National Register Testing of Nine Archeological Sites at Waco Lake, McLennan County, Texas

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by

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ABSTRACT

From October 2000 to February 2001, Prewitt and Associates, Inc., conducted National Register of Historic Places eligibility testing of nine sites located at Waco Lake in McLennan County, Texas. The U.S. Army Corps of Engineers, Fort Worth District, sponsored the project as a result of the proposed plan to raise the conservation pool level of the lake by 7 ft. Of the nine sites, two are historic (41ML140 and 41ML179), six are prehistoric (41ML160, 41ML162, 41ML185, 41ML186, 41ML194, and 41ML195), and one contains both prehistoric and historic components (41ML135). Testing at 41ML135 investigated only the prehistoric component, since the proposed raising of the lake will not impact the historic one.

Four prehistoric sites—41ML160, 41ML162, 41ML185, and 41ML195—have the capacity to contribute important information and are considered eligible for National Register listing based on their good contextual integrity and the presence of stratigraphically isolable components with sufficient quantities of artifacts and other materials for interpretation. Data recovery excavations are recommended at the two most-productive and best-dated of these—41ML162 and 41ML195—along with two National Register-eligible sites—41ML35 and 41ML37—tested previously. Prehistoric sites 41ML135, 41ML186, and 41ML194 are judged to be ineligible for National Register listing because they yielded so few artifacts and other cultural materials that they lack the capacity to yield any important information. The two historic sites are considered ineligible for National Register listing because of the sparseness of contexts containing isolable early assemblages at 41ML140, the scarceness of diagnostic attributes useful for interpretation in the assemblage from 41ML179, and the inability at both sites to address issues related to overall plantation/farmstead layout.

ACKNOWLEDGMENTS

The completion of this project would not have been possible without the hard work and cooperation of many individuals. Ann M. Scott served as Project Archeologist with the guidance of Co-Principal Investigators, Ross C. Fields and Karl W. Kibler. Historic Archeologist Marie E. Blake offered advice and supervised aspects of the field operations at the historic sites. Mr. Kibler also served as Project Geomorphologist. Appreciation is extended to the crew for their perseverance in the face of numerous delays during the project. Project crew members were Ardi Eggleston, Timothy P. Everette, Timothy Gibbs, and Rob Thrift. Mr. Thrift performed the site mapping with a total station.

Additional individuals who aided in the completion of this project include personnel from the U.S. Army Corps of Engineers, Waco Lake Office and Fort Worth District Office, and the City of Waco Water Utilities Department. Billy Haferkamp and Kathy Gately of the Waco Lake Project Office provided land access and logistical assistance. James Sexton and Danny Jackson, of the City of Waco, coordinated backhoe and trackhoe operations. Steve Bradbury conducted the initial trenching. John McMillan, who skillfully excavated trenches at most of the sites, replaced Mr. Bradbury. John's contributions, and servings of venison sausage, are greatly appreciated. Dr. Jay R. Newman, U.S. Army Corps of Engineers, Fort Worth District, served as Technical Representative and supervised the coordination required for the project.

The staff at Prewitt and Associates provided their expertise through comments and advice throughout all phases of the project. Most of the background information for this report was borrowed from *Re-Location and Updated Recordation of 44 Archeological Sites at Waco Lake, McLennan County, Texas*, by Kimberly K. Kvernes, Marie E. Blake, Karl W. Kibler, Jennifer K. McWilliams, E. Frances Gadus, and Ross C. Fields.

Mr. Fields and Mr. Kibler offered constructive comments during field operations and report production. Artifacts were washed and cataloged by Jonathan Grant and Mr. Thrift under the supervision of Laboratory Director Karen M. Gardner. Ms. Gardner also examined the mussel shell collection for identifiable specimens and tabulated the results. Elton R. Prewitt typed the projectile points. Brian J. Wootan prepared the illustrative materials. Jack Rehm conducted the artifact photography. Consultants who contributed to the data analysis are Brian S. Shaffer (analysis of vertebrate fauna) and Dr. J. Phil Dering (identification of macrobotanical specimens). Mr. Fields and Audra L. Pineda edited the report, and Ms. Pineda produced it.

INTRODUCTION

1

From October 2000 to February 2001, personnel from Prewitt and Associates, Inc., conducted National Register of Historic Places eligibility testing of nine sites located at Waco Lake in McLennan County, Texas. The U.S. Army Corps of Engineers, Fort Worth District, sponsored the project as a result of the proposed plan to raise the conservation pool level of the lake by 7 ft to 462 ft above mean sea level.

Waco Lake is located in central McLennan County, Texas, on the west side of the City of Waco (Figure 1). It is on the Bosque River, with the dam lying ca. 6.6 km upstream from where the Bosque flows into the Brazos River. Two arms extend west and south from the main body of the lake following the North Bosque and South Bosque Rivers. Two major tributaries, Hog Creek and the Middle Bosque River, enter the southern arm from the west. No major streams feed the lake from the east. The original dam was completed in 1929, and at an elevation of 430 ft, the lake covered ca. 2,700 acres. In 1965, a new dam was finished and the level raised to 455 ft, with the new conservation pool covering ca. 7,300 acres.

ENVIRONMENTAL BACKGROUND

Geology, Geomorphology, and Soils

Waco Lake lies at the eastern edge of the Grand Prairie, which is separated from the Blackland Prairie farther to the east by the Balcones Fault Zone (Hill 1901:72). The eastern shore of the lake is bordered by the westward-facing White Rock escarpment or *cuesta*, consisting of outcrops of the Upper Cretaceous South Bosque, Lake Waco, and Austin Chalk Formations (Hayward 1988:332; Hill 1901:331–332; Proctor et al. 1970). The first two formations consist of limestone and shale, while the third is composed of chalk and marl. This escarpment, which rises ca. 60 m above the level of Waco Lake, constitutes the western edge of the Balcones Fault Zone (Burket 1965:158). The west side of Waco Lake and the inundated valleys of the North Bosque River, Hog Creek, Middle Bosque River, and South Bosque River are set in Lower Cretaceous marls, shales, and limestones of the Grayson, Main Street, Pawpaw, Weno, Denton, Fort Worth, and Duck Creek Formations (Proctor et al. 1970). In general, the Grand Prairie landscape associated with these lithological units consists of flat to gently rolling uplands, with the major streams and rivers being entrenched and often bordered by limestone cliffs.

The streams of the larger valleys, such the North Bosque, Hog Creek, Middle Bosque, and South Bosque, are flanked by terraces and floodplains of late Quaternary alluvium. In addition, late Quaternary deposits of colluvium flank some of the lower slopes of these valleys, merging and interfingering with the alluvial deposits. In 1984 and 1985, Collins and Holliday (1985) conducted a geomorphological reconnaissance of Waco Lake. The primary thrust of this study was to identify the potential of various landforms around the margins of the lake to contain archeological sites of varying ages and in varying geomorphic contexts. Three basic settings were identified: lower alluvial surfaces, higher alluvial surfaces, and colluvial slopes.

Lower alluvial surfaces composed of Holocene alluvium were found to be well represented along the North and South Bosque Rivers at the upstream ends of the lake. Judging from the geologic map of the area (Proctor

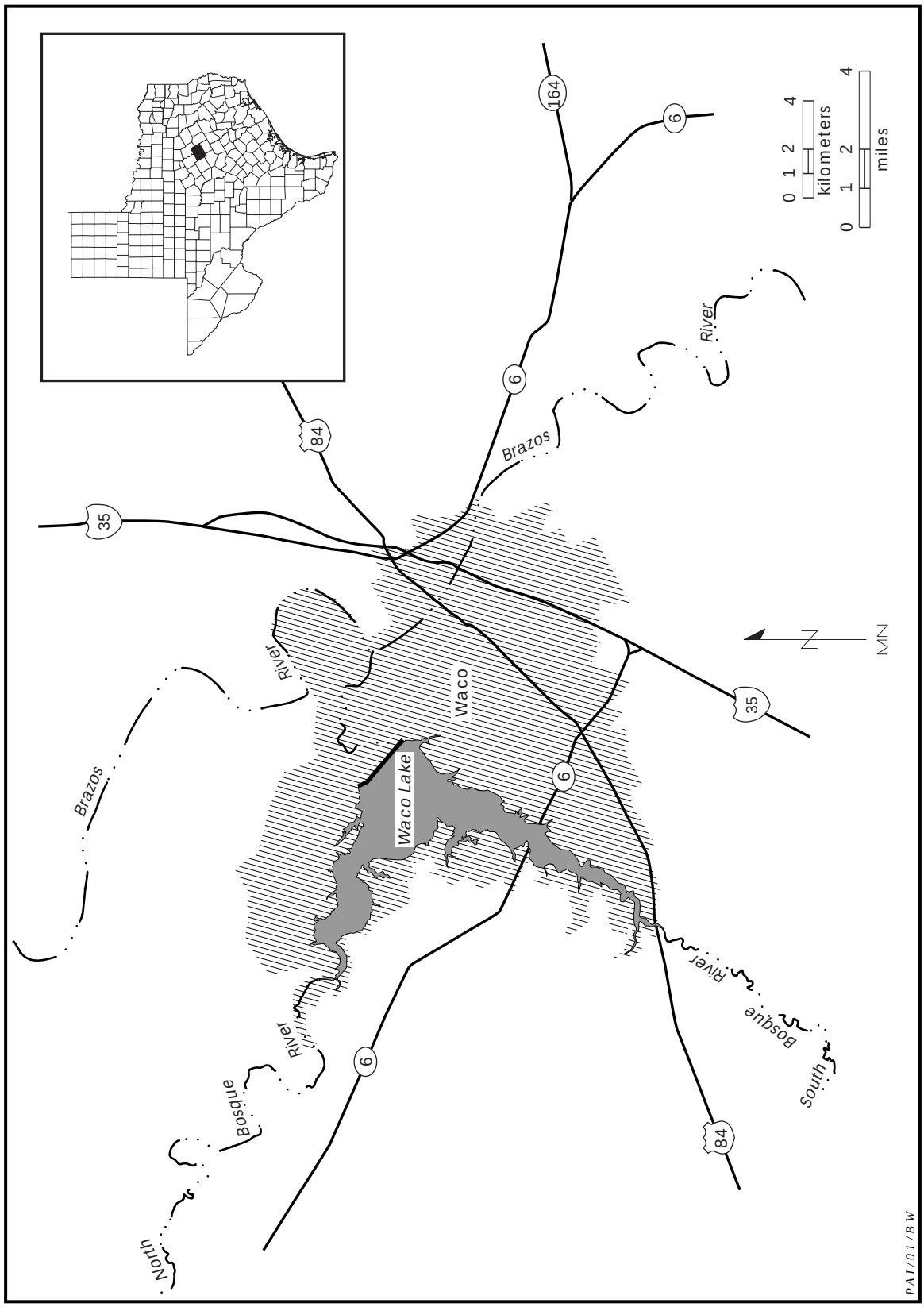

Figure 1. Project location map.

et al. 1970), comparable deposits extend up the Middle Bosque River and Hog Creek as well (Figure 2). The deposits tend to be silty and clayey sediments reflecting a variety of depositional settings, including levees, point bars, and floodplains (Collins and Holliday 1985:36). These deposits can be several meters thick, and while in many exposures they look at least moderately youthful (i.e., no older than the late Holocene) it is almost certain that older sediments are encompassed within these landforms. Mapped soils on the lower alluvial surfaces belong to the Catalpa series and are described as "grayish-brown to dark grayish-brown calcareous alluvial soils made up of little-altered recent stream sediments" (Templin et al. 1958:47). The lower alluvial surfaces are known to contain stratified archeological deposits with the capacity to yield abundant valuable information.

Higher alluvial surfaces are extensive along the west and north sides of the lake (see Figure 2). They consist of weathered, often gravelly deposits that usually are considered to be of Pleistocene age, although it has been suggested that some of these deposits could be young enough to host Paleoindian archeological materials (Collins and Holliday 1985:36). While it appears that these sediments are associated primarily with the North Bosque River (Collins and Holliday 1985:36), contribution from the Brazos River is possible north of the lake. Mapped soils belong mostly to the Lewisville, Bell, and Payne series (Templin et al. 1958). Archeological sites on these landforms are uniformly thin (50 cm or less) and often multicomponent. Because of this, they have a relatively limited capacity to contribute important information.

Colluvial slopes occur most consistently along the eastern side of the lake. Where slopes are steep, little sediment accumulation occurs. However, some areas contain substantial Holocene colluvial deposits. These are likely to be complex depositional situations, with colluvium perhaps interfingering with alluvial deposits from the North and South Bosque Rivers and/or small streams that drain the slopes east of the lake. While such areas with thick Holocene colluvium are not extensive and, thus, have not been mapped as distinct soils, they have the potential to contain stratified archeological deposits in good geomorphic contexts. As observed by Kvernes et al. (2000), however, parts of the eastern lakeshore with Holocene colluvial deposits have suffered from severe erosion.

Climate

The McLennan County area has a humid, subtropical climate with an average growing season of 248 days (Natural Fibers Information Center 1987:343). The average daily maximum and minimum temperatures are 78º and 56ºF, while monthly means range from 46ºF in January to 86ºF in July and August. Precipitation comes almost entirely in the form of rainfall and has an annual mean of 31.0 inches. Typically, all months have nearly 2.0 inches or more of rain, but the wettest months are April, May, September, and October, which have means of 3.8, 4.7, 3.2, and 3.1 inches.

Flora and Fauna

Waco Lake, at the eastern edge of the Grand Prairie, is in an area characterized by grasslands and post oak savannah, with riparian woodlands along stream channels. The area supports floral and faunal communities common to both the Texan and Balconian biotic provinces (Blair 1950). Dominant native grass species include big bluestem, little bluestem, and Indiangrass, while trees include oaks, pecan, elm, and hackberry. Today, both junipers and mesquites are much more common than they were in the past. The region is home to 57 species of mammals, 16 lizards, 39 snakes, 7 urodeles, and 13 anurans (Blair 1950:100–101, 112–115). Probably among the more-important animals prior to modern times were white-tailed deer, bison, rabbits and other small mammals, turkey, mussels, and a variety of fish that occupied the North, Middle, and South Bosque Rivers and Hog Creek.

PREVIOUS ARCHEOLOGICAL INVESTIGATIONS

Waco Lake was constructed prior to professional archeological investigations in that specific area. However, avocational archeologists associated with the Central Texas Archeological Society conducted investigations in the general vicinity before the lake was built. Frank Bryan (1936, 1937) was interested in identifying deeply buried sites along streams in the

Figure 2. Landforms around Waco Lake.

area. Frank H. Watt was especially prolific, with articles on several important sites published from the late 1930s to the 1970s. These include Aycock Shelter (Watt 1936), the Chupik site (Watt 1941), the Asa Warner site (Watt 1956), the Clark site (Watt 1965), the Waco Indian Village site (Watt 1969), and Horn Shelter No. 2 (Watt 1978).

Two expansions of the flood pool at Waco Lake were preceded by professional archeological work. In the 1950s, a survey identified 23 sites, most of which appeared to have Archaic components (Duffield 1959). Two of the most significant sites subsequently tested were the Baylor and Britton sites. Both had deep stratified deposits that were used to help establish the cultural chronological sequence for the central Brazos area and central Texas in general (Story and Shafer 1965).

The Baylor site was divided into two areas, with Area A representing the southern area within recent alluvium and Area B representing the northern, higher alluvial surface. Test excavations consisting of 25 units (5x5 ft) revealed that deeply buried cultural deposits were present in Area A, with Area B containing only surface deposits. Excavations in Area A revealed cultural materials to a depth of 3.6 m. Artifacts diagnostic of the Austin and Toyah phases were found at 0.45–0.81 m below the surface, as were six stone-lined hearths. At 0.60–1.00 m, Late Archaic diagnostics were recovered. Middle and Late Archaic artifacts occurred from 1.00 to 1.80 m (Story and Shafer 1965:72). The Area A test excavations also produced bones, mussel shell artifacts, and ceramic sherds.

At the Britton site, artifacts were observed in 5.5-m-thick alluvial deposits. Testing consisted of 11 hand-dug units (5x5 ft) and 20 backhoe trenches (Story and Shafer 1965). The trenches were excavated to a maximum depth of 3 m, while the hand-dug units were excavated to maximum depths of 0.3 to 5.2 m, with little excavation below 3.0 m. The excavations encountered stratified cultural deposits to at least 3.0 m, with only scattered charcoal found at greater depths. Diagnostic artifacts from the upper 3 m indicate occupations primarily during the Late Archaic period (Story and Shafer 1965:132–136). In addition to diagnostic artifacts, the excavations produced modified mussel shells and bone artifacts, as well as unmodified faunal remains. The 49 features recorded include ash lenses, hearths, mussel shell concentrations, and a possible multiple dog burial. Four radiocarbon assays yielded ages ranging from 1865 to 2330 B.P., confirming occupations within the Late Archaic period.

Archeological investigations were initiated in 1984 by another plan to raise the level of the flood pool. This work entailed an intensive survey of the impact area, providing an overview of all known sites. A total of 83 previously recorded and newly recorded sites were evaluated, and test excavations were conducted at 16 sites (Prikryl and Jackson 1985; Prikryl and Prewitt 1984). Prehistoric sites ranged in age from Early Archaic through the Late Prehistoric Toyah phase and consisted of both shallowly buried occupations on old landforms and sites, such as Baylor and Britton, buried within Holocene alluvium. Part of the survey focused on the identification of 41 sites with historic materials ranging in age from the 1840s to the 1960s. Included in this survey was the central core and outlying farmsteads/housesites of the community of Speegleville. Conducted partly in conjunction with this survey was a geoarcheological study that identified the archeological potential of various landforms in the project area, as well as locating a number of archeological sites that subsequently were visited by the survey crew (Collins and Holliday 1985).

After a hiatus of almost a decade and a half, renewed plans to raise the lake level led to limited archeological investigations in 1999 (Kvernes et al. 2000). This project consisted of a re-location survey of 44 previously recorded sites (41 assessed as eligible or potentially eligible for listing in the National Register of Historic Places as a result of the 1984–1985 survey, along with 3 sites not addressed during that project) to assess their current condition, re-record them, and reassess the National Register eligibility of each site. Two sites with prehistoric components (Baylor and Britton) were recommended as being eligible for listing in the National Register, while 14 were considered ineligible. The remaining 14 sites with prehistoric components were of unknown eligibility, with additional testing required before a determination could be made. Seven of these sites appeared to be the best candidates for further work based on their elevations and the impacts anticipated as a result of raising the lake level (these are the 7 prehistoric sites tested during

the project reported in this volume). Four sites with historic components were considered to be of unknown eligibility, pending additional field investigations and/or archival research; 2 of these appeared to be the best candidates for further work based on their elevations and the anticipated impacts (testing of these 2 sites is reported in this volume). The remaining 12 sites with historic components were considered ineligible for listing in the National Register.

ARCHEOLOGICAL AND HISTORICAL BACKGROUND

2

PREHISTORIC PERIOD

The prehistoric archeological record of the middle Brazos River valley and Waco area traditionally has been viewed as part of the central Texas archeological region (e.g., Prewitt 1981; Suhm 1960). This region is recognized based on decades of investigations at various stratified sites throughout areas of the Edwards Plateau, its highly dissected eastern and southern margins, and the margins of physiographic regions to the east and south (see Collins [1995] for review). The Waco area is on the periphery of the central Texas archeological area, and the archeological record and projectile point style sequences contain elements that suggest influences and contacts to varying degrees over time with areas to the east and northeast (Collins 1995; Johnson and Goode 1994). A better understanding of the area's archeological record has been obtained through several large-scale projects, including Waco Lake (Collins and Holliday 1985; Duffield 1959; Prikryl and Jackson 1985; Prikryl and Prewitt 1984; Story and Shafer 1965). Other nearby large-scale projects—primarily reservoir salvage projects—include Whitney Lake (Jelks 1953, 1962; Stephenson 1947, 1970) and Aquilla Lake (Brown 1987; Lynott and Peter 1977; Skinner et al. 1978; Skinner and Henderson 1972) to the northwest and north; Hog Creek Reservoir (Hays and Kirby 1977; Henry 1995; Henry et al. 1980; Larson and Kirby 1976; Larson et al. 1975; Shafer 1977) to the west; and Stillhouse Hollow Reservoir (Sorrow et al. 1967), Belton Lake (Miller and Jelks 1952; Shafer et al. 1964), and Fort Hood (Abbott and Trierweiler 1995; Kleinbach et al. 1999; Mehalchick et al. 1999, 2000; Trierweiler 1994, 1996) to the southwest. Kvernes et al. (2000:7–12) provide summaries of these projects. These projects as well as others aided in establishing the prehistoric cultural sequence that we understand and recognize today for the region. Generally, this sequence is divided into three periods: Paleoindian, Archaic, and Late Prehistoric (Figure 3).

Paleoindian Period

Paleoindian (11,500–8800 B.P.) occupations of the central Texas region are represented by surficial and deeply buried sites, rockshelter sites, and isolated artifacts. The period often is described as having been characterized by small, highly mobile bands of foragers who were specialized hunters of Pleistocene megafauna. However, a more-accurate view of Paleoindian lifeways probably includes the utilization of a much wider array of resources. Recent investigations at the Wilson-Leonard site (41WM235) and the Aubrey Clovis site (41DN479) support this view and have challenged the fundamental defining criterion of the Paleoindian period, that of artifacts in association with late Pleistocene megafauna (Collins 1998; Ferring 2001).

Collins (1995) divides the Paleoindian period into early and late subperiods. Two projectile point styles, Clovis and Folsom, are included in the early subperiod. Clovis chipped stone artifact assemblages, including the diagnostic fluted lanceolate Clovis point, were produced by bifacial, flake, and prismatic-blade techniques on high-quality and oftentimes exotic lithic materials (Collins 1990). Along with chipped stone artifacts, Clovis assemblages include engraved stones, bone and ivory points, stone bolas, and ochre (Collins 1995:381; Collins et al. 1992). Clovis, as well as a number of later

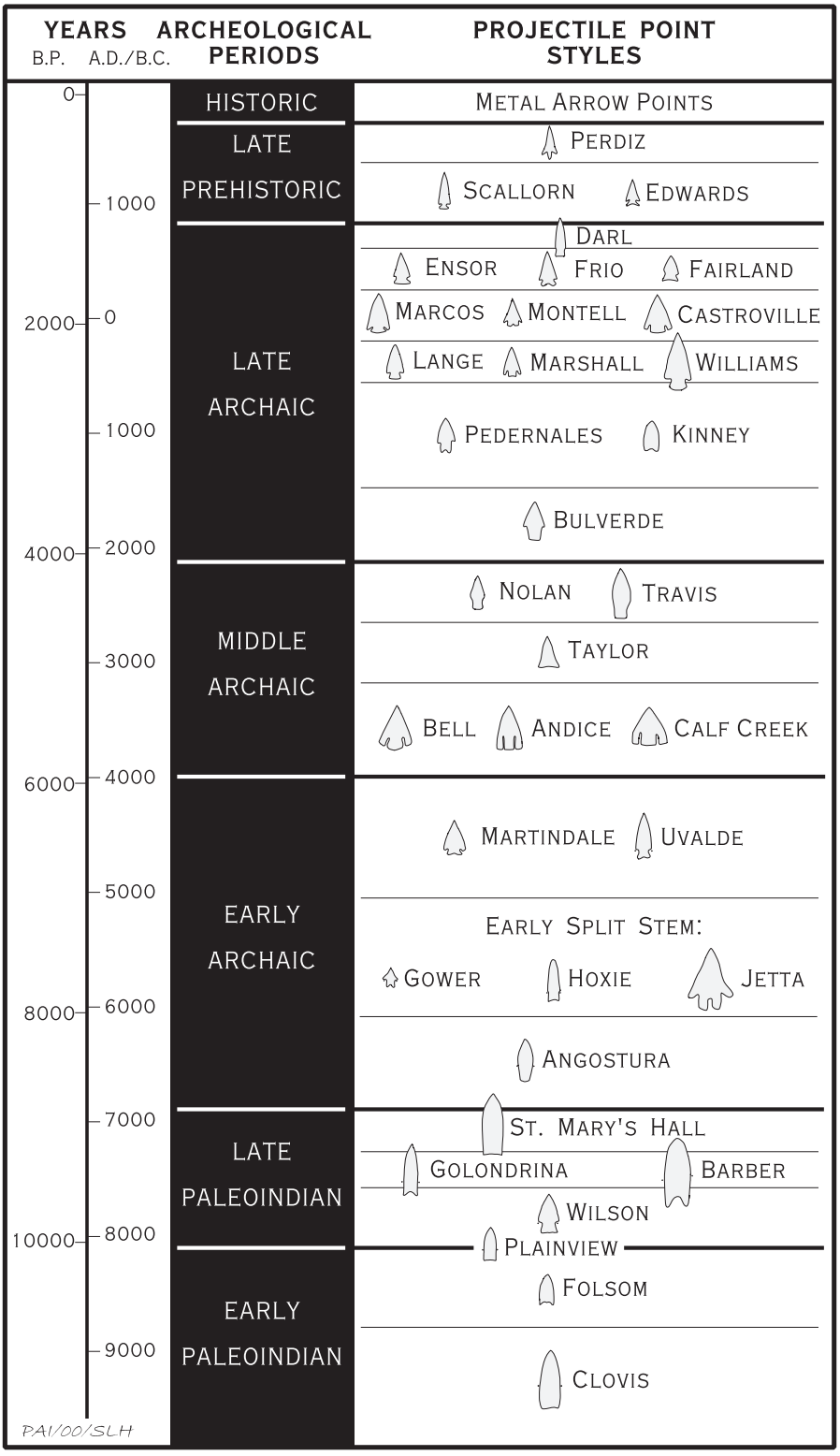

Figure 3. Prehistoric cultural sequence for central Texas (modified from Collins 1995:Table 2).

