/2272/40394_b062450-02022?pid=22576699&backurl=http://search.ancestry.com/cgi-bin/sse.dll?_phsrc%3DRbF2%26_phstart%3DsuccessSource%26usePUBJs%3Dtrue%26gss%3Dangs-g%26new%3D1%26rank%3D1%26msT%3D1%26gsfn%3DW.B.%26gsfn_x%3D0%26gsln%3Ddawson%26gsln_x%3D0%26msypn__ftp%3DBastrop%2520County,%2520Texas,%2520USA%26msypn%3D246%26msypn_PInfo%3D7-%257C0%257C1652393%257C0%257C2%257C0%257C46%257C0%257C246%257C0%257C0%257C0%257C%26msypn_x%3D1%26msypn__ftp_x%3D1%26msbdy_x%3D1%26MSAV%3D1%26msbdy%3D1876%26msddy%3D1954%26cp%3D0%26catbucket%3Drstp%26pcat%3DROOT_CATEGORY%26h%3D22576699%26recoff%3D10%252054%26dbid%3D2272%26indiv%3D1%26ml_rpos%3D3&treeid=&personid=&hintid=&usePUB=true&_phsrc=RbF2&_phstart=successSource&usePUBJs=true, January 26, 2017.

The Houston Post

The Bastrop Advertiser

U.S. Postal Service
2017 Record of Appointment of Postmasters, 1832-1971. NARA Microfilm Publication, M841, 145 rolls. Records of the Post Office Department, Record Group Number 28. Washington, D.C., National Archives. Electronic document, http://interactive.ancestry.com/1932/30439_065506-00196/774565?backurl=http%3a%2f%2fsearch.ancestry.com%2fcgi-bin%2fsse.dll%3fgst%3d-6&ssrc=&backlabel=ReturnSearchResults, accessed January 26, 2017.

U. S. Selective Service System
2017 *World War I Selective Service System Draft Registration Cards, 1917-1918*. Washington, D.C.: National Archives and Records Administration. M1509, 4,582 rolls. Electronic document, http://search.ancestry.com/cgi-bin/sse.dll?_phsrc=XcO9&_phstart=successSource&usePUBJs=true&gss=angs-g&new=1&rank=1&msT=1&gsfn=william%20benny%20&gsfn_x=0&gsln=dawson&gsln_x=0&MSAV=1&gskw=draft&cp=0&catbucket=rstp&pcat=ROOT_CATEGORY&h=17164956&dbid=6482&indiv=1&ml_rpos=2, accessed January 26, 2017.

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