Paleoindian dart points, have been recovered from the Gault site in Bell County (Collins and Brown 2000) and the Triple S Ranch site in Hamilton County (Hatfield 1997). Probable Clovis polyhedral blade cores have been found in Hamilton County (Goode and Mallouf 1991). Analyses of Clovis artifacts and site types suggest that Clovis peoples were well-adapted, generalized hunter-gatherers who had the technology to hunt larger game but did not rely solely on such resources. In contrast, Folsom tool kits, consisting of fluted Folsom points, thin unfluted (Midland) points, large thin bifaces, and end scrapers, are more indicative of specialized hunting, particularly of bison (Collins 1995:382). Folsom points have been recovered from Horn Shelter No. 2 along the Brazos River (Redder 1985; Watt 1978).

Postdating Clovis and Folsom points in the archeological record are a series of dart point styles for which the temporal, technological, or cultural significance is unclear. Several of these styles were recovered from Horn Shelter No. 2 and include Plainview, Scottsbluff, Dalton, and San Patrice (Watt's [1978] Brazos Fishtail points). Often the Plainview type name is given to any unfluted, lanceolate dart point, however, Collins (1995:382) has noted that many of these points typed as Plainview do not parallel Plainview type-site points in thinness and flaking technology. Also problematic are the chronological position and cultural significance of Dalton and San Patrice dart points. Components and artifact and feature assemblages of the later Paleoindian subperiod appear to be Archaic-like in nature and in many ways may represent a transition between the early Paleoindian period and succeeding Archaic period (Collins 1995:382).

Archaic Period

The Archaic period for central Texas dates from ca. 8800 to 1300–1200 B.P. (Collins 1995). The Archaic period generally is believed to represent a shift toward the hunting and gathering of a wider array of animal and plant resources and a decrease in group mobility (Willey and Phillips 1958:107–108). In the eastern and southwestern U.S. and on the Great Plains, the Archaic period was succeeded by the development of horticultural-based, semisedentary to sedentary societies. In these areas, the Archaic truly represents a developmental stage of adaptation as Willey and Phillips (1958) define it. For central Texas, this notion of the Archaic is somewhat problematic. An increasing amount of evidence suggests that Archaic-like adaptations were in place prior to the Archaic (see Collins 1995:381–382; Collins 1998; Collins et al. 1990) and that these practices continued into the succeeding Late Prehistoric period (Collins 1995:385; Prewitt 1981:74). In fact, the Archaic period of central Texas is not a developmental stage, but an arbitrary chronological construct and projectile point style sequence. Collins (1995) and Johnson and Goode (1994) divide this sequence into three parts—early, middle, and late—based on perceived (though not fully agreed upon by all scholars) technological, environmental, and adaptive changes.

Early Archaic (8800–6000 B.P.) sites are small and their tool assemblages are diverse (Weir 1976:115–122), suggesting that populations were highly mobile and densities low (Prewitt 1985:217). It has been noted that Early Archaic sites are concentrated along the eastern and southern margins of the Edwards Plateau (Johnson and Goode 1994; McKinney 1981). This distribution may be indicative of climatic conditions at the time given that these environments have reliable water sources and a diverse resource base. Early Archaic projectile point styles include Angostura, Gower, Hoxie, Wells, Martindale, and Uvalde. Manos, metates, hammerstones, Clear Fork and Guadalupe bifaces, and a variety of other bifacial and unifacial tools are common in Early Archaic assemblages. The construction and use of rock hearths and ovens reflect a specialized subsistence strategy (possible exploitation of roots and bulbs) during the Early Archaic. These burned rock features most likely represent the technological predecessors of the larger burned rock middens that later developed extensively in the Archaic period (Collins 1995:383). Significant Early Archaic sites include the Youngsport site in Bell County (Shafer 1963), which yielded Gower and Wells dart points from deeply buried contexts.

During the Middle Archaic period (6000–4000 B.P.), the number and distribution of sites, as well as site size, increased due to probable increases in population densities (Prewitt 1981:73; Weir 1976:124, 135). Macrobands may have formed at least seasonally, or an increased

number of small groups may have utilized the same sites for longer periods of time (Weir 1976:130–131). A greater reliance on plant foods is suggested by the presence of burned rock middens toward the end of the Middle Archaic, although tool kits still imply a strong reliance on hunting (Prewitt 1985:222–226). Middle Archaic projectile point styles include Bell, Andice, Taylor, Baird, Nolan, and Travis. Bell and Andice points reflect a shift in lithic technology from the preceding Early Archaic Martindale and Uvalde point styles (Collins 1995:384). Johnson and Goode (1994:25) suggest that the Bell and Andice darts were parts of a specialized bison-hunting tool kit. They also suggest that the beginning of the Middle Archaic was marked by an influx of bison and bison-hunting groups from the Eastern Woodland margins during a slightly more-mesic period. Bell points and bison remains were recovered from the Landslide site in Bell County (Sorrow et al. 1967). Bison disappeared, or were reduced in number, as more-xeric conditions returned during the later part of the Middle Archaic. Later Middle Archaic projectile point styles represent another shift in lithic technology (Collins 1995:384; Johnson and Goode 1994:27). Prewitt (personal communication 2000) postulates that the production and morphology of Travis and Nolan points are similar to those of projectile points from the Lower Pecos region. Such characteristics as beveled stems and overall morphology may have originated in the Lower Pecos, since these elements appeared earlier there than they did in central Texas. Shafer's (1963:67) surprise that Nolan points, which are more common in sites to the south and west, were not found in greater numbers at the Youngsport site might support the idea that bearers of these darts came out of the Lower Pecos and moved into adjacent portions of central Texas, but did not utilize all portions of central Texas equally. At the same time, a shift to more-xeric conditions accompanied the development of burned rock middens, the masses of burned rocks left over from multiple episodes of baking and cooking with hot rock hearths and ovens. Johnson and Goode (1994:26) believe that the dry conditions promoted the spread of xerophytic plants, such as yucca and sotol, which were collected and cooked in large rock ovens by late Middle Archaic peoples.

During the succeeding Late Archaic period (4000 to 1300–1200 B.P.), populations continued to increase (Prewitt 1985:217). Within stratified Archaic sites, such as Youngsport, the Baylor and Britton sites in McLennan County (Story and Shafer 1965), and the Steele site in Hill County (Stephenson 1970), the Late Archaic components contain the densest concentrations of cultural materials. The establishment of large cemeteries suggests strong territorial ties by certain groups (Story 1985:40). A variety of projectile point styles appeared throughout the Late Archaic period. Johnson and Goode (1994:29–35) divide the Late Archaic into two parts, Late Archaic I and Late Archaic II, based on increased population densities and perceived evidence of Eastern Woodland ceremonial rituals and religious ideological influences. Middle Archaic subsistence technology, including the development of burned rock middens, continued into the Late Archaic period. Collins (1995:384) states that, at the beginning of the Late Archaic period, the construction and use of burned rock middens reached its zenith and that their use declined during the latter half of the Late Archaic. However, there is mounting data that midden formation and use culminated much later and that this high level of use continued into the early Late Prehistoric period (Black et al. 1997:270–284; Kleinbach et al. 1995:795). A picture of prevalent burned rock midden development in the eastern part of the central Texas region after 2000 B.P. gradually is becoming clear. This scenario parallels the widely recognized occurrence of post-2000 B.P. middens in the western reaches of the Edwards Plateau (see Goode 1991). The use of rock hearths and ovens and subsequent development of burned rock middens appears to have been a major part of the subsistence strategy, as a decrease in the importance of hunting—inferred from the low ratios of projectile points to other tools in site assemblages—may have occurred (Prewitt 1981:74).

Late Prehistoric Period

The Late Prehistoric period (1300–1200 to 300 B.P.) was marked by the introduction of the bow and arrow and, later, ceramics into central Texas. Population densities appear to have dropped considerably from their Late Archaic peak (Prewitt 1985:217), but the reasons for this

remain obscure. Subsistence strategies did not differ greatly from the preceding period, although bison became an important economic resource during the later part of the Late Prehistoric period (Prewitt 1981:74). As noted above, the use of rock hearths and ovens for plant food processing (?) and the resulting development of burned rock middens continued throughout the Late Prehistoric period (Black et al. 1997; Kleinbach et al. 1995:795). Horticulture came into play very late in the region and was of minor importance to overall subsistence strategies (Collins 1995:385).

In central Texas, the Late Prehistoric period generally is associated with the Austin and Toyah phases (Jelks 1962; Prewitt 1981:82–84). Story (1990:364), in her overview of the middle Brazos River basin, argues for a period/horizon characterized by Alba points and Early Caddoan-like pottery intermediate between the Austin and Toyah phases. Evidence of this proposed archeological manifestation was found at the Chupik site in McLennan County (Watt 1953). Much of what we know about the Austin and Toyah phases comes from rockshelter sites in and around Whitney Lake in Bosque and Hill Counties (Jelks 1962; Stephenson 1970). Austin and Toyah phase horizon markers (Scallorn-Edwards and Perdiz arrow points, respectively) are distributed across most of the state. The introduction of Scallorn and Edwards arrow points into central Texas often is marked by evidence of violence and conflict, as many excavated burials contain these point tips in contexts indicating they were the cause of death (Prewitt 1981:83). Subsistence strategies and technologies (other than use of the bow and arrow) did not change much from the preceding Late Archaic. This continuity is recognized by Prewitt's (1981) use of the term "Neoarchaic." In fact, Johnson and Goode (1994:39–40) and Collins (1995:385) state that the break between the Late Archaic and the Late Prehistoric could be represented easily and appropriately by the break between the Austin and Toyah phases.

Around 1000–750 B.P., slightly more-xeric or drought-prone climatic conditions returned to the region and bison returned in large numbers (Huebner 1991; Toomey et al. 1993). Utilizing this vast resource, Toyah peoples were equipped with Perdiz point-tipped arrows, end scrapers, four-beveled-edge knives, and plain bone-tempered ceramics. The technology and subsistence strategies of the Toyah phase represent a completely different tradition than the preceding Austin phase. Contact with Caddoan groups to the east and northeast is represented by the presence of Caddoan ceramics in site assemblages, particularly in the eastern peripheral areas of central Texas (e.g., Stephenson 1970). Collins (1995:388) states that burned rock middens fell out of use, as bison hunting and group mobility obtained a level of importance not witnessed since Folsom times. While the importance of bison hunting and high group mobility can hardly be disputed, the cessation of burned rock midden development during the Toyah phase is tenuous. A recent examination of Toyah-age radiocarbon assays and assemblages by Black et al. (1997) suggests that their association with burned rock middens represents more than a "thin veneer" capping Archaic-age features. Black et al. (1997) claim that rock hearth and oven use resulting in the development of burned rock middens, while not as prevalent as in earlier periods, played a role in the adaptive strategies of Toyah peoples.

HISTORIC PERIOD

Native Americans

Historical accounts of Native Americans and their interactions throughout the region with the Spanish, the Republic of Mexico, the Texas Republic, and the United States are provided by Hester (1989), Jelks (1970), and Newcomb (1961). The beginning of the late seventeenth and early eighteenth centuries marked an era of more-permanent contact between Europeans and Native Americans as the Spanish moved northward out of Mexico to establish settlements and missions on their northern frontier. There is little available information on aboriginal groups and their ways of life except for the fragmentary data gathered by the Spanish missionaries. The inevitable and disastrous impacts to native social structures and economic systems by disease and hostile encounters with Europeans and intruding groups, such as the Apache, were already under way at this time. Historically, three groups occupied the Waco area: Wichita-speaking groups consisting of the Tawakoni, Waco, and Kichai; Caddoan tribes comprised of the Anadarko, Hasinai, and Kadohadacho; and the Tonkawa. The Apaches

and Comanches also were present, but later.

Athanase de Mézières's expedition along the Brazos River in the 1770s encountered two large Tawakoni villages along a stretch from present-day Waco to the vicinity of the Nolan River (Jelks 1970; Krieger 1996). Based on archeological evidence and historical documents, the Stansbury site near Whitney Lake was occupied by the Tawakoni in the 1770s to 1780s (Jelks 1970). By the mid-1830s, the site was occupied by the Caddoan-speaking Hasinai, but the village moved in 1846 approximately 10 miles up the Brazos near the locale that would become Fort Graham in 1849. Fort Graham was established to provide protection for the growing number of Euro-American settlements in the area from Native American hostilities. It was only briefly occupied by the United States military and was abandoned in 1853 (Jelks 1970). Tonkawa groups seeking protection from Comanche raids moved near there.

The Native American presence and hostilities precluded Euro-American settlement of the Waco area until the 1840s and 1850s despite its location within the 1825 Mexican colonization grant given to Robert Leftwich. In 1844 and 1845, formal talks between the Republic of Texas and Native American groups occurred, but settlement remained sparse as only 17 percent of the land area had been surveyed by 1845, and no permanent settlements were established until Texas was annexed by the United States (Prikryl and Jackson 1985:28–29; Smryl 1996a:431). The removal of Native American groups, first to a reservation in Texas in 1854 and then to Indian territory (Oklahoma) in 1859, opened the area to widespread settlement (Smryl 1996a:431).

Early Settlement

A history of the settlement and development of the Bosque River valley during the years 1700–1984 is provided by Jackson (1984) and Prikryl and Jackson (1985). More-complete histories of McLennan County and the Waco area are provided by Baker (1936), Kelly (1972), Poage (1981), and Horne (n.d.).

Under the governments of the Republic of Texas and the State of Texas, the location of surveys in the Waco area was carried out at a slow but regular pace. One of the first land grants on the North and Middle Bosque Rivers in the Waco Lake area was issued on April 26, 1832, to Thomas Jefferson Chambers, a surveyor and notorious land speculator (Smryl 1996a:431). Other surveyors in the north-central Texas region included George B. Erath and Neil McLennan, both of whom later returned and established residences on the land they had surveyed. Neil McLennan built a cabin and took up residency in 1845, and George B. Erath was one of the surveyors who helped lay out the townsite of Waco in 1849. When a new county was established on January 20, 1850, it was named McLennan in honor of the first permanent settler (Kelly 1972:174; Smryl 1996a:431).

Neil McLennan, a native of the Scottish Isle of Skye, immigrated with his extended family and a group of friends in 1801, first to North Carolina and then to Florida. They left Florida for Texas in 1834 and settled initially at Pond Creek in the Robertson Colony. In 1836, McLennan's brother (Laughlin), sister-in-law, and mother were killed by Indians, who also captured Laughlin's three children. The survivors moved to a safer location, but despite this effort, McLennan's other brother, John, was killed by Indians in 1838. It was after these tragedies that Neil McLennan joined George B. Erath in surveying the Waco area. In 1845, McLennan exchanged his land at Pond Creek for land in the Waco area and relocated his family. McLennan died in his family home in 1867 (Smryl 1996a:430). The Neil McLennan cabin survived until 1934 when it burned down. Its location was threatened by the expansion of Waco Lake in 1961, and when archeologists revisited the site in 1985, they found that extensive gravel mining had disturbed the area (Prikryl and Jackson 1985:30).

The home of Duncan McLennan, Neil's son, also was identified within the project area and designated as 41ML140. The site was reported by local informants to have been occupied by George B. Erath as well. Archival research confirms this association. By 1851, George B. Erath had established a 600-acre farm on the Farnash Survey where he had a house, 3 slaves, and 2 horses. By 1860, his operation had expanded to include 11 slaves, 19 horses, 740 cattle, and 260 sheep. In 1868 and 1869, Duncan McLennan bought this property from George B. Erath (Prikryl and Jackson 1985:30–31).

George Bernard Erath was a native of

Vienna, Austria, where he was educated. He immigrated to the New Orleans area in 1832 and left for the Robertson Colony in 1833. Although his initial ties were to Waco as a surveyor in 1849 and as a landowner through the late 1860s, the bulk of his notable career was spent elsewhere in other capacities, primarily military and political. Simultaneous with his service as a surveyor, Erath was a member of ranger companies in 1835 and the early 1840s, assembled in an effort to control Indian activities. In 1858, he was instrumental in organizing the Texas Ranger group under Captain John S. Ford, although Erath was not a member himself. Instead, in 1861 he became member of a committee that arbitrated disputes between the State of Texas and the Native Americans on reservations in the state. Other military duty consisted of service in the Texas Revolution (including participation in the Battle of San Jacinto) and the Civil War. Erath's ill health sent him home to Waco at the beginning of the war, but by 1864 he was in command of a regiment that defended his home region. Erath's other major activity was politics. He was a member of Congress during the Texas Republic, a member of the first state legislature, and a senator in 1857 to 1861 and again in 1874 (Cutrer 1996:880).

Another early settler in the Bosque valley was Israel Washington Speegle. Speegle was born in North Carolina in 1813 and moved from Missouri to Texas with his wife, Susanna, and family in 1849. Once in the Waco area, he started farming and set up shop as a blacksmith. In 1859, Speegle was a successful sheep farmer. The Speegle family also maintained peach and apple orchards. During the 1860s, wheat, corn, and oats were of principal importance to the needs of settlers in general and their livestock. Israel Speegle's blacksmithing shop served as a focal point for the community. As the community began to develop in the antebellum period, a store, the Speegleville Cemetery, and several churches already had been established (Speegle 1985). During the postbellum era, the area continued to develop into a small town. In 1879 Speegleville got its first post office, and Israel Speegle became its first postmaster. A cotton gin was built in 1885, which was the same year that Israel Speegle died (Buice 1985; Prikryl and Jackson 1985:34–38, 195; Smryl 1996b:24).

Civil War and Reconstruction

In January 1861, a representative from McLennan County voted for secession, and he was overwhelmingly supported by the population in the county. During the Civil War, 1,500 men (including 6 generals) from McLennan County joined in the struggle. Despite their effort, the cause was lost, and the City of Waco was occupied by U.S. troops for a short period during Reconstruction. Friction between troops and local residents was common (Smryl 1996a:431).

After the war, veterans returned to their homes and farms to resume their lives as best they could. However, during Reconstruction, McLennan County suffered a great economic decline, as did much of the South. The wealth once gained from agricultural production now was lost. A variety of factors contributed to this. The emancipation of slaves equated to a loss of both their labor and value to their former owners. This combined with a trend toward smaller farm size, as well as a devaluation of acreage and livestock. Without these valuable agricultural assets, tax revenues for McLennan County decreased sharply. An inadequate transportation infrastructure exacerbated the problem. Upon emancipation, a large number of formerly enslaved African Americans stayed in McLennan County. Some remained as laborers on plantations, some sought work in Waco, and some moved to their own farms and established communities. Over time, the African American population slowly grew (Smryl 1996a:432). For blacks and whites alike during Reconstruction, cash crop farming and sharecropping became a new way of life (Prikryl and Jackson 1985:34).

The isolated Sneed homestead is a good representative of typical Reconstruction settlement. It was identified during survey in 1984 and designated 41ML179 (Prikryl and Jackson 1985:38). Nicholas Sneed was born in Williamson County, Tennessee, in 1826. He was educated in Alabama and then returned to his home state to become a teacher (Lewis Publishing Co. 1893:788). Sneed moved to Texas in 1850 and continued to ply his trade as a teacher, first in Navarro County and then in Waco, where he established the town's first school in 1851. Sneed taught in Waco until 1853 but then returned to Navarro County until called away for

duty at the advent of the Civil War. Sneed was commissioned as a lieutenant and later promoted to captain. Although Nicholas Sneed survived the war, he returned to Texas not only as a veteran but also a widower. His wife had died while he was away (Prikryl and Jackson 1985:38–39).

By October 1865, Sneed had met and married Jennett Hubby, the widow of a Waco merchant. Upon her previous husband's death, Jennett had inherited 80 acres of land located on Hog Creek. In 1866, Sneed and his new wife moved to the property and established a farm. Jennett died shortly after, in 1868, but Nicholas continued to raise Jennett's children on the farm until 1877. In that year, the Sneed house burned down, and Nicholas sold the property and moved to a new location. The property was never reoccupied. Instead, it became grazing land as part of a large cattle operation owned by the McLennan family (Prikryl and Jackson 1985:230–231).

Agricultural Recovery and Success

The hardships experienced in the Waco Lake area during Reconstruction began to improve in the late 1870s. The primary factors causing change were the influx of capital from the north, the increase of immigration by Europeans, and improved access to transportation via the railroad. In the 1880s, five major rail lines were constructed in McLennan County. Waco became a primary junction and a large center of urban development (Smryl 1996a:432).

By the 1880s, horses and mules replaced sheep and oxen, and cotton was the primary cash crop. The average farm size in the Waco Lake area was 144 acres, but by 1900 the average had dropped to 89 acres for landowning farmers (Prikryl and Jackson 1985:39). Access to markets and railroad transportation allowed for a transition from subsistence farming to a single commercial cash crop. Farmers stopped growing subsistence crops and began to rely more heavily on goods supplied by the railroads. A nationwide distribution system allowed all farmers to concentrate on a single cash crop as opposed to growing a series of subsistence crops. During the years of 1918 and 1919, cotton prices soared and the Speegleville community's cotton gin provided an important source of revenue for the county. Cotton agriculture dominated the area until the advent of World War I brought diversification to the local economy.

World War I and Camp MacArthur

In 1917, the United States Army purchased land to the west of Waco near the edge of the Bosque valley and built a training camp for American efforts in World War I. Much of the area where the camp once existed is now residential neighborhoods of Waco. Camp MacArthur served to further stimulate the local economy and also caused a shift toward more urban development. Many of the military personnel who had been stationed at the camp during the war chose to remain in Waco, which in turn contributed to a continuation of economic growth. Industrial ventures became an increasingly important part of the economy alongside agriculture (Smryl 1996a:432).

The 1920s to the Present

For the small farmers of central Texas, the Great Depression was preceded by a severe drought in 1925. As a result, Speegleville cotton farmers suffered dramatic losses (Prikryl and Jackson 1985:45). Relatively few new buildings were constructed during these difficult economic times, and black cotton land that sold for $150 per acre in 1920 sold for $25–30 per acre during the 1930s (Poage 1981:117).

The construction of the Waco Lake dam in 1929 offered hope of economic recovery to impoverished farmers. Investors such as W. H. Forrester began buying lakeshore property in 1928 for residential and recreational developments (Prikryl and Jackson 1985:45). Further development of the Waco Lake area was halted with the expansion of the lake in 1962. The Corps of Engineers purchased most of the shoreline property and constructed a larger dam to allow for the impoundment of the additional water needed to supply the growing City of Waco. The Corps of Engineers removed, and in some cases relocated, any structures that were standing after purchasing the lakeshore property. The east side of the lake near the White Rock Escarpment consists mainly of Waco suburbs, while most of the western side has been developed by the Corps as camping, boating, and picnicking areas.

METHODS OF INVESTIGATION

3

FIELD METHODS

Formal testing of nine sites at Waco Lake consisted of re-locating each site, site reconnaissance, trenching (prehistoric sites only), manual excavation of test units, recordation of soil-stratigraphic profiles, and mapping. This was done over ca. 69 work days between October 2000 and February 2001, requiring 347 person-days of effort. Using information from previous investigations, each site was re-located, and the ground surface and cutbank exposures (where present and accessible) were examined for cultural materials. On the seven prehistoric sites, the general strategy for testing consisted of opening up two to six trenches within the site limits as recorded in 1984 (because the lake level was much lower in 1984, cutbanks and the cultural materials within them were more visible than in 2000–2001), followed by the placement of four to six test units (often in 1x2-m configurations) adjacent to and within the trenches to sample the cultural deposits. On the two historic sites, the strategy focused on using four to six test units to explore cultural features visible on the surface, as well as areas between and around features.

Trenching was conducted on prehistoric sites to provide exposures of soil stratigraphy, assess site geomorphology, and provide access to deeply buried deposits requiring manual excavation. The City of Waco's Water Utilities Department supplied the machinery needed for trenching (a standard backhoe, a small trackhoe, and a large trackhoe, depending on the anticipated depth of excavation at each site, soil conditions, accessibility, and machine availability) and a skilled operator. The 30 trenches excavated varied greatly in size and depth, with smaller trenches sufficing at the shallowly buried sites and larger trenches required at the sites with deeply buried deposits. The trenches ranged from 2.1 to 8.6 m in length, 1.0 to 4.0 m in width, and 0.6 to 4.5 m in depth (mean length = 4.8 m; mean width = 2.4 m; mean depth = 2.7 m). As with placement of the trenches, depth was determined to a large extent by what had been recorded in 1984, when good cutbank visibility allowed the depths of the cultural deposits to be determined. Thus, for each site, a target depth for trenching/test unit excavation was identified at the beginning of the project. Not surprisingly, actual testing results differed in some cases from the depth estimates derived from the 1984 data, resulting in the need for strategic adjustments at some sites (e.g., removal of sterile overburden without screening, deeper excavations than planned, etc.).

Backdirt from the trenches was not screened; however, it was examined cursorily for cultural materials. Trench excavations were monitored by the project archeologist or geomorphologist, and the trench walls were examined for the presence of cultural remains. When deeply buried cultural materials or features were encountered in a trench wall, a safety bench was excavated within the trench to serve as a working platform for deep manual excavations. The soil stratigraphy was described for representative trenches by the Project Geomorphologist. Soil-stratigraphic descriptions and the methods used are presented in Appendix A. When appropriate, diagnostic artifacts or special samples, such as charcoal or bulk sediment, were collected from the trenches. Each sample was assigned a unique alphanumeric designation based on the sample type (e.g., the first

charcoal sample was designated C1, the first sediment sample S1, etc.). All samples were numbered consecutively for each site and recorded on an Inventory of Samples Collected form.

Forty-two 1x1-m test units encompassing 65.5 m^3 of sediment (32 units and 60.2 m^3 at the seven prehistoric sites, and 10 units and 5.3 m^3 at the two historic sites) were excavated to sample buried cultural deposits. The locations of the units were determined by the findings of previous investigations, trenching results, evidence in cutbanks, and the locations of surface features (on the historic sites). Most units on prehistoric sites were along or within trenches, while the units on historic sites were unaccompanied by trenches. All units were excavated in arbitrary 10-cm levels, with the ground surface of the highest corner used as a datum for vertical control. In cases where test units were excavated on safety benches within trenches or where culturally sterile overburden was removed and not screened, the numbering of excavation levels began at the prepared surface. A datum point was placed at the highest corner of the test unit for vertical control, and the distance from the ground surface to the datum point was noted for the first level on the Excavation Level Record form.

Manually excavated fill was dry screened through ¼-inch-mesh hardware cloth. Artifacts were collected and bagged by level and noted on an Artifact Frequency Distribution Summary form. Charcoal recovered from the screen was collected by level and given a sample number. Materials such as mussel shell fragments, feature-associated burned rocks, snail shells (*Rabdotus* sp.), and intrusive modern debris were only counted (burned rocks also were weighed) and not collected. An Excavation Level Record form was completed for each level, and an inventory of artifact bags was maintained for every test unit. Selected test unit profiles were drawn in cases where features were present or unusual stratigraphy was observed.

Discrete cultural features typically were excavated as entities. Features were described and recorded on Feature Data forms, as well as photographed and mapped in plan and profile. If possible, charcoal samples were collected directly from the fill of prehistoric features. Often, a feature's entire matrix was collected as a flotation sample. Otherwise, the remaining matrix was screened through ¼-inch-mesh hardware cloth.

All sites were mapped using a Sokkia electronic total station. For each site, a datum marked by rebar or a wooden stake in the ground was established and assigned an arbitrary elevation of 100.00 m. Site maps included the natural topography, cultural features exposed on the surface, all mechanical and manual excavations, datum points, natural and manmade landmarks, and, in many cases, the edge of Waco Lake.

In addition to recordation using the forms mentioned above, the Project Archeologist maintained field records including a daily journal. Furthermore, the excavations were documented through photography. Black-and-white photographs and color slides were taken to document the investigations including site overviews, backhoe trench and test unit profiles, and cultural features.

ARTIFACT ANALYSIS METHODS

The cultural materials recovered during the testing are grouped into two broad categories—prehistoric and historic artifacts. Each category is subdivided into different artifact types and described below.

Prehistoric Artifacts

Chipped Stone Artifacts

Analysis of the chipped stone artifacts utilizes a technological and functional framework composed of seven classes of tools and artifacts: projectile points, bifaces, unifaces, cores, cobble tools, edge-modified flakes, and unmodified flakes. The methods of analysis for each class are discussed below, and descriptions of the materials and illustrated examples can be found in Chapter 4.

PROJECTILE POINTS

Projectile points are divided into arrow points and dart points. No preforms of either category were identified. Tool completeness and measurements are recorded for each specimen. The nine categories of tool completeness are intact or nearly complete specimens and proximal, medial, distal, stem, longitudinal, barb, wedge, and indeterminate edge fragments.

Measurable attributes, including maximum length, maximum blade width, neck width, base width, haft length, and overall thickness are recorded when possible. All measurements are in millimeters. Elton R. Prewitt, with reference to the type descriptions of Suhm and Jelks (1962) and Turner and Hester (1993), assigned all typological identifications.

BIFACES

Bifaces are categorized by their stage of reduction (early, middle, late, finished, or indeterminate), biface function or tool class, and tool completeness. Measurements of overall length, width, and thickness are given when possible.

Early stage reduction bifaces exhibit the nature of the raw material blank from which they were made (e.g., cortex, stream cobble, or tabular chert morphologies). The biface is in an initial stage of percussion shaping, exhibiting large, deep percussion flake scars, irregular cross sections, and irregular margins. Percussion thinning is not evident. Middle stage reduction bifaces show evidence of initial percussion thinning. The percussion flake scars are more evenly spaced and tend to run almost all the way across the surface of the biface. Margin regularizing is accomplished with fine percussion flaking, and platform preparation is more distinct and carefully executed. Late stage reduction bifaces have apparent final percussion thinning and margin regularizing. The percussion flake scars are well spaced. They overlap only slightly with contiguous flake removals, and they tend to terminate at the medial ridge of the biface, often with step or hinge fractures, which are met by similar flaking from the opposite edge. Evidence of careful platform preparation is present, with many of the platforms having been isolated, possibly by pressure flaking. A finished-stage biface exhibits careful, selective pressure flaking along the margins. The high ridges between the percussion flakes have been removed, producing a sharp and regular margin. The tool is carefully pressure thinned across both faces, and use wear is evident.

Bifaces may fall into seven tool classes: adze, drill, graver, gouge, knife, scraper, and indeterminate biface. Adzes are chopping or cutting implements that presumably were hafted to a handle. Drills are characterized by a long tapered bit, usually blunted or dulled at the tip. Gravers are small, carefully chipped tools with beaklike protrusions. Gouges, while similar in morphology to adzes, probably functioned as planing and shaving tools rather than chopping or cutting ones. Knives are thin, sharp-edged bifaces presumably used for cutting. Scrapers are described below in the uniface category.

UNIFACES

Unifaces are categorized as end scrapers, side scrapers, end/side scrapers, knives, gravers, adzes, gouges, spokeshaves, and indeterminate unifaces. Tool completeness also is noted. Many of these tool categories are mentioned above in the biface category; those remaining are described below. The presence or absence of cortex and measurements, including overall length, width, and thickness, are given for each specimen.

Scraping tools consist of end and side scrapers or a combination of both. End scrapers are trimmed to a steep convex bit at the end of the long axis. Side scrapers are trimmed on the lateral edges of the blank. The end/side scrapers show trimming on both the lateral and distal ends. Use-related microflaking appears on the dorsal sides of scrapers. Spokeshaves are specialized scraping tools with unifacially retouched notches or concavities along a unifacially worked tool edge.

CORES

Cores are classified according to the number and orientation of flake removal scars. Measurements for both cores and core fragments are overall length, width, and thickness.

COBBLE TOOLS

Cobble tools are cobbles that retain a cortex-covered surface opposite a working edge. They are grouped into wedges or choppers based primarily on size and presumed function. Wedges are smaller specimens with working edges that have relatively acute angles. Choppers are larger with working edges that are primarily blunt. Recorded attributes are tool completeness, the presence or absence of cortical backing, and overall thickness, length, and width.

EDGE-MODIFIED FLAKES

Flakes with consistent unifacial and/or bifacial microflake scars, as opposed to items with intentional retouching or postdepositional alterations, are classified as edge-modified flakes. Edge-modified debitage attributes are flake type, dorsal cortex percentage, maximum dimension, and number of modified edges. The different flake types are: complete flakes, which have striking platforms and hinged or feathered terminations; proximal fragments, which have striking platforms but lack hinged or feathered terminations; chips, consisting of only medial or distal fragments without striking platforms; and chunks, angular debris that lacks flake attributes altogether. Evidence of burning or crazing, such as potlids or discoloring, also is noted.

UNMODIFIED DEBITAGE

Unmodified debitage is classified into the same types as edge-modified flakes. Similarly, the percentage of cortex present and maximum dimension are recorded. Evidence of burning or crazing also is noted.

Other Tools and Materials

Other tools and materials recovered from the prehistoric sites are burned rocks; pottery; ground, pecked, and battered stone tools; burned clay lumps; and floral and faunal remains. Burned rocks from feature contexts, which were not collected, were counted and weighed in the field.

Recorded pottery sherd attributes are vessel part, temper, interior and exterior surface finish, decorative technique and element or design, maximum dimension, and wall thickness. Ground, pecked, and battered stone tools are examined in terms of raw material, general shape, wear type and location, and the length and width of the working surface. Measurements recorded are weight, maximum length, width, and thickness. Burned clay lumps were counted and weighed.

Faunal remains consist of freshwater mussels and vertebrates. Freshwater mussels are identified by taxon, counted, and presented by provenience in Appendix B. Vertebrate faunal materials, also counted and identified by taxon, are presented in Appendix C. Flotation samples taken in the field yielded little in terms of botanical materials. A few larger pieces of charred wood are large enough for taxonomic identification.

Historic Artifacts

All historic materials were sorted to determine which artifacts have interpretive value, and those that could provide information relevant to temporal and/or functional questions were selected for detailed analysis. As many artifacts were identified as possible, although some have insufficient diagnostic attributes to allow for functional identifications. In such cases, material type identifications are utilized. All artifacts are quantified by count. The major artifact categories are ceramics, glass, metal, faunal, and other.

Ceramics

In general, ceramic as a material is extremely durable and survives well in archeological contexts. Therefore, diagnostic attributes that allow for dating usually are present. Also, there are copious published comparative data on ceramics of all sorts, making them that much more useful during analysis.

All sherds are identified by ware/paste type, glaze type, and decoration. These diagnostic characteristics determine classification within recognized ware types, including whiteware, stoneware, and bone china (Majewski and O'Brien 1987). Particular attention is paid to sherds with temporally diagnostic features. A primary focus is placed on whiteware sherds decorated with transfer-printed patterns, which can indicate a manufacturer, date range, and origin. An attempt is made to identify all transfer-printed patterns with reference to published volumes (Blake and Freeman 1998; Pollan et al. 1996; Williams and Weber 1998). However, some patterns cannot be identified.

Glass

Glass also survives well in archeological contexts. All glass is sorted to distinguish between container glass, table glass, window glass, and other glass. All glass also is classed by color, which can sometimes aid in indicating function

(such as milk glass jar lid liners) and age (such as nineteenth-century olive green glass or turn-of-the-century solarized glass). Table glass was exposed to black light under an ultraviolet lamp to test for fluorescence. An ice-blue fluorescence in colorless glass indicates it is lead glass, which is mid-nineteenth century in date.

Metal

A variety of artifacts found on historic archeological sites are made from metal, primarily ferrous and white metals. Ferrous (and other) metal is a somewhat problematic material. Because of rust and corrosion, it does not survive as well as ceramics and glass in archeological contexts, and diagnostic attributes often are lost. Metal also continues to degrade over time. Metal that is highly fragmented or unidentifiable due to rust has little interpretive value, and such items were not considered worthy of close examination. Objects classed in the metal category consist primarily of cut and wire nails and food containers, such as tin food cans.

RESULTS OF TEST EXCAVATIONS

4

This chapter presents the results of testing of nine archeological sites at Waco Lake. The locations of the nine sites are shown in Figure 4.

Site 41ML135

Description

Site 41ML135 contains both prehistoric and historic components. The site is on the eastern shore of Waco Lake opposite where Hog Creek enters the lake (see Figure 4). It is situated on a Holocene alluvial terrace at ca. 455–470 ft above mean sea level. This terrace was developed, at least in part, by the South Bosque River or perhaps the intermittent stream that bordered the site on the south prior to impoundment of the lake (this stream now forms an inlet of the lake). The eastern part of the site where the historic component is located extends above 470 ft and may consist of colluvial deposits from the steep slopes to the east. Prior to impoundment, a meander loop of the river lay just south-southwest of the site, with the floodplain lying at an elevation of ca. 440 ft. A reed-covered cutbank ranging from 1 to 2 m in height is located to the west and east of the site. Vegetation consists primarily of willows and buttonbushes along the shoreline and a dense forest of oaks, elms, hackberries, and mesquites upslope on the terrace surface.

Previous Investigations

Site 41ML135 was recorded in 1984 (Prikryl and Jackson 1985:70–75, 169–170). The investigations included surface survey and testing. The prehistoric component was recognized based on 10–15 flakes found over a distance of ca. 75 m along the shore. The materials appeared to have eroded out of the upper meter of the cutbank. Surface inspection yielded a comparable number of flakes and several burned rocks. These items were scattered throughout an area measuring 150 m northwest-southeast by 80 m northeast-southwest in the western part of the site. The historic component was evidenced by a scatter of glass, ceramics, and metal in an area measuring 100x50 m at the southeastern end of the site next to the upland slope. Purple glass and patinated olive glass, possibly indicative of a late-nineteenth- or early-twentieth-century occupation, were noted, in addition to a scatter of bricks and shaped limestone slabs that could indicate a house location.

Testing consisted of the excavation of three shovel tests, one 1x1-m unit, and two profile cuts. Shovel Test 1 was at the northwestern edge of the site 30 m north of the cutbank. No cultural materials were recovered from this unit, which was excavated to 75 cm. Shovel Test 2 was 18 m north of the cutbank and 50 m east-southeast of Shovel Test 1. Excavated in 15-cm levels to 60 cm, this unit produced two pieces of lithic debitage from Level 1 (0–15 cm) and one chert chip from Level 3 (30–45 cm). The second and fourth levels produced no cultural materials. Shovel Test 3 was 5 m north of the cutbank and 70 m southeast of Shovel Test 2 at the southeastern end of the site. Artifacts recovered from Level 1 (0–15 cm) consisted of one chert biface fragment, a bottle cap, and two glass fragments. One metal fragment was found in the third level (30–45 cm), and the fourth level (45–60 cm) yielded two glass fragments. The second level (15–30 cm) produced no cultural materials.

A 1.0-m-wide by 0.9-m-high profile cut was excavated on the cutbank directly south of

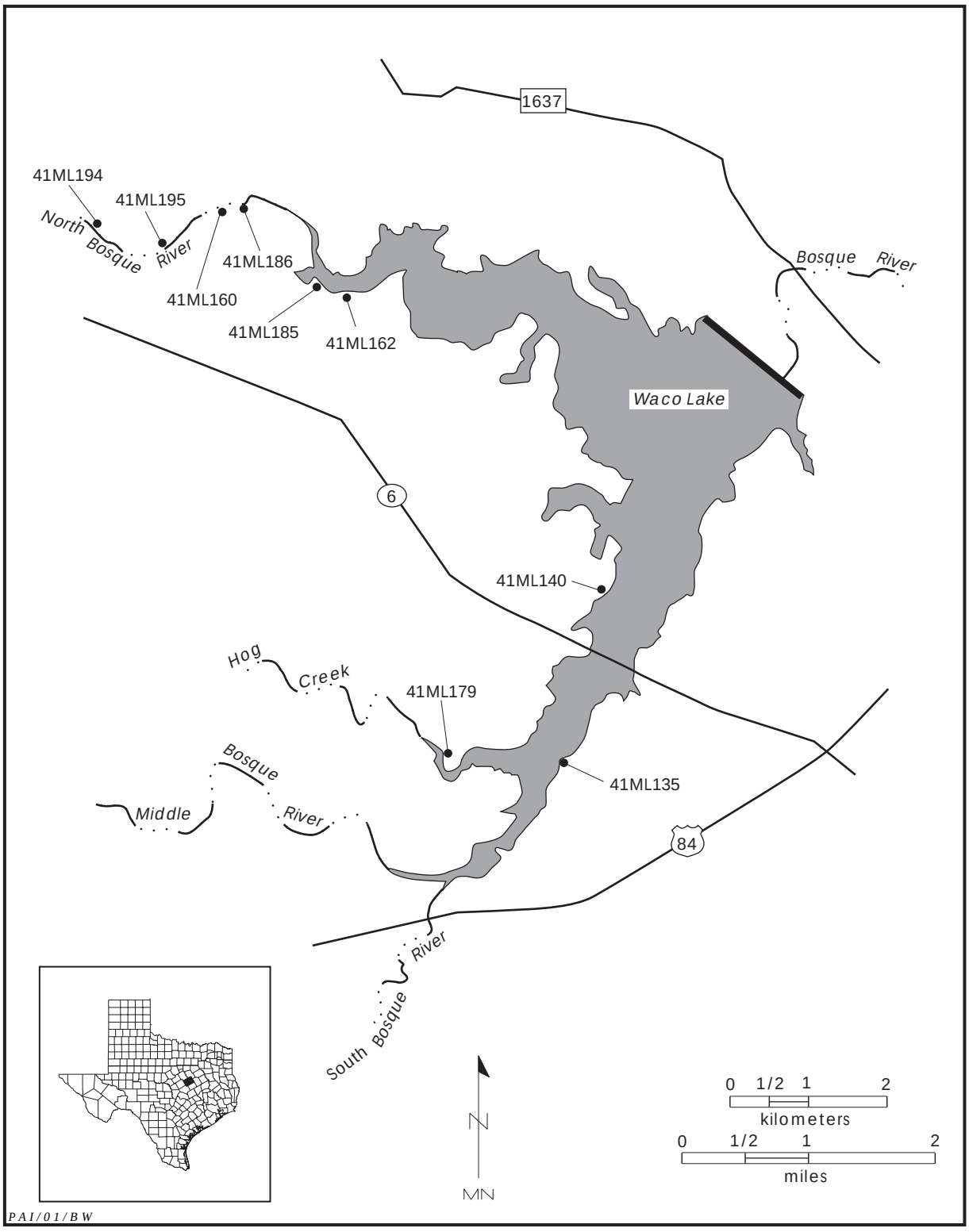

Figure 4. Locations of investigated sites.

Shovel Test 1. Two chert flakes were observed in the profile at approximately 2 and 50 cm below the surface, A second profile cut, 1 m high, was excavated south of Shovel Test 2. Except for a flake observed on the surface, this cut yielded no cultural materials.

A 1x1-m test unit was placed just east of Shovel Test 2 and excavated in 10-cm levels to a depth of 30 cm. This unit was intended to explore the possibility that the absence of artifacts in Level 2 of Shovel Test 2 indicated a separation of components evidenced in Levels 1 and 3. The first level of the test pit yielded a Perdiz point, 8 pieces of chert debitage, and 15 burned rocks. The second level produced 2 pieces of chert debitage, and the third level contained only 1 chert chip and several burned rock fragments. The profile cuts, shovel tests, and test unit all exposed similar profiles.

Site 41ML135 was revisited, surveyed, and shovel tested in 1999 as part of a site re-location and reassessment effort (Kvernes et al. 2000:34–36). Inspection of the site revealed that recent flooding had deposited substantial debris. Therefore, surface visibility was poor. The lake level was higher in 1999 than in 1984 making the cutbank unobservable. A 250x100-m area was surveyed for the identification of both prehistoric and historic artifacts. The scattered bricks and limestone slabs possibly representing the housesite were rediscovered, but no specific identification of the structural design or elements could be ascertained. Because of the abundant flood debris obscuring the ground, survey of the prehistoric component involved shovel testing. Two shovel tests were excavated to 40 cm, and neither produced any artifacts.

Work Accomplished

The 2000–2001 investigations focused on the prehistoric component, as the historic component is in the upslope part of the site and will not be affected by the proposed raising of the lake. A datum nail was set in the base of a bois d'arc tree located in the north-central part of the site. It represents the primary datum and was given an arbitrary elevation of 100.00 m. A secondary rebar datum was placed ca. 7 m northeast of the primary datum.

Five trackhoe trenches were excavated (Figure 5). None was deeper than 1 m. They were ca. 1 m wide and 2.5–3.5 m long. No cultural materials or features were observed in any of the trenches.

Trench 1 was excavated in the eastern part of the site at an orientation of 72°. Trench 2 was oriented at 344° and situated 66 m northwest of Trench 1. Trench 3 was excavated 19 m due north of Trench 2 and aligned at 356°. Trench 4, oriented at 22°, tested the western part of the site. It was located 36 m southwest of Trench 3. Trench 5, aligned at 340°, was located 20 m northeast of Trench 2 and 53 m northwest of Trench 1. Trench 5, along with Trenches 2 and 3, tested the central part of the site.

Four test units were excavated. All were placed adjacent to trenches, and Level 1 in each of the units began at the modern ground surface. All of the units were terminated at 60 cm. Test Unit 1 was on the south side of Trench 1. Test Units 2 and 3 were arranged on the east sides of Trenches 2 and 3, respectively. Test Unit 4 was on the west side of Trench 4. In total, 2.4 m^3 were hand excavated.

Site Extent and Depth

Based on the 1984 observations, the prehistoric component covers ca. 12,000 m^2. Waco Lake borders this component to the south and west. Cultural materials were encountered in each of the four test units to a depth of 60 cm. However, at 50 cm, artifacts decreased in number, while gravels increased. The cultural zone appears to be about 40 cm thick with a few artifacts being displaced deeper from bioturbation. The first level (0–10 cm) in each unit encountered modern and possible historic materials (e.g., wire nails, container glass, flat glass, a metal belt buckle, whiteware, wire, a button, a shell casing, a metal bottle cap, and plastic); however, in Test Unit 1 in the eastern portion of the site, the recovery of historic materials continued into Level 3 (20–30 cm). These materials were not collected because they are nondiagnostic and because they reflect, at least in part, modern debris deposited around the margin of the lake. Test Unit 4, located on the point to the west, produced the highest recovery of prehistoric cultural materials (n = 31).

Sediments and Stratigraphy

The sediments and stratigraphy at 41ML135

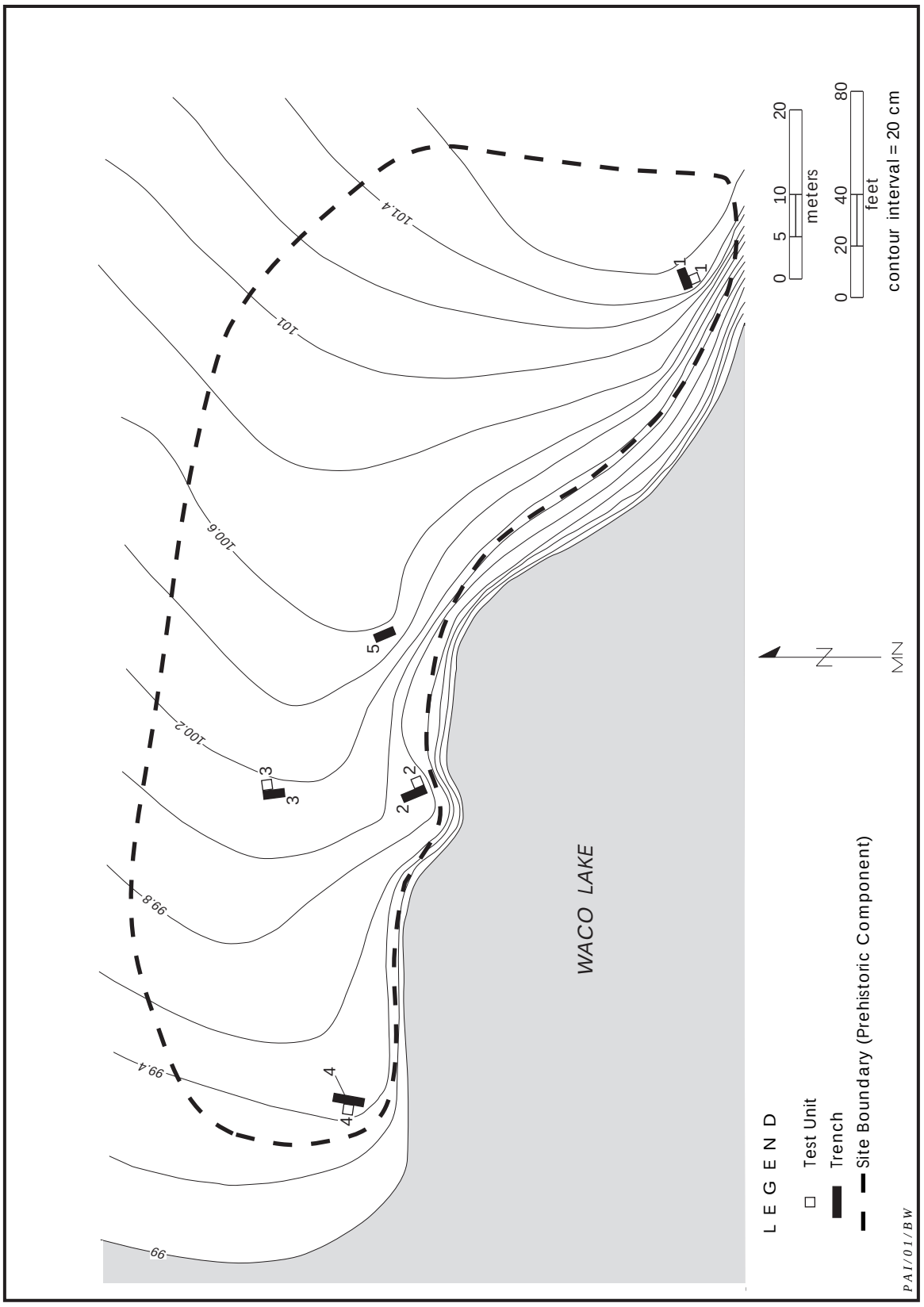

Figure 5. Map of 41ML135.

were examined through the profiles of five trenches and descriptions of the soil stratigraphy of two of the trench profiles (see Appendix A). The site is situated on an alluvial terrace, which (prior to inundation) stood ca. 9 m above the South Bosque channel. Soils on the terrace surface are mapped as part of the Catalpa series, which consist of dark grayish brown silty clay or clay soils formed on recent alluvium (Templin et al. 1958).

The alluvial deposits of Trench 1 are imprinted with an A-Bw soil profile. The A horizon (0–29 cm) is a dark grayish brown clay loam with 1 percent limestone gravels. The Bw horizon (29–81+ cm) is a light olive brown silty clay loam with 2 percent limestone gravels. The profile of Trench 4 is similar. It exhibits an A-Bw soil profile. The A horizon is a very dark gray clay with 1 percent limestone gravels, while the Bw horizon is a dark grayish brown silty clay loam with 10 percent limestone gravels.

The shallow trenches did not afford a look at the deeper deposits at 41ML135, but Collins and Holliday (1985:34) noted the presence of gravel beds and stringers interbedded with finer clastic sediments underlying the surficial deposits within a high cutbank exposure at the site. At the time, Collins and Holliday (1985:35) were uncertain of the age of these gravels, as data from other localities suggested that fine-grained sediments predominate the Holocene alluvium in the lower Bosque basin. However, based on the recovery of a Perdiz point by Prikryl and Jackson (1985) and the degree of soil development observed in Trenches 1 and 4, it is clear that the alluvial deposits (at least the upper ca. 1 m) composing the terrace are late Holocene in age. The underlying gravel beds and stringers are probably the source of the matrix-supported, subrounded to rounded gravels observed throughout the trench profiles during the current investigations. Their dispersal throughout the surficial fine-grained deposits is probably the result of biological agents.

Materials Recovered

The materials recovered from 41ML135 consist of 57 chipped stone artifacts, 4 vertebrate faunal specimens, and 2 invertebrate faunal remains. Also recovered were a few burned rocks. None of the test units encountered any cultural features.

CHIPPED STONE ARTIFACTS

A total of 57 chipped stone artifacts were recovered (Table 1). This assemblage consists of 1 biface, 1 core, and 55 pieces of unmodified debitage.

Table 1. Summary of chipped stone artifacts from 41ML135

Provenience	Biface	Core	Unmodified Debitage	Totals
TEST UNIT 1				
Level 1 (0–10 cm)	–	–	1	1
Level 2 (10–20 cm)	–	–	3	3
Level 4 (30–40 cm)	1	–	1	2
Level 6 (50–60 cm)	–	–	1	1
Subtotals	1	0	6	7
TEST UNIT 2				
Level 2 (10–20 cm)	–	–	2	2
Level 3 (20–30 cm)	–	–	1	1
Level 6 (50–60 cm)	–	–	1	1
Subtotals	0	0	4	4
TEST UNIT 3				
Level 1 (0–10 cm)	–	–	2	2
Level 2 (10–20 cm)	–	–	2	2
Level 3 (20–30 cm)	–	–	2	2
Level 4 (30–40 cm)	–	–	4	4
Level 5 (40–50 cm)	–	–	2	2
Level 6 (50–60 cm)	–	–	3	3
Subtotals	0	0	15	15
TEST UNIT 4				
Level 1 (0–10 cm)	–	–	20	20
Level 2 (10–20 cm)	–	1	3	4
Level 3 (20–30 cm)	–	–	6	6
Level 6 (50–60 cm)	–	–	1	1
Subtotals	0	1	30	31
TOTALS	1	1	55	57

Biface

A single longitudinal fragment of a biface was recovered from Test Unit 1. The fragment is in the late stage of reduction. It is 4.1 mm thick.

Core

A core was recovered from Test Unit 4. With most of the cortex remaining, only four bidirectional flake scars are present on the chert specimen. The core measures 65.8 mm long by 71.1 mm wide by 37.8 mm thick.

Unmodified Debitage

Fifty-five pieces of unmodified debitage were collected. Of those, 44 percent (n = 24) are complete flakes, 18 percent (n = 10) are proximal flakes, 22 percent (n = 12) are chips, and 16 percent (n = 9) are chunks. Cortex is present on 4 of the chunks and 20 flakes. Most of the flakes are small with 74 percent (n = 41) being 2 cm or less in maximum dimension. Most of these small flakes also lack cortex. Only 1 large complete flake (with cortex), measuring 4–5 cm in maximum dimension, was recovered. None of the flakes appear to have been utilized as expedient tools. Chert colors vary from a dark and/or mottled gray to a brown or mottled tan. A few specimens are light gray or almost white in color.

VERTEBRATE FAUNAL REMAINS

Vertebrate faunal remains are few and recovered from Test Unit 4, Level 1. The four specimens were identified as unburned, large to medium-sized Mammalia (see Appendix C). It is unclear whether the specimens are historic or prehistoric in age.

INVERTEBRATE FAUNAL REMAINS

Invertebrate faunal remains consist of two small fragments of unidentifiable freshwater mussel shells (see Appendix B). These two fragments are from Test Unit 4, Level 1.

OTHER MATERIALS

About 20–25 small (<5 cm) burned limestone rocks were observed. These occurred in all four test units; no concentrations indicative of features were found.

Chronology and Components

Stratigraphically separable cultural zones or components were not observed at 41ML135. Although a Perdiz point, suggesting a Toyah phase component, had been recovered during previous investigations (Prikryl and Jackson 1985:74–75), no other diagnostics were discovered during the current investigations to strengthen that assessment.

Summary and Assessment

While a Toyah phase component apparently is present at 41ML135, it appears to have little capacity to contribute important information. This is based on the overall sparseness of cultural materials, the lack of diagnostic artifacts or datable materials in the 2000–2001 excavations that would allow confirmation of the Toyah age assessment, the apparent lack of cultural features, and the lack (or extreme sparseness) of materials such as faunal and macrobotanical remains. It is recommended that the prehistoric component at 41ML135 be considered ineligible for listing in the National Register of Historic Places.

Site 41ML140

Description

Site 41ML140 consists of the remains of a housesite once occupied by George Erath and Duncan McLennan. Situated at an elevation of 465 ft on a high, old alluvial terrace on the west side of the South Bosque River valley (see Figure 4), the site is approximately 60 m northwest of the shore of Waco Lake. It is in a heavily wooded area adjacent to a previously cultivated field. The entire area resides in the Corps of Engineers Speegleville Park. Hackberries, chinaberries, elms, oaks, mesquites, and various tall grasses and weeds are present in and around the site.

Previous Investigations

The initial investigations at 41ML140 in

1984 included survey, limited testing, and archival research (Prikryl and Jackson 1985:175–178). Structural remains and scattered historic artifacts were noted over an area measuring 65 m north-south by 35 m east-west. The housesite was recorded in the center of this area. Two large mounds of bricks and sandstone rubble were thought to represent two chimneys at the ends of the house. Halfway between the rubble mounds were two sandstone and brick footings interpreted as chimney foundations for an earlier house. Artifacts collected from the surface included ceramics (alkaline-glazed stoneware, flow blue whiteware, blue shell edge, blue transfer-printed ware, ironstone, decalcomania, porcelain, and molded blue stoneware); perfume, olive oil, and patent medicine bottles; ornamental pressed glass sherds; and miscellaneous metal artifacts such as buttons, a spoon, and cut nails.

A single shovel test was excavated to a depth of 15 cm and produced cut nails, window and bottle glass, a shell button, a metal fragment, and several burned bone fragments from 0 to 10 cm. These artifacts and those recovered from the surface indicated mid-nineteenth- to early-twentieth-century occupations (Prikryl and Jackson 1985:176).

Additional investigations included archival research. McLennan County deed and tax records indicated that the site represents the former homes of McLennan and Erath. George Erath established a large plantation around 1850–1851 and then sold it to Duncan McLennan in 1868. Nannie Sinclair purchased the property from Duncan McLennan in 1930, but tax records indicate that she probably never occupied the property (Prikryl and Jackson 1985:177). She sold it to the Corps of Engineers in 1962. The only improvements listed for the property at the time it was acquired by the Corps were an abandoned building and a barn.

Site 41ML140 was revisited in 1999 as part of a site re-location and reassessment effort (Kvernes et al. 2000:36–38). Investigations consisted of re-locating the features, surface inspection, and shovel testing. Features at the site were examined to determine if any disturbances had occurred since their recording in 1984. They were found to be in similar conditions as originally reported. Four shovel tests were excavated. Each one was placed near a feature. Feature 1 (the brick-lined well/cistern) was cleared and found to be filled with earth and rubble. No shovel tests were excavated in the well. However, Shovel Test 99-1 was dug near Features 2 and 3. A single piece of clear glass was recovered from 20 to 40 cm. Shovel Test 99-2 was excavated in the vicinity of Feature 4 and yielded three pieces of container glass, a burned button, and tin can fragments in the upper 20 cm. From 20 to 40 cm, a whiteware sherd and a charcoal fragment were recovered. Shovel Test 99-3 was excavated adjacent to Feature 5 and yielded one clear glass fragment from 20 to 40 cm. Finally, Shovel Test 99-4 was placed east of Feature 6 and recovered two glass sherds. The two remaining features at the site are a twentieth-century privy foundation and a metal water tank with associated foundation. No shovel tests were excavated near them. Most of the artifacts observed on the surface in 1999 or recovered from shovel tests were found to date to the late nineteenth or early twentieth centuries. A few mid-nineteenth-century artifacts were observed on the surface. They included handmade bricks, blown-glass tableware, and a rim sherd from an undecorated ironstone chamber pot.

Work Accomplished

During the 2000–2001 investigations, a long rebar stake was used as the primary datum and was given an arbitrary elevation of 100.00 m. The datum was placed ca. 22 m east of the edge of the woods and ca. 8 m southwest of Feature 1, the well/cistern. A second datum (rebar) was placed near a large oak tree in the northern area of the site, ca. 14 m south of the edge of the woods and ca. 18 m almost due north of Feature 1.

After initial identification of the various features, each feature was swept to remove leaf debris and then photographed, drawn in plan view, and subjected to testing. Four auger tests were excavated in Feature 1, while one test unit each was excavated in Features 2, 3, 4, and 6 (Figure 6). Two test units were placed in Feature 5.

Four auger tests were dug in Feature 1. Auger Tests 1 and 2 reached 40 and 45 cm, while Auger Tests 3 and 4 terminated at 60 and 75 cm, respectively. Each auger test was stopped by a blockage of bricks.

Test Unit 1 was on the east edge of Feature 5.

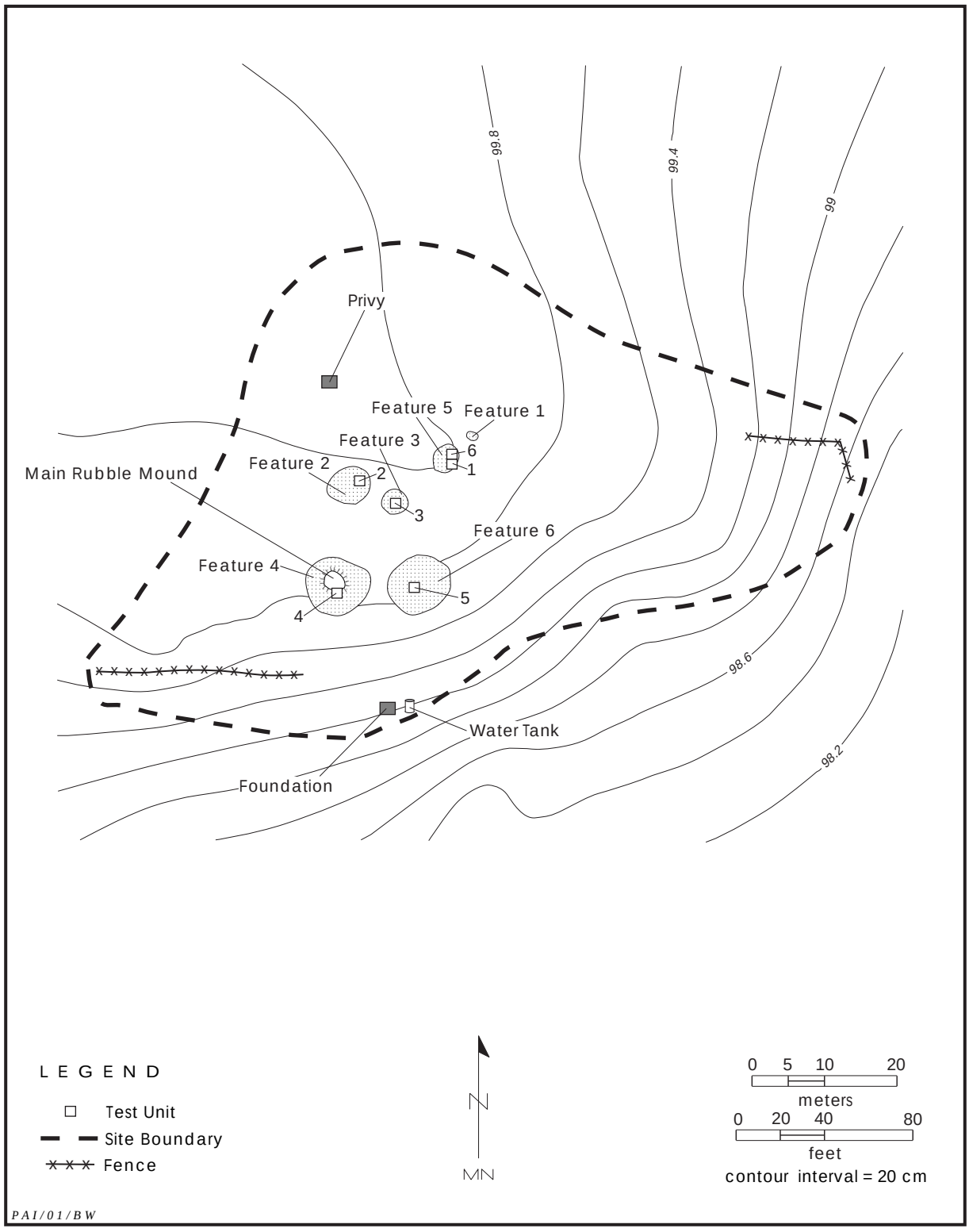

Figure 6. Map of 41ML140.

Excavation was terminated at Level 8. Test Unit 2 was on the east side of Feature 2, hitting one of the large rocks to the north. Excavation was completed at Level 4. Test Unit 3 was situated adjacent to a large flat rock on the western side of Feature 3. Level 4 also was the last level excavated in this test unit. Located on the southern slope of the large pile of rubble designated as Feature 4, Test Unit 4 was excavated to Level 9. The first few levels were smaller than 1x1 m because of the sloping nature of the rubble mound. Test Unit 5 was near the southern center of the brick rubble pile of Feature 6. Work was completed in this unit at Level 4. Finally, Test Unit 6 was placed adjacent (north) to Test Unit 1 in Feature 5 to follow out a gray ashy lens found in the first unit. As with Test Unit 1, Test Unit 6 was finished at Level 8. A total of 3.4 m^3 was excavated at 41ML140.

Site Extent and Depth

Based on the features and artifacts visible on the surface, 41ML140 covers ca. 6,300 m^2. The features indicate that the surface of the landform at the time of occupation approximated the current surface, although all of the investigated features and substantial artifact deposits extend below the modern surface within a ca. 20–40-cm-thick matrix of dark brown silty clay loam over sterile reddish brown clay to clay loam. Sixty-eight percent of the 1,950 artifacts from the test pits are from the upper 20 cm. Almost all of the remainder are from 20 to 60 cm, with most coming from the subsurface component of Feature 5 in Test Units 1 and 6. Artifact yields varied significantly. The units with the highest yields are Test Unit 5 (n = 669), Test Unit 1 (n = 498), and Test Unit 6 (n = 438).

Cultural Features

Eight features were documented at 41ML140 (see Figure 6). Six are assigned number designations, while two relatively recent features are not.

FEATURE 1

Feature 1, located northeast of the house, is a brick-lined cistern (or possibly a well) filled with earth and rubble (Figure 7). It measures 1.0x0.7 m and has been damaged on the northern side by the growth of a tree. Surface manifestations of the feature consist of the lining of machine-made bricks, most of which have a mortar veneer covering them. The center of the circular opening is filled with sediment. Artifacts observed around the feature include a condensed milk can, modern beer bottles, sanitary cans, and metal roofing.

Four 15-cm-diameter auger tests were dug in the sediment-filled opening. The sediments were not screened, and none of the artifacts recovered were collected. Each test was terminated after encountering tightly packed bricks. Auger Test 1 stopped at 40 cm and recovered a plastic soda bottle label, a piece of glass, a stoneware sherd, and an earthenware sherd. Auger Test 2, dug to 45 cm, recovered another piece of the plastic label, two mortar fragments, charcoal and brick fragments, and a wire nail. Excavated to 60 cm, Auger Test 3 encountered numerous charcoal flecks and brick fragments. Auger Test 4, terminated at 75 cm, recovered more of the plastic label, charcoal flecks, brick fragments, a wire nail, a fragment of rusted sheet metal, and a stoneware sherd. None of the materials appear to be early in age, and it is unclear if the feature contains cultural deposits beneath the brick fill. Based on the presence of machine-made brick, it appears that Feature 1 is not associated with the initial Erath occupation of 41ML140, unless the visible portion represents repairs to an early cistern/well.

FEATURE 2

Located in the western part of the site, Feature 2 consists of large, flat, cut sandstone blocks in an L-shaped configuration around which numerous other sandstone and machine-made brick fragments are scattered (Figure 8). The scatter measures about 3.5 m north-south by 4.0 m east-west. Artifacts observed on the surface include container glass, window glass, milk glass, porcelain, and sheet metal fragments. Test Unit 2 was placed in the eastern portion of the feature. Excavations revealed that the large tabular stones continue 38 cm below the surface, consisting of three more courses of tabular stones averaging ca. 15 cm in thickness (Figure 9). Artifacts recovered during excavation consist of animal bones, a ceramic sherd, a

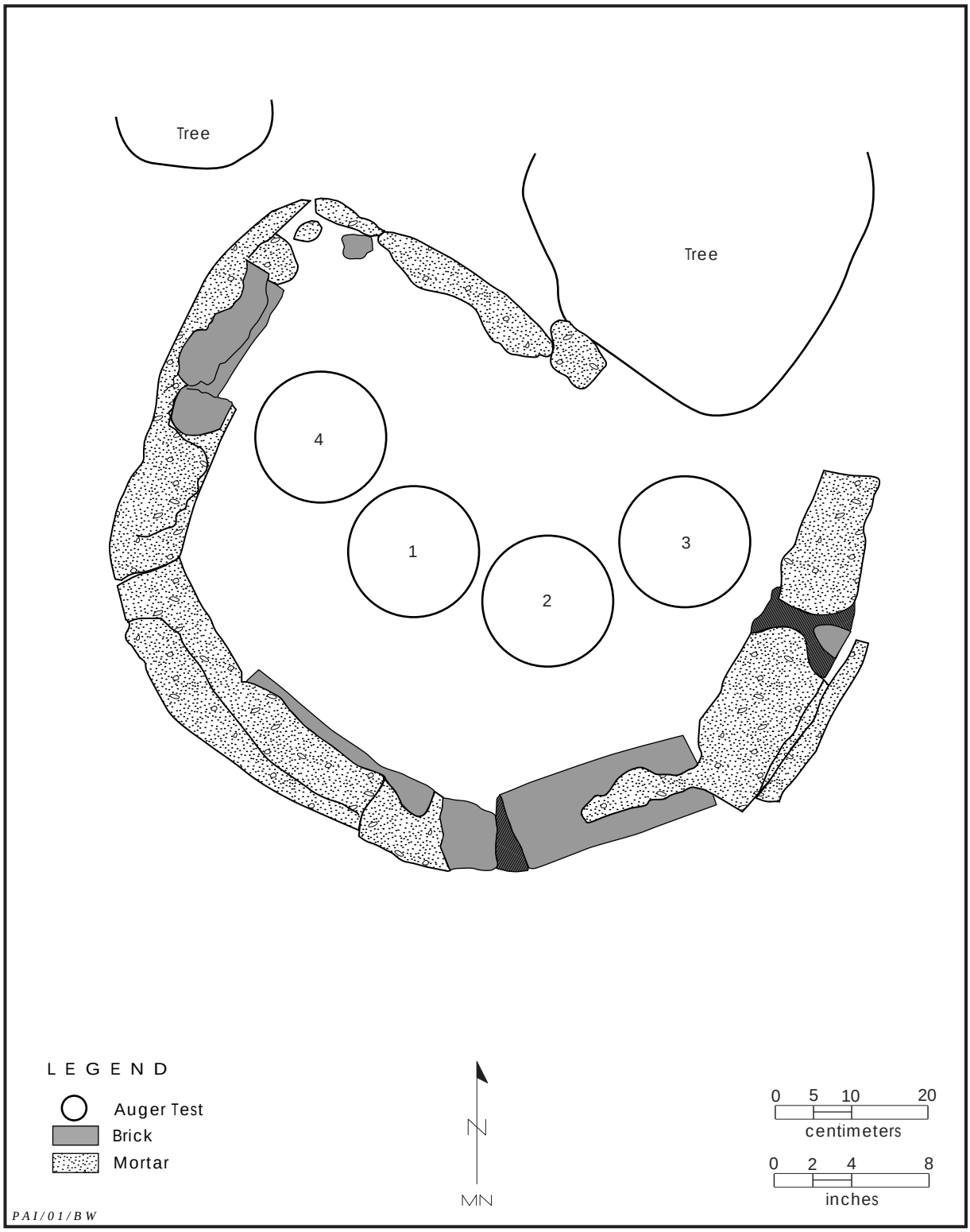

Figure 7. Plan view of Feature 1 at the Erath/McLennan House, 41ML140.

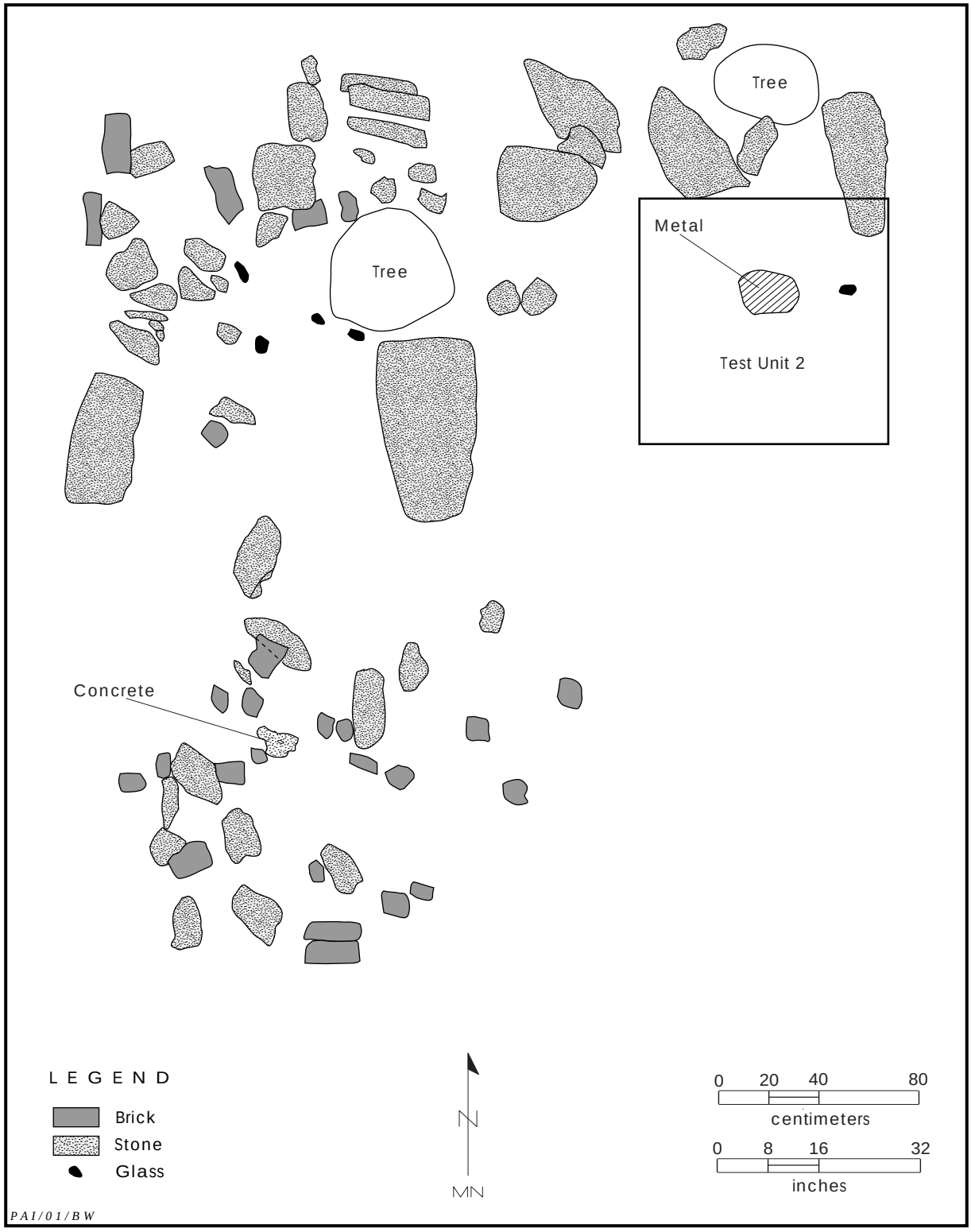

Figure 8. Plan view of Feature 2 at the Erath/McLennan House, 41ML140.

Figure 9. Photograph of Feature 2 as exposed in Test Unit 2 (Level 2) at the Erath/McLennan House, 41ML140. View to the east.

small bottle, and glass fragments. Feature 2 appears to be a partially intact foundation. While no evidence of a pit could be seen in the walls of Test Unit 2, the subsurface extent of the rocks indicates that the foundation was placed in a builder's trench. Although no ash or charcoal was recovered, it is suspected that the foundation was for a chimney based on its size and shape.

FEATURE 3

Feature 3, which lies ca. 3 m southeast of Feature 2, is another configuration of tabular sandstone rocks (Figure 10). It measures ca. 2.6 m north-south by 2.5 m east-west. The large rocks are arranged in a U-shaped pattern. Scattered around them are smaller fragments of sandstone, concrete, and machine-made bricks. Other artifacts observed on the surface include melted clear glass, a metal table knife, corrugated metal roofing, and a fragment of metal chain. Test Unit 3 was placed at the southern end of the feature to include the westernmost large rock. Excavations revealed that this rock is not underlain by others, unlike Feature 2. Cultural materials were recovered from the first three levels (0–30 cm); they consist of nails, ceramics, glass, a canning jar lid liner, bones, teeth, numerous charcoal fragments, and a 1-inch-diameter pipe traversing the unit, which indicates disturbance. Based on the degree of disturbance (especially the underlying water pipe) and the fact that the rocks apparently are resting on the modern ground surface, Feature 3 appears to represent materials displaced from Feature 2 nearby, or perhaps footing stones for the house. In either case, it has little integrity.

FEATURE 4

Feature 4, located in the southwest part of the site, is a large pile of sandstone rocks, bricks, and concrete fragments. The rubble pile covers about 6 m north-south by 7 m east-west and is about 0.75–1.0 m high (Figure 11). Five trees are present in and around the pile. Scattered

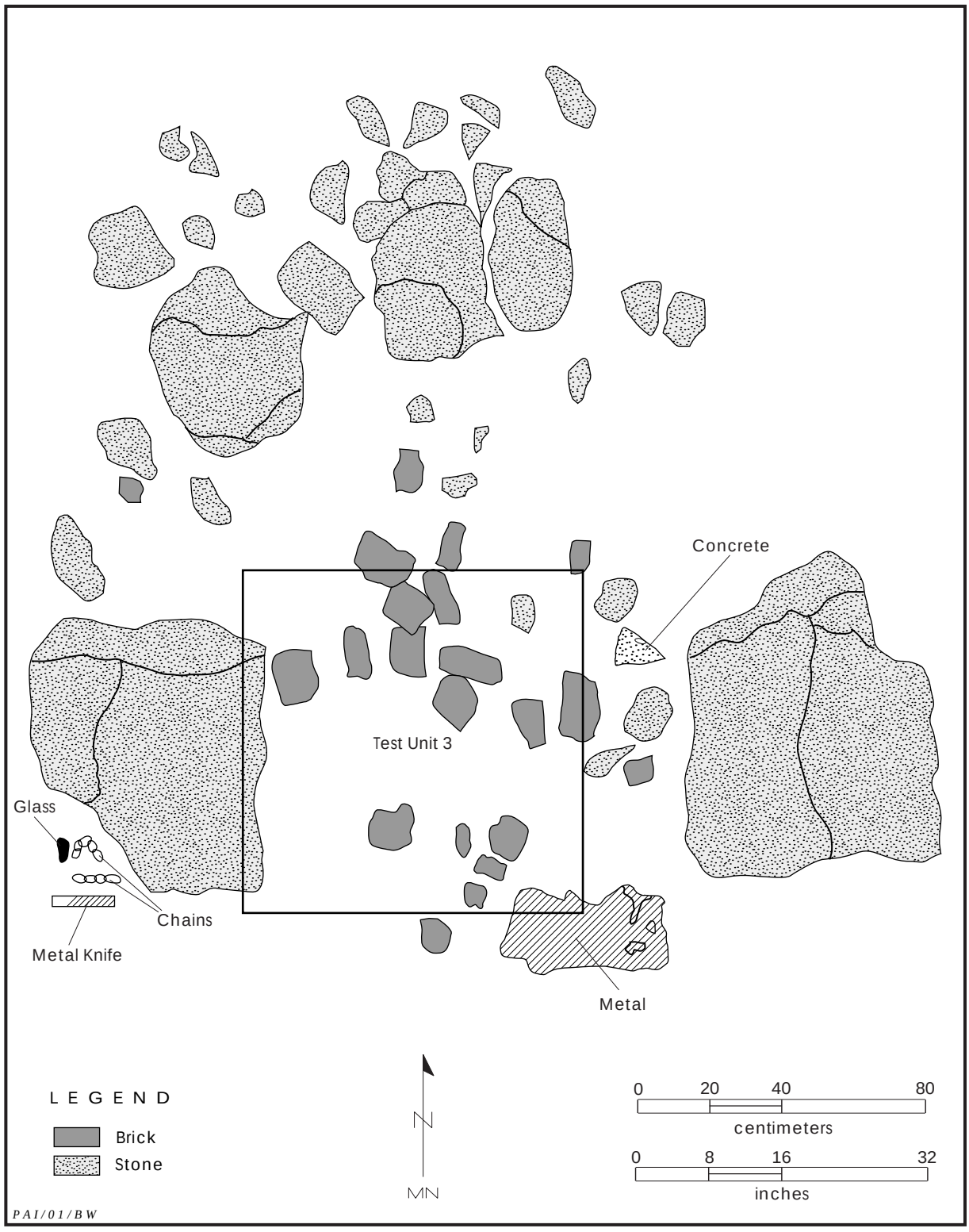

Figure 10. Plan view of Feature 3 at the Erath/McLennan House, 41ML140.

Figure 11. Photograph of Feature 4 at the Erath/McLennan House, 41ML140. View is northwest.

among the stone rubble are window glass sherds, a blue transfer-print sherd, and various bricks, three of which have makers' marks. These marks are: "BUTLER" made by the Mike Butler Brick Company in Harris County, 1892–1915; "A. P. GREEN F. B. CO. / EMPIRE D. R." made by the A. P. Green Refractories in Sulpher Springs, Hopkins County, 1954 to present; and "WACO B. CO." made by the Waco Brick Company in Waco, McLennan County, 1907–? (Steinbomer 1982). Initially, two stones in the rubble pile appeared to be in situ on the south side; therefore, this is where Test Unit 4 was placed to test the integrity of the feature. However, excavation revealed jumbled rubble in a brown loam matrix. A 5-cm-thick charcoal lens was encountered and likely associated with a collapsed, rusty stovepipe situated in the eastern part of the unit. The thickest part of the rubble was 0.9 m, and no intact deposits were discovered. Artifacts from the unit include stones, machine-made bricks, nails, miscellaneous metal, glass fragments, a complete bottle, and a shell button. Prikryl and Jackson (1985:176) suggest that this feature is a collapsed chimney, but the current investigations indicate that the feature is a push pile of rubble.

FEATURE 5

Feature 5 lies approximately 4 m southwest of Feature 1. It is a low (20 cm) mounded area with artifacts scattered across the surface, covering about 2.4 m north-south by 2.2 m east-west (Figure 12). Cultural materials present on the surface include container glass; window glass; brick, concrete, and stone fragments; a metal rod; a drill bit; and a porcelain doll. Another small (1.5x1.5 m) artifact scatter is located ca. 2 m to the south. This scatter consists of items similar to those at the surface of Feature 5, such as container glass, window glass, miscellaneous metal, and brick fragments.

Test Units 1 and 6 were placed on the eastern part of Feature 5. The test units formed a 1x2-m arrangement with Test Unit 6 to the north. The upper 30 cm of the units consisted of dark brown silty clay loam sediments with abundant artifacts (74 percent of the total from these two units), especially cut and wire nails,

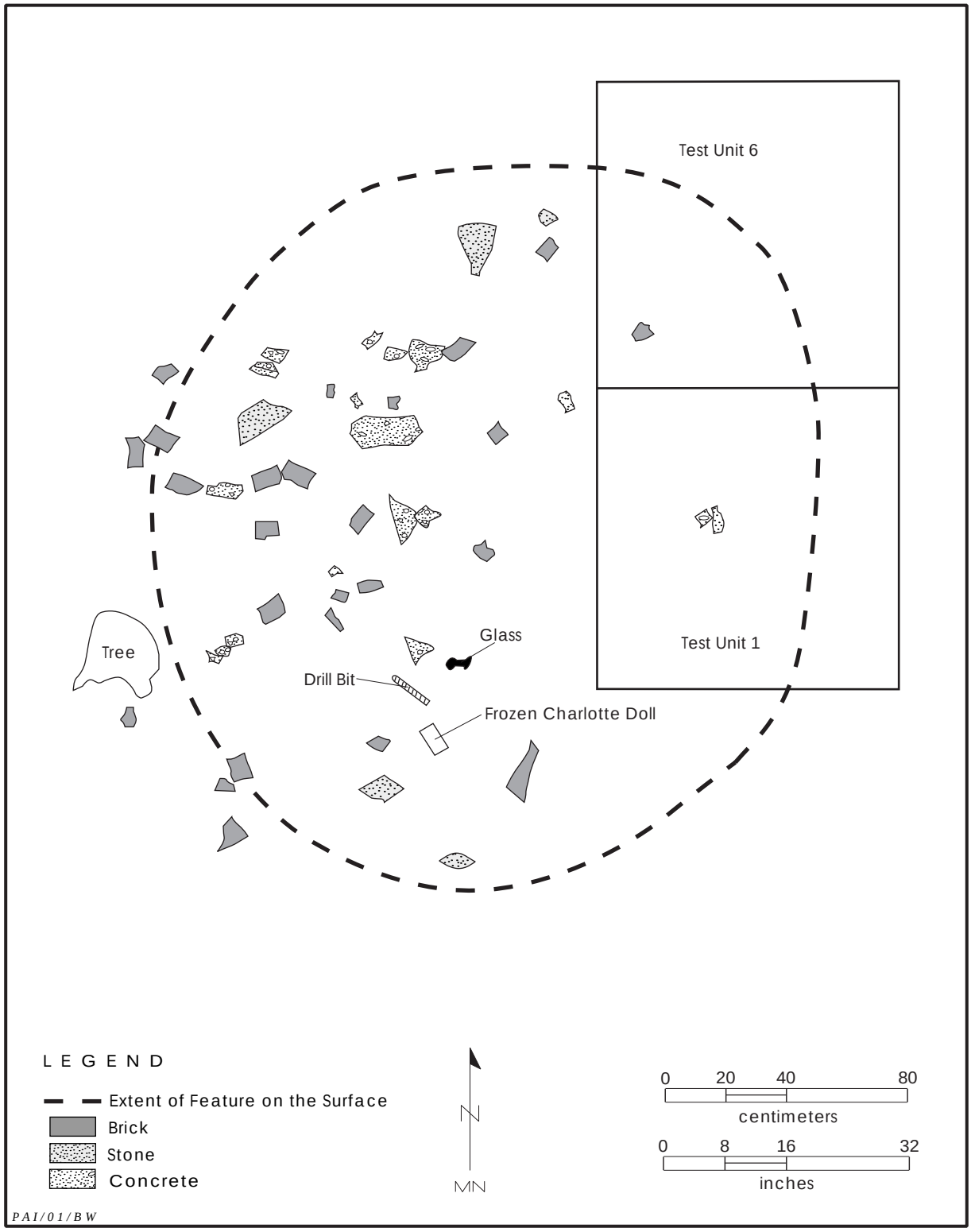

Figure 12. Plan view of Feature 5 at the Erath/McLennan House, 41ML140.

window glass, and container glass, along with charcoal and small numbers of rocks, brick fragments, and animal bones. In Level 4, a concentration of ca. 25 largely flat-lying rocks, some as large as 30–35 cm and some exhibiting pink thermal discoloration, was encountered. These rocks were most frequent in the northeastern quarter of Test Unit 1, but some occurred in the central and south-central parts of this unit and throughout the east half of Test Unit 6; no particular arrangement of the rocks could be discerned. Artifacts were recovered in smaller numbers than the overlying levels, along with charcoal and bones. In Level 5 and extending into Level 7, a roughly circular deposit of ash and charcoal was encountered. It measured ca. 90 cm north-south (ca. 20 cm in the southern part of Test Unit 6 and 70 cm in the northern part of Test Unit 1) by 75 cm east-west, extending into the east walls of both units. About 13 rocks (5–40 cm in diameter) were present beyond the ash deposit or on its edges, mostly in the northeastern quadrant of Test Unit 6. Other artifacts, including faunal remains, occurred in small numbers. Level 8 below the ash deposit was culturally sterile reddish brown clay loam.

The ash and charcoal deposit in Levels 5–7 and the high densities of artifacts, including faunal remains, suggest that Feature 5 represents a locus of trash disposal. Though pit boundaries were not visible in the dark brown surface sediments, the thin ash lens with charcoal at its base along the bottom of the feature hints that a pit may have been dug slightly into the reddish brown clay loam subsoil (Figure 13), and that trash may have been burned in this pit. The relative concentration of faunal remains (63 percent) in Levels 5 and 6 and the fact that most of the obviously burned artifacts (both of the burned ceramic sherds and 17 of the 19 pieces of melted glass) were found in Levels 1–3 suggest that these initial burning episodes may have involved food refuse rather than discarded domestic debris. As discussed below, the diagnostic artifacts from the lower levels of Test Units 1 and 6 indicate that these trash disposal activities began during the early occupations of the site, with the upper levels containing early-twentieth-century remains as well. The mounded nature of Feature 5 on the surface presumably reflects the continued use of this part of the site for trash discard during the later occupations.

FEATURE 6

Located ca. 3 m east of Feature 4 is a broad surface scatter of bricks designated Feature 6. The scatter measures about 7 m north-south by 5 m east-west. Cultural materials noted on the surface consist of container glass, window glass, stoneware, ironstone, machine-made brick fragments, and a few sandstone rocks. Test Unit 5 was placed in the central part of the scatter in an area where possibly in situ bricks were noted. The surface bricks were mapped and removed, revealing a second layer of mortared bricks lying on their sides in Level 1 (Figure 14). The orientation and alignment of the bricks indicate collapse in an east-west direction. Near the bottom of Level 1, beneath the brick layer, were fragments of decomposing wood along with numerous nails, glass sherds, and other household debris, most of which exhibited evidence of burning. Below these materials at ca. 19 cm was sterile reddish brown clay loam. No cultural materials were observed below 20 cm. Feature 6 appears to represent a fallen brick chimney.

UNNUMBERED FEATURES

The last two features have not been assigned numbers. These are a concrete foundation for a two-hole privy in the northern part of the site and a collapsed galvanized metal water tank and associated concrete foundation in the southern part of the site. The privy consists of poured concrete creating two separate rectangular sections (Figure 15). Dimensions of the feature are 1.4x1.25 m. No excavations were conducted here. The surrounding artifact scatter covers an area ca. 15 m north-south by 10 m east-west. The artifacts consist of container glass, Bristol-glazed stoneware, a paint can lid, and sanitary cans. Large fragments of displaced concrete—possibly from the privy—were found south of the foundation.

The dented and semicollapsed, corrugated, galvanized metal water tank is lying on the ground ca. 10 m south of Features 4 and 6. Manufacturer's writing is present on the west side of the tank ("...nam Machine's") (Figure 16). The adjacent concrete feature appears to be the base that supported the superstructure for the tank. It measures 1.4x1.2 m. Threaded metal bolts and nuts are

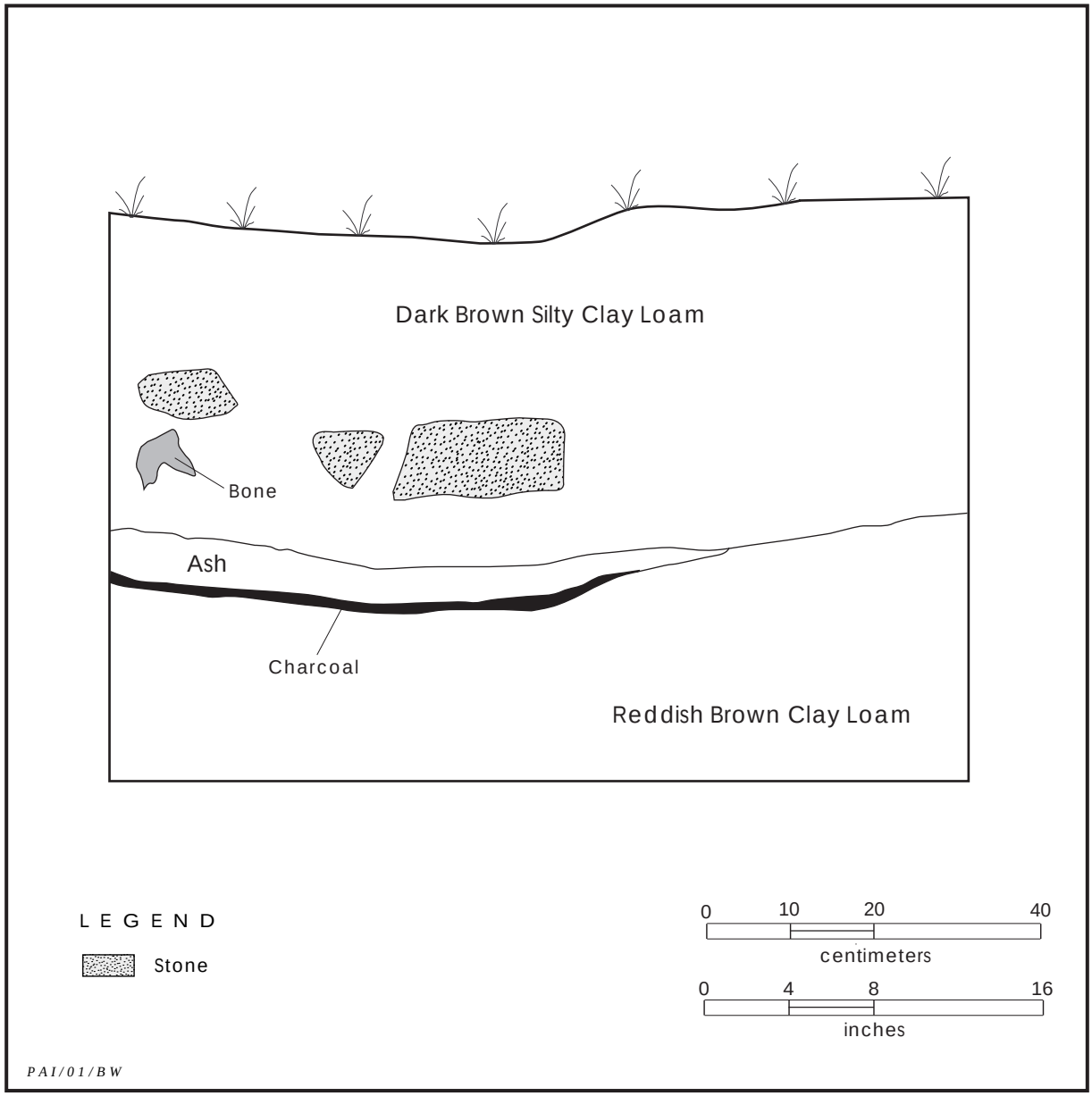

Figure 13. Profile of the east wall of Test Unit 1 in Feature 5 at the Erath/McLennan House, 41ML140.

present at all four corners of the pad, and portions of graffiti ("CAB" and "RB") etched in the surface are readable. The pad appears to have been displaced from its original location, although its association with the tank suggests that the original location was nearby. The drilled well that likely provided water for the tank is not evident on the surface. No excavations were conducted near these features.

Materials Recovered

The artifacts recovered from the excavations at 41ML140 consist mostly of ceramics (n = 103), glass (n = 679), metal (n = 958), and faunal remains (n = 200) (Table 2). Small amounts of other materials recovered consist of buttons (n = 2), mortar (n = 3), a charcoal pencil (n = 1), and miscellaneous materials (n = 6).

Figure 14. Photograph of Feature 6 as exposed in Test Unit 5 (Level 1) at the Erath/McLennan House, 41ML140. View is south.

Figure 15. Photograph of concrete privy foundation at the Erath/McLennan House, 41ML140. View is southwest.

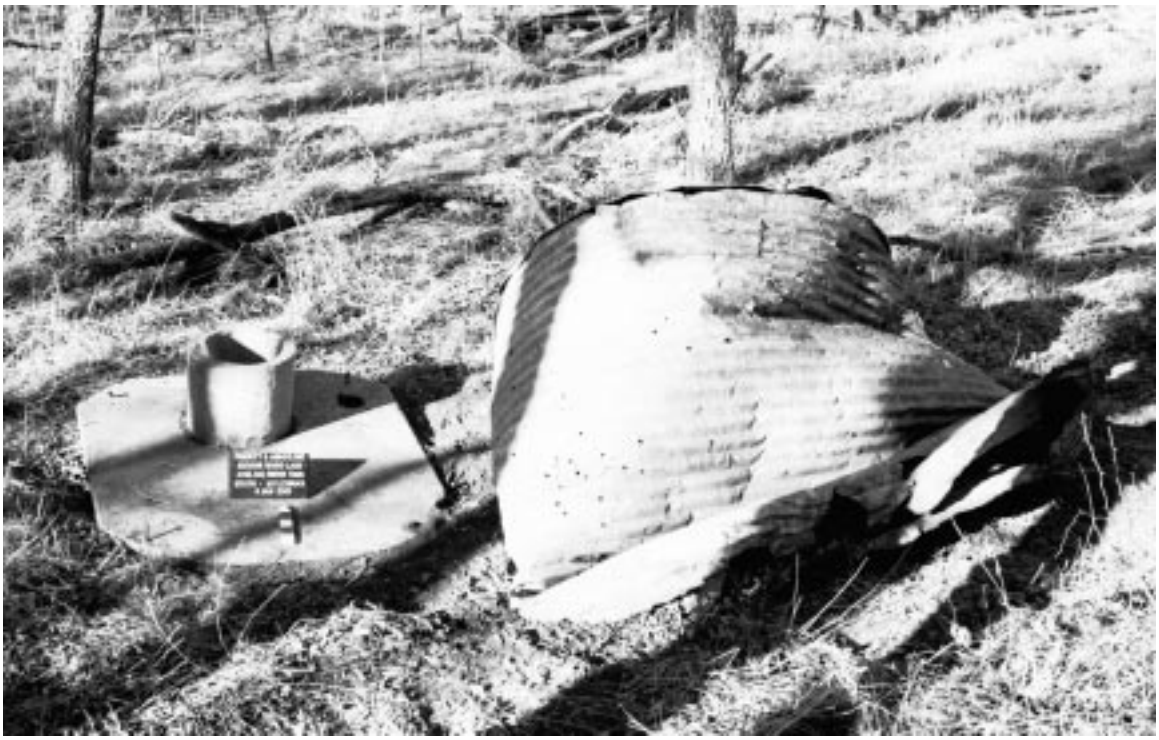

Figure 16. Photograph of concrete pad and galvanized water tank at the Erath/McLennan House, 41ML140. View is north.

CERAMICS

Of the 103 ceramic sherds, 85 are whiteware, 7 are stoneware, 8 are porcelain, and 3 are other miscellaneous ceramic objects.

Whiteware

The 85 whiteware sherds exhibit the following decorative types: undecorated (n = 46), molded ironstone (n = 11), molded and gilded (n = 2), decalcomania (n = 1), transfer printed (n = 15), transfer printed and enameled (n = 1), flow blue (n = 2), handpainted (n = 5), and annular ware (n = 2). Most diagnostic are the transfer-printed whiteware sherds (Figure 17). With the exception of a single sherd recovered from the surface, all are associated with Feature 5, a refuse disposal deposit.

Transfer-printed ceramics are highly diagnostic because they can be dated accurately to short spans of time. Identified patterns consist of: Columbia, a blue transfer print made by William Adams & Sons, ca. 1842–1858 (Blake and Freeman 1998:48); Florilla, green enamel on a purple transfer print, made by Edward Challinor, 1842–1867 (Blake and Freeman 1998:62); Lozere, a blue transfer print also made by Edward Challinor, 1842–1867 (Blake and Freeman 1998:78); Sirius, recovered in both blue and brown transfer prints, made by James and Thomas Edwards, 1839–1841 (Pollan et al. 1996:70); and Colonna, a purple transfer print made by Thomas Goodfellow, ca. 1828–1859 (Williams and Weber 1998:13). Due to the early dates of these artifacts, some of the materials deposited in Feature 5 clearly are associated with occupation and activities by George Erath who established his plantation ca. 1850–1851 and sold it in 1868.

Stoneware

Although only seven sherds of stoneware were recovered, they represent five different types, and at least that many vessels. Stoneware glaze types consist of Bristol (n = 1), Bristol and Albany (n = 1), Albany (n = 2), salt glazed and Albany (n = 1), and salt glazed (n = 2). With

Table 2. Summary of cultural materials from 41ML140

Provenience	Ceramics	Glass	Metal	Faunal	Other	Totals
Surface	2	–	–	–	–	2
TEST UNIT 1						
Level 1 (0–10 cm)	4	14	38	–	1	57
Level 2 (10–20 cm)	11	93	104	23	2	233
Level 3 (20–30 cm)	4	38	51	8	–	101
Level 4 (30–40 cm)	5	9	2	7	–	23
Level 5 (40–50 cm)	5	5	5	36	–	51
Level 6 (50–60 cm)	4	4	3	14	–	25
Level 7 (60–70 cm)	3	–	3	2	–	8
Subtotals	36	163	206	90	3	498
TEST UNIT 2						
Level 1 (0–10 cm)	1	14	–	1	–	16
Level 2 (10–20 cm)	–	13	–	14	–	27
Level 3 (20–30 cm)	–	2	–	10	–	12
Subtotals	1	29	0	25	0	55
TEST UNIT 3						
Level 1 (0–10 cm)	10	21	104	1	–	136
Level 2 (10–20 cm)	4	5	1	6	–	16
Level 3 (20–30 cm)	2	–	1	2	–	5
Subtotals	16	26	106	9	0	157
TEST UNIT 4						
Level 1 (0–10 cm)	–	1	–	–	–	1
Level 3 (20–30 cm)	–	–	6	–	–	6
Level 4 (30–40 cm)	–	–	10	–	–	10
Level 5 (40–50 cm)	1	16	25	–	1	43
Level 6 (50–60 cm)	1	11	48	–	–	60
Level 7 (60–70 cm)	–	3	5	–	–	8
Level 8 (70–80 cm)	–	3	1	–	1	5
Subtotals	2	34	95	0	2	133
TEST UNIT 5						
Level 1 (0–10 cm)	4	184	210	–	4	402
Level 2 (10–20 cm)	1	143	116	5	2	267
Subtotals	5	327	326	5	6	669
TEST UNIT 6						
Level 1 (0–10 cm)	–	5	4	–	–	9
Level 2 (10–20 cm)	10	50	104	5	–	169
Level 3 (20–30 cm)	9	27	65	20	1	122
Level 4 (30–40 cm)	5	12	16	4	–	37
Level 5 (40–50 cm)	3	2	18	19	–	42
Level 6 (50–60 cm)	13	4	17	21	–	55
Level 7 (60–70 cm)	1	–	1	2	–	4
Subtotals	41	100	225	71	1	438
TOTALS	103	679	958	200	12	1,952

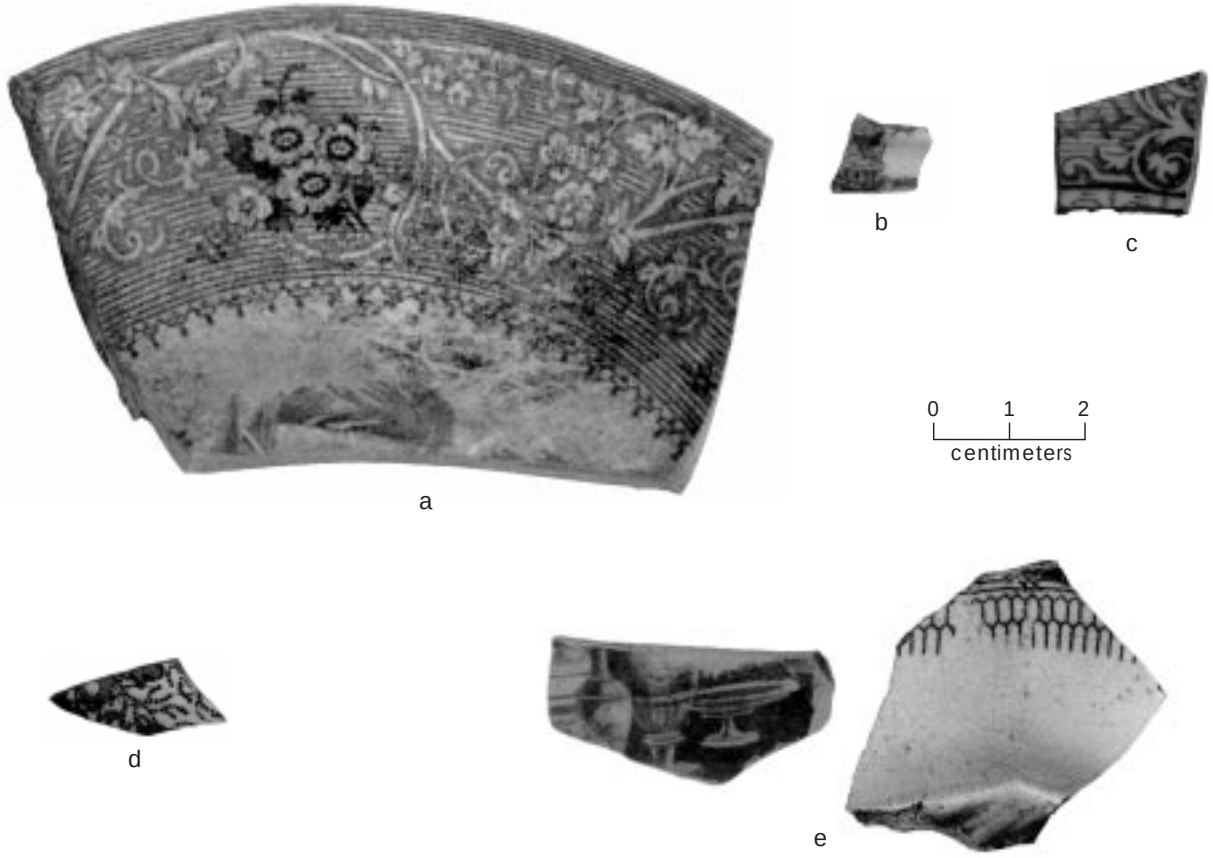

Figure 17. Transfer-printed ceramics from 41ML140. (a) Columbia; (b) Florilla; (c) Lozere; (d) Sirius; (e) Colonna.

only a single exception, all stoneware sherds were recovered from Feature 5. This probably correlates with a higher reliance on stoneware for the storage of preserved foodstuffs in the mid-nineteenth century, before the advent of readily available glass canning jars (Lebo 1987:121).

Porcelain

Only eight sherds of porcelain were recovered. All are bone china, a kind of soft-paste porcelain commonly manufactured in the nineteenth century and later (Majewski and O'Brien 1987:126–127). All but one of the bone china sherds were recovered from contexts other than Feature 5, perhaps reflecting the increasing availability and affordability of bone china over time.

Other Ceramics

The remainder of the ceramics assemblage consists of a porcelain doll, an industrial ceramic disk of unknown function, and an unrefined earthenware marble (possibly homemade).

GLASS

Glass artifacts recovered fall into five general categories: table glass (n = 20); kerosene lamp chimney glass (n = 25); container glass (n = 254); window glass (n = 212); and unidentified/melted or other glass (n = 168).

Table Glass

Table glass is defined as "glassware used on the table and associated with food and drink,

as well as some items of decorative glassware, such as vases" (Jones and Sullivan 1989:127). The 20 sherds recovered consist of opaque white/milk glass (n = 6), lead glass (n = 8), clear/colorless glass (n = 4), and solarized glass (n = 2). Of particular note is the lead glass tableware, most commonly found on sites predating 1860 (Jones and Sullivan 1989:12). All of the lead glass tableware sherds are from Feature 5.

Kerosene Lamp Chimney Glass

Twenty-five sherds of glass from the chimney portion of kerosene lamps were recovered. Both lead glass (n = 8) and clear, nonlead glass (n = 17) specimens are represented. Although lead glass was replaced by soda lime glass in the 1860s for the manufacture of tableware, lead glass continued to be used for making lamp chimneys through the latter portion of the nineteenth century and even into the early twentieth century (Woodhead et al. 1984:61).

Container Glass

A total of 254 sherds of container glass (primarily from bottles and jars) were recovered. Colors represented are aqua (n = 48), clear/colorless (n = 162), brown (n = 28), solarized (n = 4), blue (n = 3), green (n = 4), and olive (n = 5). Most of the colors are not diagnostic because of their extended use in container production. Exceptions are solarized glass, which was made primarily from ca. 1875 to 1914 (Jones and Sullivan 1989:13), and olive green glass, which became increasingly uncommon after the 1860s (Jones 1986:10). All olive glass recovered from 41ML140 came from Feature 5.

Window Glass

A total of 212 window glass sherds were recovered. Although window glass was present across the site, the greatest concentration occurred in association with Feature 6, which is interpreted as a collapsed chimney.

Unidentified/Melted or Other Glass

Of the 168 artifacts in this category, 2 represent canning jar lid liners, 1 made of clear glass and the other of opaque white glass. The rest of the artifacts are glass fragments that have been melted or otherwise distorted by fire so that identification beyond material type is impossible.

METAL

Metal artifacts constitute the largest group of artifacts recovered. Artifact types consist of door hardware (n = 2), cut nails (n = 561), wire nails (n = 187), screws (n = 4), wire (n = 19), fencing staples (n = 19), tin can fragments (n = 20), clothing fasteners (n = 4), ammunition (n = 7), unidentified metal (n = 108), and miscellaneous metal (n = 27).

Door Hardware

Both a hinge and portion of a metal doorknob were recovered. These relate to doors that were part of the house, or perhaps to furniture items (such as hutches, cupboards, etc.) that might have served as furnishings inside the house.

Cut Nails

Of the fasteners used in constructing the house at 41ML140, cut nails (n = 561) represent the most common type. Initial occupation of the property reportedly took place in 1851, and it is likely that the initial episode of construction took place at that time. Additional construction also probably occurred after Duncan McLennan acquired the property in 1868. The presence of cut nails in large numbers is consistent with this.

Wire Nails

In comparison, only 187 wire nails were recovered from the site. They most probably represent later expansion and repairs to the existing structure under the ownership of Duncan McLennan.

Screws

Four pointed-tip wood screws were recovered, all associated with the upper 30 cm of Feature 5. Such screws could have been used either in construction of the house or as fasteners for furniture or other items.

Wire

Wire fragments (n = 19) of a variety of types and gauges (including plain and barbed) were recovered. Used for a multitude of tasks on a farm, wire would have been used heavily in the late nineteenth century, and later, for fencing off the house and yard from cultivation and livestock areas.

Fencing Staples

Directly related to the use of wire for fencing are staples to secure wire to vertical support posts. Nineteen fencing staples were recovered, with a fairly tight correlation between the horizontal distribution of wire fragments and fencing staples.

Tin Can Fragments

A fairly small number (n = 20) of identifiable tin can fragments were recovered. All came from deposits no deeper than 30 cm. The surprisingly small number of tin can fragments, usually copious in sites occupied in the late nineteenth century, suggests that dumping of bulk refuse might have taken place at a location away from the main habitation.

Clothing Fasteners

Four metal clothing fasteners were recovered from Lev!el 2 of Test Unit 6 in Feature 5. All are components from overalls and consist of a slide buckle, two rivets, and a metal button/rivet face stamped "TEN WHEELER."

Ammunition

Seven fragments of ammunition were recovered, with a widely dispersed horizontal distribution pattern. Ammunition types include both shotgun shell heads and metal cartridge casings.

All shotgun shell heads have manufacturers' marks. The three recovered are: Winchester Ranger 16 gauge, which is a twentieth-century type; Peters High Velocity 16 gauge, 1897–1935; and Union Metallic Cartridge Company New Club 10 gauge, ca. 1936 (Vinson 1968:91–93). A single brass .410 Remington Express casing was recovered as well. Two .22-caliber short cartridges manufactured by the Union Metallic Cartridge Company after 1885 were recovered, as was one Super X .22-caliber short cartridge manufactured by the Western Cartridge Company, postdating 1927 (Barber 1987:48, 86).

Unidentified Metal

Artifacts identifiable to material type (ferrous metal) only and for which no functional identifications are possible are assigned to the category of unidentified metal (n = 108). Although distributed widely both horizontally and vertically, the largest concentration of unidentified metal (n = 29) was in Level 6 of Test Unit 4 in Feature 4, which is interpreted as a push pile of rubble.

Miscellaneous Metal

Metal artifacts that are identifiable functionally but do not fit easily into any of the other established categories are classed as miscellaneous metal (n = 27). These are a can key, buckles (n = 2), a lead fragment, a bayonet, fragments of zinc canning jar lid (n = 6), a cotter pin, bottle caps (n = 3), a horse bit, a ferrule, a gear, a corkscrew, a bolt lock fastener, a metal brace, fragments of window screen (n = 2), an eye hook, a pocket knife blade, a handle, and a farm implement part.

MISCELLANEOUS ARTIFACTS

Artifacts that are identifiable in material and/or function but do not fit easily into any of the other established categories are classed as miscellaneous (n = 212). This category contains a charcoal pencil, vertebrate faunal remains (n = 183), invertebrate faunal remains (n = 17), mortar fragments (n = 3), buttons (n = 2), and miscellaneous materials (n = 6).

Charcoal Pencil

A single fragment of a charcoal pencil was recovered from Level 1 of Test Unit 5.

Vertebrate Faunal Remains

Although bones were recovered from across the entire site area, vertebrate faunal remains

(n = 183) were concentrated in Test Units 1 and 6 in Feature 5. Identified taxa are Vertebrata (vertebrates, n = 24), *Bufo* sp. (toads, n = 1), Aves (duck/turkey-sized, n = 3), Mammalia (canid/deer-sized, n = 102), Mammalia (deer/bison-sized, n = 24), Artiodactyla (goat/deer-sized, n = 2), *Sus scrofa* (pig, n = 25), *Bos/Bison* (cow/bison, n = 1), and *Ovis/Capra* (sheep/goat, n = 1) (see Appendix C). The 144 bones recovered from Feature 5 probably represent food remains.

Invertebrate Faunal Remains

None of the 17 shell fragments collected are sufficient for taxonomic identification (see Appendix B). Although they are exclusively from Feature 5, few conclusions can be drawn about their presence.

Mortar

Three fragments of mortar were collected as samples.

Buttons

Two shell sew-through-type buttons are in the assemblage.

Miscellaneous Materials

A small number (n = 6) of other materials were recovered. Although most are cultural, they are not historic or otherwise related to the historic occupations at 41ML140. They are a mud dauber nest, debitage (n = 3), a plywood fragment, and a piece of asphalt.

Chronology and Components

The chronology for 41ML140 is based on the artifacts recovered, the features documented, and archival evidence of activity on the property. Two primary components are present at the site. The earlier component is defined most certainly by the lower part of Feature 5 (a refuse disposal area), and perhaps by Feature 1 (a cistern/well) and Feature 2 (a chimney foundation). Based on the strong correlation between the archivally documented occupation by George Erath (ca. 1850–1868) and the manufacture date range (ca. 1828–1867) of the transfer-printed ceramics recovered from Feature 5, the early component clearly is associated with Erath's activities.

The surface manifestation of Feature 5 appeared to be a late-nineteenth-century rubble mound with little indication that it was associated with an early occupation. Upon investigation, however, it appears that the area had been established early as a dumping locale and continued to function as such. Within the feature, an ash and charcoal deposit with faunal materials and mid-nineteenth-century artifacts was encountered. The upper perimeter of this refuse pit was obscured, perhaps by a lack of contrast with surrounding soils and continued later use for trash disposal. The bottom part of this feature appears to represent the most direct and undisturbed evidence of Erath's activity at 41ML140.

The later historic component dates to the period of purchase in 1868 and subsequent use by Duncan McLennan and presumably tenants of Nannie Sinclair. This activity is represented by Feature 4 (a push pile), Feature 6 (collapsed chimney), and the two unnumbered features (a privy and a metal water tank with associated foundation). Based on the construction materials in the surface features, the surface artifacts, and the artifacts recovered from excavation, the secondary component dates from the late nineteenth century (ca. 1870s) until the early twentieth century (1920s) and later. The house and outbuildings were expanded and updated, as evidenced by the presence of bricks, concrete, galvanized metal, and wire nails among the construction debris.

While most of the features can be associated with one or another of the two components, it is difficult to get a clear picture of the layout of the house and immediately surrounding area for either component. This is because few intact features directly related to the house (e.g., chimney bases and foundation footings) survived clearing activities that presumably accompanied Corps acquisition of the site in 1962. The report on the 1984 survey during which the site was recorded (Prikryl and Jackson 1985:33) includes an artist's reconstruction of the house based on a photograph in a 1954 volume on historic log cabins in McLennan County, but it is impossible to correlate the archeological features with elements shown on this depiction, which indicates a large L- or T-plan house with three chimneys.

Further, the documented features represent a small portion of what must have been much larger agricultural complexes. The various components related to crop and livestock production, particularly outbuildings and the domestic quarters for Erath's slaves, are not represented at this site. Only the simplest of activities can be interpreted from these features. The remains of Erath's original home and later additions to it are present, as are two water sources and a refuse pit. Artifact recovery indicates the use and discard of a common assortment of domestic goods, including table ceramics and container glass, as well as the cooking and consumption of domestic and wild animals. Beyond these simple conclusions, however, little can be said.

Summary and Assessment

Site 41ML140 is the location of the housesite occupied by George Erath (1850–1868) and Duncan McLennan (1868–1930) and probably subsequently by tenants of Nannie Sinclair. It has at least eight cultural features and numerous artifacts associated with this occupation span. However, only part of one investigated feature (a trash disposal area) yielded intact, archeologically important, mid-nineteenth-century deposits of artifacts and faunal remains. Approximately two-thirds of this feature was excavated during testing, leaving little potential for it to yield additional information. Elsewhere on the site, the cultural materials representing the various occupations are mixed together, offering little opportunity to isolate early assemblages that could contribute important information. The features provide limited information on the general layout of the immediate house area, and 41ML140 represents only the core habitation; the larger plantation/farming complex of which the residence was a part remains unidentified archeologically and perhaps is partly under the waters of Waco Lake. Hence, 41ML140 has little capacity to contribute important information concerning the use of space and activity areas. The sparseness of contexts containing isolable early assemblages and the inability to address issues related to overall plantation/farmstead layout render the site ineligible for National Register listing under Criterion D.

Site 41ML160

Description

Site 41ML160 is a deeply buried prehistoric site on the southwestern bank of the North Bosque River near the upper end of Waco Lake (see Figure 4). It is situated within Holocene terrace deposits, with cultural materials recorded at elevations of 458 to 467 ft. A flood chute cuts east-west across the terrace south of the site. Oak, elm, and pecan trees dominate the vegetation in the area, with a dense understory consisting of junipers, greenbriers, and shrubs.

Previous Investigations

Site 41ML160 was recorded in 1984, at which time the lake level was lower than normal at 450 ft (Prikryl and Jackson 1985:87–91, 209–210). Initial investigations included inspection of a 120-m segment of the cutbank, where 20–25 mussel shells, 5–10 burned rocks, 2 pieces of debitage, and a few animal bones were observed at various depths between 1.0 and 5.0 m below the surface in the 6-m-high cutbank. One mussel shell fragment with an intentionally modified edge was collected, as was a bone fragment identified as a thoracic vertebra of a deer. Subsequent investigations included the cleaning and profiling of a 2-m-wide and 2-m-high section of the cutbank in a location where at least 1–2 m of the upper deposits had been lost to slumping. Two stratigraphic zones were identified in this profile. The upper one extended to 1.3 m below the top of the profile and consisted of grayish brown silty clay loam, with a lens of mussel shells and charcoal flecks at 1.0–1.1 m below the top of the profile. It was separated from the lower zone, consisting of culturally sterile alternating deposits of grayish brown clayey silt and light brown sandy silt, by 2–8 cm of oxidized organic clay that also appeared to be culturally sterile. The oxidized lens was found about 3.7 m below the ground surface.

Site 41ML160 was revisited by boat in 1999 as part of a site re-location and reassessment effort (Kvernes et al. 2000:53–54). Investigation was limited to inspection of 150 m of the cutbank exposure; no shovel tests were excavated because of the depth of the cultural deposits. The lake level was 455 ft, and the ex-

posed cutbank extended about 4.5 m above the water. It was noted that slumping of the cutbank had continued since 1984. Burned rocks, mussel shells, and bones were observed in the cutbank at a depth of approximately 3 m below the surface. The two natural stratigraphic zones recorded in 1984 were visible with some discoloration to the lower zone, probably because of the fluctuating lake level.

Work Accomplished

During the 2000–2001 investigations, a long rebar stake was used as the primary datum and was given an arbitrary elevation of 100.00 m. The datum was placed ca. 12 m east of the cutbank edge and ca. 5 m northeast of Trench 2. A second datum (rebar) was placed near a large oak tree in the northern area of the site ca. 2.5 m east of Trench 4.

Five trackhoe trenches were excavated (Figure 18). Trench 1 was placed at the southern end of the site area near the upstream end of the flood chute and close to the lake edge. It measured 8.2x2.8x3.8 m and was aligned at 284°. Mussel shells were noted in the south wall at 215 cm, while charcoal was observed at ca. 385 cm. Trench 2, oriented to 274° and placed 12 m north of Trench 1, displayed no observable cultural materials. This trench measured 8.3x2.9x4.2 m. Trench 3, excavated in the central part of the site area, was oriented to 282° and measured 8.0x2.7x4.2 m. Burned rocks and mussel shells were observed in the south wall at 270 cm. A thin gravel lens was present at 286 cm. Trench 4 was excavated ca. 20 m north of Trench 3. It measured 7.7x3.1x4.5 m and was oriented at 302°. A single burned rock was discovered in the wall at 260 cm. Finally, Trench 5, aligned at 314° and measuring 8.3x3.3x4.2 m, encountered no cultural materials. This trench was situated ca. 25 m northeast of Trench 4.

Four test units were hand excavated. Test Units 1 and 2 were on the south side of Trench 1. These units went from the modern ground surface to deep into the alluvial deposits. Excavations were terminated at Level 35 (350 cm). Test Units 3 and 4 were on the south side safety bench of Trench 3. The first levels in these units began 130 cm below the modern ground surface, and the excavations ceased at Level 22 (350 cm). In total, 11.4 m^3 of fill were excavated.

Site Extent and Depth

Site 41ML160 originally was recorded by boat survey in 1984 (Prikryl and Jackson 1985:87–91, 209–210). Cultural materials (bones, debitage, and burned rocks) were observed at various depths (1.0–5.0 m) along a ca. 120-m stretch of cutbank of the North Bosque River. Subsequent investigations found a shorter stretch of the cutbank intact because slumping had occurred since 1984. These investigations also noted cultural materials at 3 m below the ground surface in the cutbank (Kvernes et al. 2000:53–54). Trenching in 2000–2001 covered an area ca. 80 m in length adjacent to the cutbank. Deeply buried cultural materials were restricted to the southern ca. 55 m of this area. Testing recovered cultural materials, mainly lithic debitage, from depths of 260 to 330 cm. Although no lithic materials were encountered deeper than 330 cm, mussel shells were collected from 330 to 350 cm.

Sediments and Stratigraphy

The sediments and stratigraphy at 41ML160 were examined through the profiles of five trenches and descriptions of the soil stratigraphy of three of the trench profiles (see Appendix A). The site is located on the inside of a meander and situated on a Holocene alluvial terrace that stands ca. 4–5 m above the North Bosque channel. A flood chute, which diverts floodwaters from the channel bypassing the meander loop, cuts across the terrace surface isolating the site and terrace from the larger broad terrace that flanks the channel in this part of the North Bosque River valley. Soils on the terrace surface belong to the Catalpa series (Templin et al. 1958). Catalpa soils are calcareous grayish brown to dark grayish brown clay loam to clayey soils formed on recent alluvium.

The alluvial deposits composing the terrace consist of fine-grained point bar facies and overbank sediments (Figure 19). The terrace surface is mantled by very recent alluvial sediments that are pedogenically unaltered. This deposit ranges from 27 cm thick in Trench 3 to 32 cm thick in Trench 5 and consists of alternating horizontal beds and laminae of pale brown fine to medium sand and grayish brown to dark gray mud. Along the terrace edge at the southern end of the site, this deposit has been

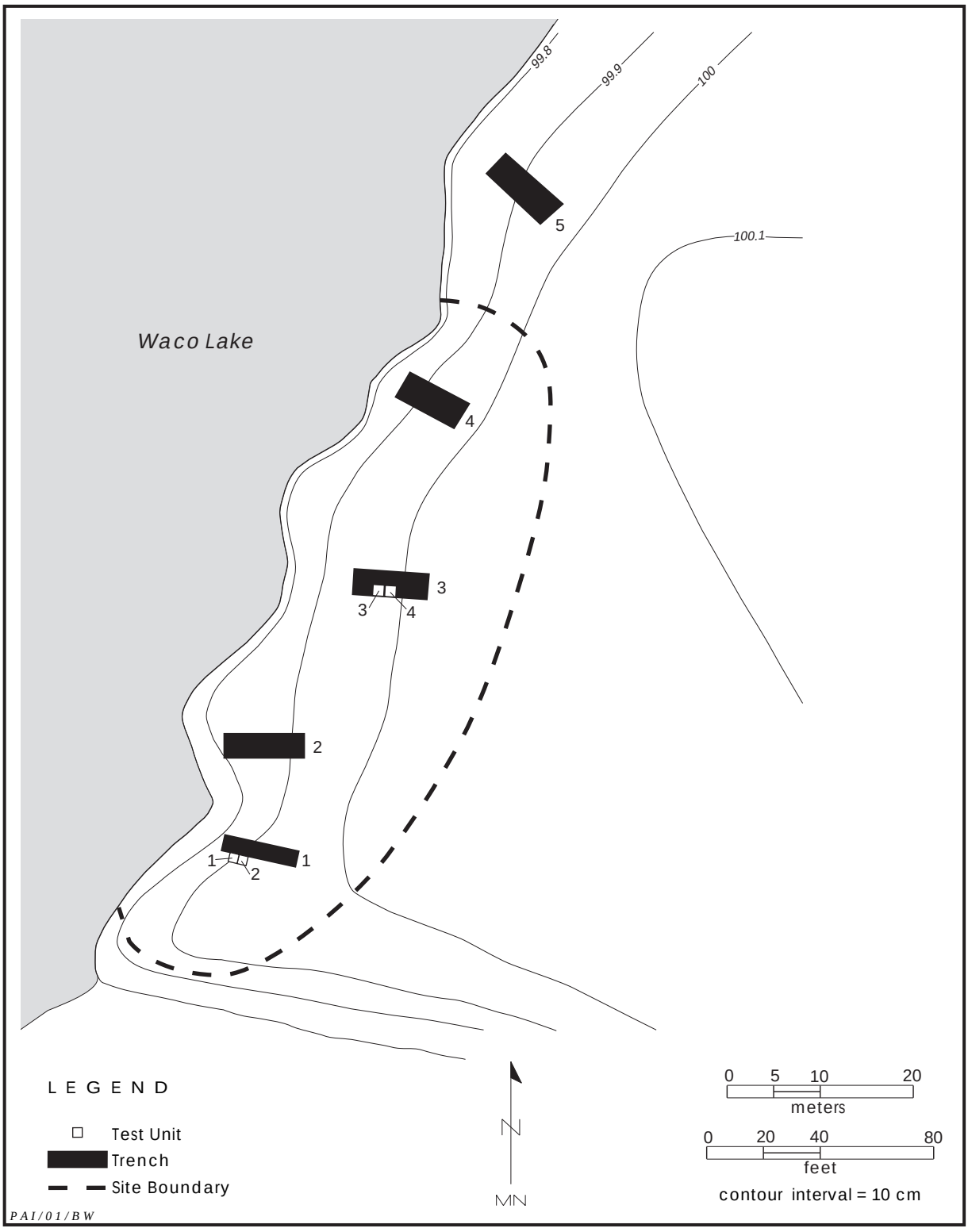

Figure 18. Map of 41ML160.

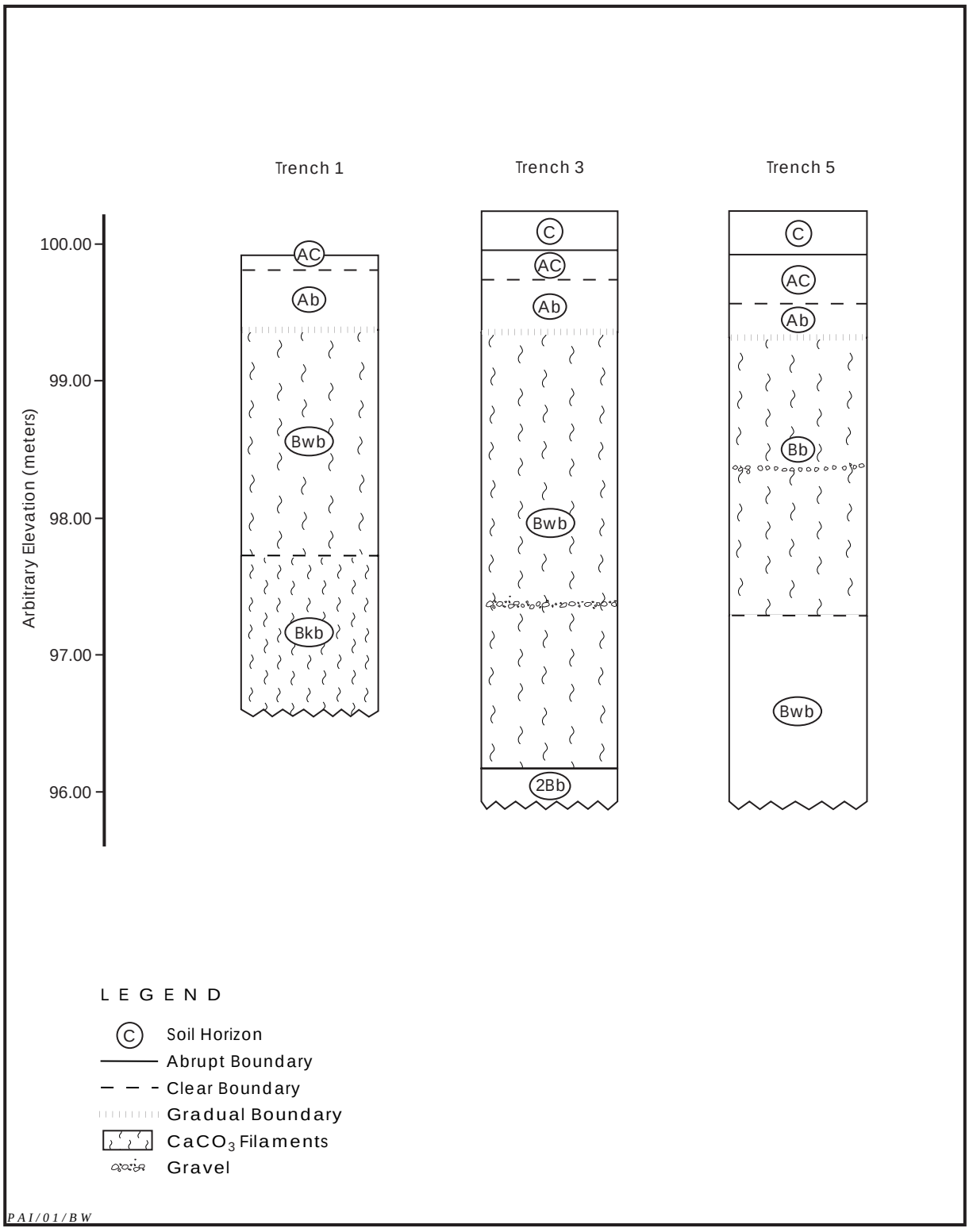

Figure 19. Profiles of Trenches 1, 3, and 5, 41ML160.

removed by erosion (see Figure 19, Trench 1 profile). Underlying the recent alluvial mantle is a thin (11–36 cm) bed of grayish brown to dark grayish brown silty clay loam to fine sandy clay loam alluvium. This deposit is imprinted with a weak soil (AC horizon) and contains a few poorly preserved beds and laminae of sand and mud, suggesting that this deposit also is recent in age and probably dates to the historic period. This deposit mantles what is believed to be the presettlement or prehistoric terrace surface. The prehistoric alluvial deposits are composed of fine-grained point bar facies with rare gravel stringers (chute gravels). Based on the degree of soil development imprinted on these alluvial deposits, it is estimated that the sediments are late Holocene in age. The profile of Trench 3 is typical of the profiles observed and examined at the site. It displays an Ab-Bwb-2Bb soil profile. The Ab horizon (50–86 cm) is a very dark grayish brown silty clay loam. The Bwb horizon (86–406 cm) is a prismatic-structured brown silt loam with a thin bed of coarse to very coarse sand and gravel at 286 cm. A very abrupt boundary separates the Bwb horizon from the 2Bb horizon (406–420+ cm). The 2Bb horizon is a brown clay loam with common reddish yellow mottles. The upper boundary, color, and mottling of this soil horizon suggest that it represents a separate stratigraphic unit and may predate the late Holocene.

Cultural Feature

One feature was encountered during testing. Feature 1, which was found in Test Unit 3, Levels 18–19 (304–313 cm), consists of burned or oxidized soil, charcoal, bone fragments, and burned rocks. The excavated portion measures about 70 cm north-south by 80 cm east-west; because it extends into the west and south walls of the unit, its full extent is unknown (Figure 20). The thickness of the feature varies from 5 to 6 cm, and its base is irregularly shaped in cross section.

Numerous bone fragments, 2 burned rocks, and charcoal were found in the feature. Two charcoal samples were collected from the same level—one from inside the feature and one from outside. The larger of the samples was submitted for radiocarbon assay but did not yield a sufficient amount of final carbon for dating. A few of the bone fragments show evidence of burning. Two flakes were found in association with the feature in the remaining test unit fill. Approximately 30.8 liters of sediment were collected from the feature. Nine pieces of microdebitage and 21 bone fragments were recovered during flotation (see Materials Recovered).

The oxidized sediment and the presence of charcoal and burned bones suggest that the feature is a hearth. The feature likely represents a hearth on an unprepared surface, as evidenced by the lack of abundant burned rocks and pit or basin.

Materials Recovered

Twenty-six chipped stone artifacts, 44 invertebrate faunal remains, and 114 vertebrate faunal specimens were recovered from the hand excavations at 41ML160 (Table 3). Other materials consist of burned rocks, which were observed during excavation but not collected.

CHIPPED STONE ARTIFACTS

Of the 26 chipped stone artifacts, 25 are unmodified pieces of lithic debitage and 1 is an edge-modified flake.

Unmodified Debitage

The unmodified debitage consists of 52 percent (n = 13) complete flakes, 12 percent (n = 3) proximal flakes, 20 percent (n = 5) chips, and 16 percent (n = 4) chunks. Cortex is present on 3 of the specimens (2–5 cm maximum size), none of which are chunks. The majority of the flakes are small with 36 percent (n = 9) of the assemblage less than 1 cm in size. All of these specimens were recovered from flotation of Feature 1 fill. The remaining assemblage has 10 specimens 1–3 cm in size and 6 specimens 3–5 cm in size. Raw material varies from a light gray chert with white mottles to dark gray and light and dark brown cherts.

Edge-modified Debitage

The single edge-modified flake has two modified edges and a maximum dimension of 5–6 cm. Categorized as a proximal flake fragment, cortex is present on its dorsal side. The cortex is brown while the interior chert color is a dark mottled gray.

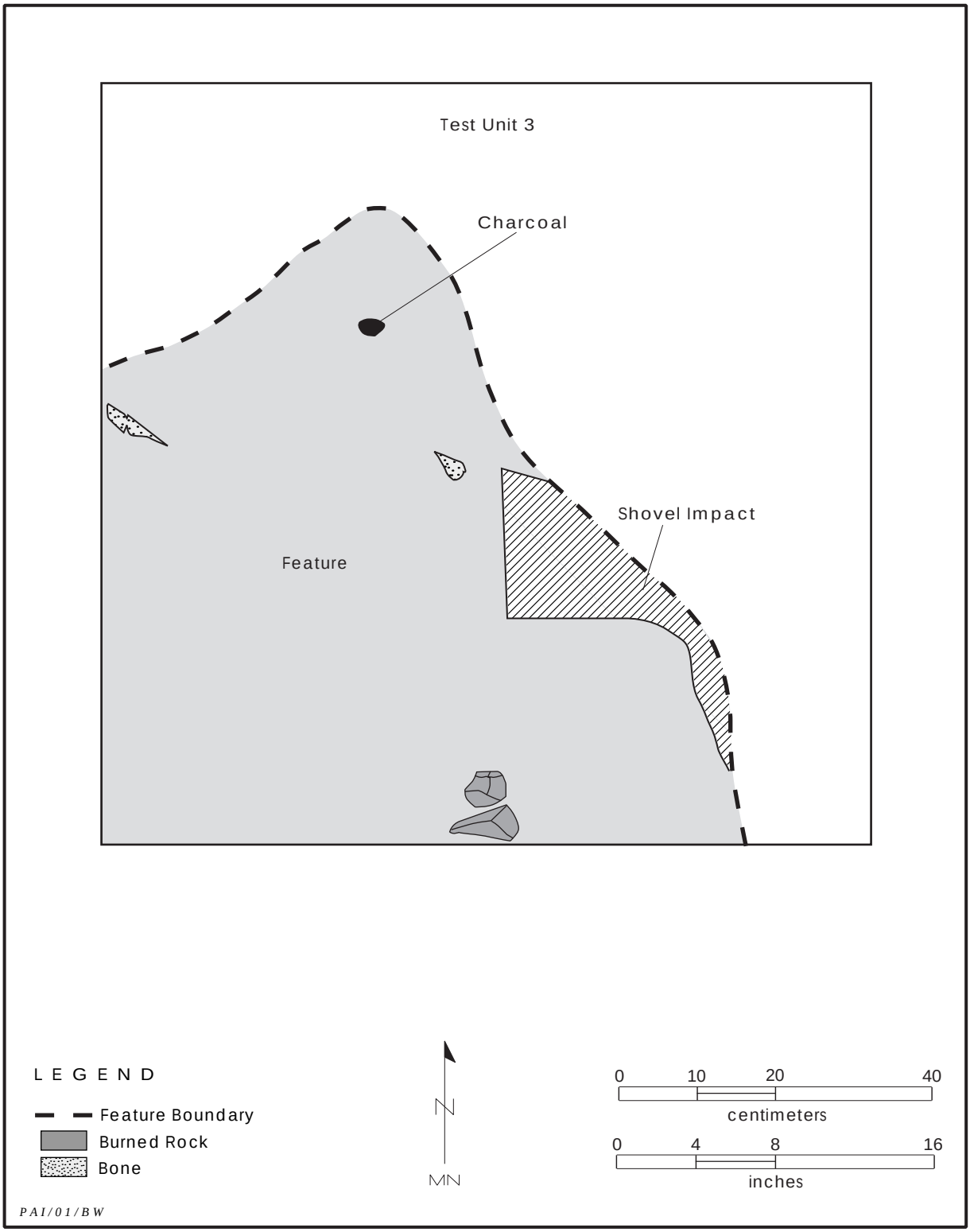

Figure 20. Plan of Feature 1, 41ML160.

Table 3. Summary of cultural materials from 41ML160

Provenience	Edge-modified Debitage	Unmodified Debitage	Unmodified Bones	Unmodified Mussel Shells	Totals
TEST UNIT 1					
Level 5 (40–50 cm)	–	–	–	1	1
Level 10 (90–100 cm)	–	–	–	2	2
Level 18 (170–180 cm))	–	–	–	1	1
Level 22 (210–220 cm)	–	–	–	1	1
Level 27 (260–270 cm)	–	1	–	2	3
Level 30 (290–300 cm)	–	–	–	1	1
Level 34 (330–340 cm)	–	–	–	3	3
Subtotals	0	1	0	11	12
TEST UNIT 2					
Level 32 (310–320 cm)	–	–	–	2	2
Level 33 (320–330 cm)	–	1	–	–	1
Subtotals	0	1	0	2	3
TEST UNIT 3					
Level 12 (240–250 cm)	–	–	–	1	1
Level 14 (260–270 cm)	1	4	–	4	9
Level 15 (270–280 cm)	–	1	–	2	3
Level 16 (280–290 cm)	–	–	–	2	2
Level 17 (290–300 cm)	–	1	–	–	1
Level 18 (300–310 cm)	–	2	33	–	35
Feature 1 (304–313 cm)	–	9	27	–	36*
Level 21 (330–340 cm)	–	–	–	3	3
Subtotals	1	17	60	12	90
TEST UNIT 4					
Level 5 (170–180 cm)	–	–	–	1	1
Level 14 (260–270 cm)	–	3	–	7	10
Level 15 (270–280 cm)	–	1	–	1	2
Level 16 (280–290 cm)	–	1	–	4	5
Level 18 (300–310 cm)	–	1	54	–	55
Level 20 (320–330 cm)	–	–	–	4	4
Level 21 (330–340 cm)	–	–	–	1	1
Level 22 (340–350 cm)	–	–	–	1	1
Subtotals	0	6	54	19	79
TOTALS	1	25	114	44	184

* Nine pieces of debitage and 21 of the 27 bones were recovered from flotation processing.

INVERTEBRATE FAUNAL REMAINS

Thirty of the 44 mussel shells could be identified taxonomically (see Appendix B). The taxa include *Amblema plicata*, *Cyrtonaias tampicoensis*, *Leptodea fragilis*, *Quadrula petrina*, *Quadrula* sp., and *Tritogonia verrucosa*. The species *A. plicata* (threeridge mussel) is the most common taxon identified.

VERTEBRATE FAUNAL REMAINS

Bone preservation at 41ML160 is good. All 114 bone specimens are from Test Units 3 and

4; of these, 93 were analyzed (see Appendix C). The remaining 21 bone fragments were retrieved during flotation processing. While none were included in the taxonomic analysis, general observations were made. The specimens range in size from 0.5 to 3.0 cm, and 11 of the 21 are burned.

Although no species are identifiable in the vertebrate assemblage, 7 specimens were identified as Artiodactyla (medium- or goat/deer-sized). The remaining fragments are medium-sized to large (canid/deer-sized) Mammalia (n = 75) or Vertebrata (n = 11). Thirteen percent (n = 12) of the specimens are charred or calcined. Based on the quantity of medium to large mammal remains, it is likely that most of the faunal assemblage is made up of deer.

OTHER MATERIALS

Approximately 15 burned rocks were observed during hand excavations. Test Units 1 and 2 encountered ca. 4 small rocks, which in total weighed less than 1 kg. Test Units 3 and 4 contained ca. 11 burned rocks; these rocks collectively weighed ca. 2 kg. Two of the rocks were found in situ within Feature 1.

Chronology and Components

One component is defined at the site by a small group of artifacts and a feature. The exact age of the component is unknown, since no diagnostics were recovered and the carbon submitted for dating was too small. The component is estimated to date to the early half of the Late Archaic period because the associated artifacts and feature occur between 260 and 330 cm in late Holocene alluvium.

The 70-cm-thick cultural zone yielded 26 chipped stone artifacts, 29 invertebrate faunal specimens, 114 vertebrate faunal remains, and Feature 1 (an unprepared heating/cooking surface). Based on analysis of the materials recovered, little interpretation of behaviors or activities during site occupation can be drawn. It does appear, however, that late bifacial reduction activities were performed, as evidenced by the sparseness of flakes with cortex. Furthermore, tool resharpening or expedient tool usage is suggested by the recovery of small pieces of debitage from Feature 1. Finally, with the recovery of numerous possible deer bone fragments both in and around Feature 1, it appears that activities such as large game processing and cooking took place. Site 41ML160, therefore, may represent a short-term, specialized activity site (i.e., hunting camp).

Summary and Assessment

Site 41ML160 is a deeply buried prehistoric site situated on the east bank of the North Bosque River. A total of 184 cultural materials—lithics, bones, and mussel shells—were collected. One hearth feature was encountered. Unfortunately, carbonized materials are sparse. While cultural materials are sparse, the site does appear to have a discrete occupation with good contextual integrity, probably dating to the early part of the Late Archaic period. Organic materials, particularly faunal remains, are well preserved. Based on these factors, it is believed the site has the potential to yield important data and should be considered eligible for National Register listing.

Site 41ML162

Description

Site 41ML162 is a multicomponent prehistoric site with stratified cultural deposits. It is situated in Holocene alluvial and colluvial deposits ca. 85 m south of the south bank of the North Bosque River arm of the lake (see Figure 4). The Holocene terrace surface rises from an elevation of ca. 458 ft along the lakeshore to ca. 470 ft on a rise at the southern valley wall, where colluvium from the adjacent slopes to the south appears to be present. Two intermittent tributaries to the North Bosque mark the western and eastern boundaries of the site. A moderately dense forest of oak, elm, pecan, and hackberry trees covers the site area, in addition to a thick understory of greenbriers and poison oaks.

Previous Investigations

Site 41ML162 was recorded and tested in 1984 (Prikryl and Jackson 1985:82–87, 211–213). Cultural materials noted on the surface included sparse burned rocks, mussel shells, and debitage exposed in animal burrows and tree throws. Subsurface investigations consisted of

three shovel tests and a single 1x2-m test pit. Shovel Test 1, excavated to 35 cm, was on the rise near the base of the upland slope. The sediments consisted of dark brown organically stained clay loam containing midden deposits with burned rocks, mussel shells, charcoal, bones, and a conch columella shell bead. Shovel Test 2 was ca. 10 m north of Shovel Test 1, closer to the river but still on the rise at the base of the upland slope. The first 30 cm of this test contained sterile clay loam. Below this to a depth of at least 60 cm were midden deposits similar to those in the first test. The third test was ca. 10 m farther downslope, on the Holocene terrace proper. The test was excavated through 40 cm of culturally sterile clay loam into a limestone gravel deposit at least 15 m thick.

Because no cutbanks were available for inspection, a test pit was excavated to explore the possibility of deeply buried components. This unit was 8–10 m west of Shovel Tests 2 and 3. The northern half was dug to a depth of 150 cm, while the southern half reached a depth of 210 cm. It was removed in 30-cm levels, with 25–75 percent of the fill screened to recover cultural materials.

Nine stratigraphic zones were identified, with the density of cultural debris being greatest in Zone 6 (for a more-detailed presentation of the stratigraphy, see Prikryl and Jackson [1985:82–87, 211–213]). The cultural deposit in Zone 6 contained burned rocks, mussel shells, bones, chipped stone debitage and tools, burned clay, charcoal, and two Late Archaic diagnostics (a Marcos dart point and an Erath biface). Part of this deposit, recorded as Zone 6a, consisted of a concentration of burned rocks along with a very high density of mussel shells, bones, charcoal, and debitage; it was interpreted as the edge of a midden or hearth area.

Site 41ML162 was revisited in 1999 as part of a site re-location and reassessment effort (Kvernes et al. 2000:55–56). The small inlet recorded in 1984 as the western boundary of the site was easily re-located, as was a fence line near the eastern edge of the site. Surface visibility was extremely poor, and poison oaks, fallen trees, and leaf litter made surface inspection for cultural materials impossible. Two shovel tests were excavated at the southern end of the site on the rise at the base of the upland slope between elevations of ca. 460 and 470 ft. Shovel Test 99-1 was excavated in 20-cm levels to a depth of 40 cm. Level 1, composed of a dark brown clay loam with 2-cm-diameter limestone rocks, produced only mussel shell fragments. Level 2 yielded a similar soil type and quantities of mussel shell fragments, but larger limestone cobbles (>6 cm) were noted at a depth of 35 to 40 cm. Shovel Test 99-2 also was excavated to 40 cm; it produced several pieces of burned limestone and a few mussel shell fragments. The soil was a dark brown clay loam.

Work Accomplished

In the previous investigations of 1984, a nail was set in the base of a bois d'arc tree located in the north-central part of the site. The secondary datum (rebar) for the 2000–2001 investigations was placed near that same tree. The primary datum (rebar) was given an arbitrary elevation of 100.00 m and placed near the center of the investigation area, about 10 m northwest of Trench 3 and 10 m southeast of Test Units 1 and 5.

Four trackhoe trenches were excavated to examine the colluvial toeslope, as well as the alluvial terrace deposits away from the base of the slope (Figure 21). In the central part of the site, Trench 1 was placed about 10 m northwest of the secondary datum on the alluvial terrace at an orientation of 60°. The trench measured 2.8x2.6x1.8 m and encountered both colluvial and alluvial deposits. This trench exemplified the interdigitation of late Holocene alluvium with the colluvial gravels from upslope. The colluvial gravels appeared to contain fragments of burned rocks.

Trench 2, aligned at 44°, was 45 m southeast of Trench 1. It measured 2.1x1.4x1.5 m and encountered either bedrock or compact colluvial gravels near the base. Between 20 and 100 cm, a few mussel shells, burned rocks, and charcoal flecks were observed. Trench 3 was situated 20 m southwest of Trench 2 and yielded similar results. From 19 to 93 cm, burned rocks and a few mussel shell fragments were observed. The trench measured 2.7x1.7x1.5 m and encountered either bedrock or compact colluvial gravels.

Trench 4 examined the western part of the investigation area. Situated 21 m south of Trench 1 and 27 m west of Trench 3, the trench measured 2.8x1.7x1.8 m and was oriented at 322°. The trench revealed well-strati-

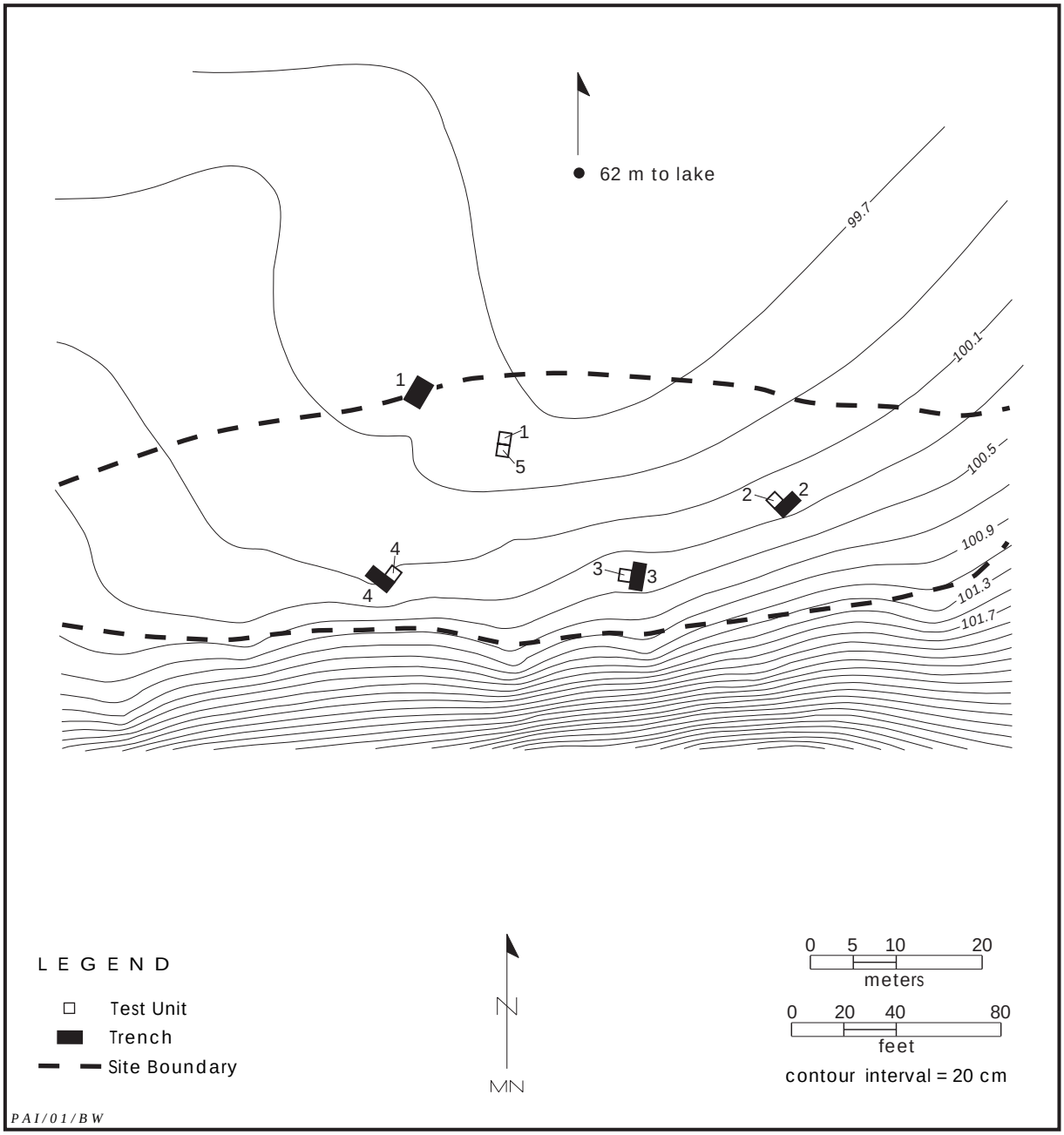

Figure 21. Map of 41ML162.

fied buried A horizons with cultural materials (e.g., mussel shells, burned rocks) at 18–77 cm, 105–127 cm, and 153–180 cm. The deeper half of the trench contained more colluvial gravels than the upper portion. Two bulk sediment samples for radiocarbon dating were collected from the wall at 50–60 cm and 107–117 cm.

Five test units were excavated. Two were near the bois d'arc tree while the remaining three were adjacent to trenches. All of the units were excavated from the modern ground surface. All of the excavations were terminated when the water table was encountered or, in the case of Test Unit 1, when colluvial gravels were reached just above the water table. Because of

the elevated water table, the anticipated target depth of 210 cm was not reached.

Test Unit 1 was set up in the area of the 1x2-m unit excavated in 1984, east of the datum tree. Excavation finished at Level 15 (150 cm). Test Unit 2 was placed on the west side of Trench 2. The water table was hit at Level 19 (190 cm). Test Unit 3 was on the west side of Trench 3. In this unit, the water table was encountered at 150 cm. Test Unit 4 was set up on the east side of Trench 4. Eighteen levels were completed when the water table was encountered at 180 cm. Finally, Test Unit 5 was placed on the south side of Test Unit 1 forming a 1x2-m test pit. Excavation in this unit stopped at Level 14 (140 cm) because of the high water table. In total, 8.1 m^3 were hand excavated.

Site Extent and Depth

Previous investigations at 41ML162 measured the size of the site at ca. 160 by 50 m, based on the distribution of surface artifacts (Prikryl and Jackson 1985:82–87, 211–213). These investigations also noted cultural materials (burned rocks, debitage, and mussel shells) to a depth of 210 cm in a 1x2-m test pit. Subsequent investigations noted heavy vegetation and large amounts of flood debris that obscured the surface, limiting observations about the site extent (Kvernes et al. 2000:56). Similarly, no surface artifacts were observed during the current investigations, and no new information on the east-west extent of the site was obtained. However, cultural materials were found in all of the excavations except for Trench 1, suggesting that the site extends only ca. 30 m north-south from the toeslope out onto the terrace. Within most test units, artifacts and other cultural materials, though small in number, were recovered as deep as 150–180 cm when excavations were stopped at the water table; thus, the full depth of the site is not known.

Sediments and Stratigraphy

The sediments and stratigraphy at 41ML162 were examined through the profiles of five trenches and descriptions of the soil stratigraphy of three trench profiles (see Appendix A). The site is located on the toeslope and terrace of the North Bosque River valley. Prior to the creation of Waco Lake, the terrace surface at this locality stood ca. 4–5 m above the North Bosque channel. Soils on the terrace surface belong to the Catalpa series (Templin et al. 1958). Catalpa soils are calcareous grayish brown to dark grayish brown clay loam to clayey soils formed on recent alluvium. Tarrant soils mantle the surface of the toeslope and are dark calcareous stony clay soils.

Due to the site's proximity to the valley wall, the deposits that underlie the surface are a mix of late Holocene alluvium and colluvium (Figure 22). A thin deposit of recent alluvium blankets much of the terrace surface. This deposit, designated an AC horizon, ranges in thickness from 18 cm in Trench 4 to 36 cm in Trench 1 and is composed of grayish brown to dark grayish brown to dark gray silty clay loam with some preserved horizontal structures. The 141-cm-thick profile of Trench 1 best displays the interfingering of alluvium and colluvium. Below the recent alluvial mantle is a buried soil (Ab horizon, 36–52 cm) consisting of dark gray silty clay loam alluvium with 10 percent limestone gravels. The Ab horizon overlies a series of Bw horizons (52–116 cm) imprinted on interfingered deposits of alluvium and colluvium. The alluvial deposits pinch out to the south (toward the valley wall), while the colluvial deposits pinch out to the north (toward the North Bosque channel). The alluvial deposits typically are dark grayish brown silty clay loams, while the colluvial deposits consist of dark grayish brown gravelly sandy clay loams with angular to subrounded, granule- to pebble-sized gravels. The basal deposit (116–141+ cm) is a dark grayish brown gravelly sandy clay loam and is designated a C horizon.

Deposits at the toeslope were observed in Trench 3. The deposits below the recent alluvial cap are a mix of alluvium, colluvium, and deposits of anthropogenic origin. These are imprinted with an Ab-Bwb soil profile. The Ab horizon (19–93 cm) is formed on a black silty clay loam with 5 percent limestone gravels. Burned rocks are common throughout the horizon suggesting that the deposit on which the Ab horizon has formed also contains an anthropogenic component. The Ab horizon grades into the Bwb horizon (93–143+ cm), a yellowish brown silty clay with 2 percent limestone gravels.

The profile of Trench 4 also consists of a mix of alluvial and colluvial deposits below the recent alluvial veneer, but the profile displays

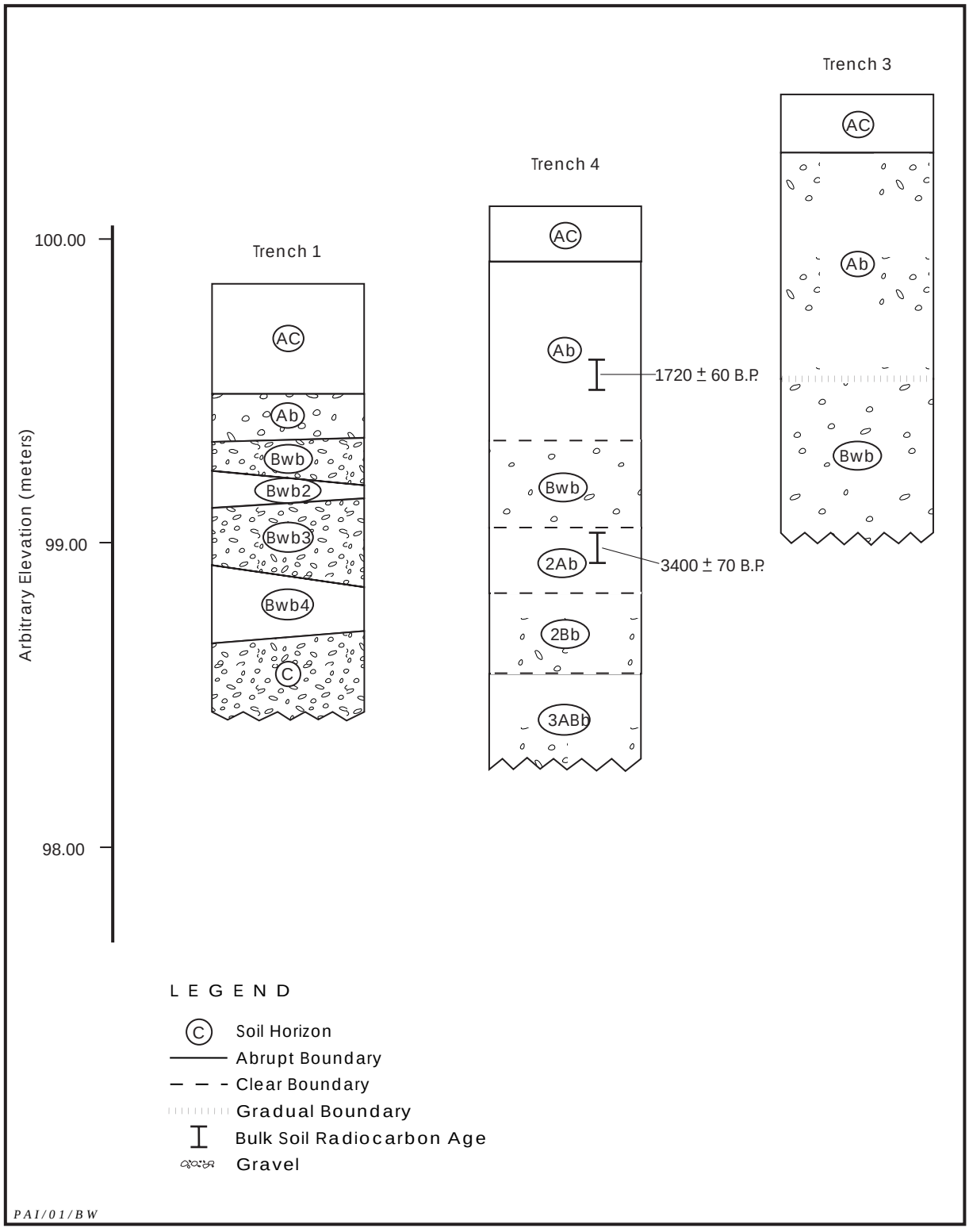

Figure 22. Profiles of Trenches 1, 4, and 3, 41ML162.

multiple buried soils. The trench exhibits an Ab-Bwb-2Ab-2Bb-3ABb soil profile. The Ab horizon (18–77 cm) is a very dark gray silty clay loam with common freshwater mussel shell fragments and burned rocks. A bulk soil sample collected from 50 to 60 cm yielded a conventional radiocarbon age of 1720 ± 60 B.P. (Beta-154293). The Bwb horizon (77–105 cm) is a dark grayish brown clay loam with 2 percent limestone gravels. The second buried soil (2Ab horizon at 105–127 cm) consists of a very dark grayish brown clay loam with many burned rocks, common freshwater mussel shells, and a few pieces of charcoal. A bulk soil sample collected from 107 to 117 cm produced a conventional radiocarbon age of 3400 ± 70 B.P. (Beta-154294). The accompanying 2Bb horizon (127–153 cm) is a brown silty clay loam with 5 percent limestone gravels. The third buried soil (3ABb horizon at 153–180+ cm) consists of a dark grayish brown silty clay loam with 10 percent limestone gravels. Freshwater mussel shells are common throughout the soil. General observations of the profile revealed that the frequencies of burned rocks, freshwater mussel shells, and charcoal peak strongly within the buried A horizons, clearly indicating that the terrace/floodplain surface was only occupied during periods of surface stability. The multiple soils were observed throughout the western part of the area investigated, suggesting that this part of the site witnessed more intervals of stability or lacunae in deposition than the area to the east, where only a single A horizon (observed in Trenches 2 and 3) has formed atop alluvial and colluvial deposits.

Cultural Features

Two features were encountered during the test excavations. Both are burned rock features.

FEATURE 1

Feature 1, a buried burned rock midden, was discovered in Test Unit 3, Levels 5–10 (40–100 cm) (Figure 23). The midden covered the entire test unit, and, therefore, the feature's full dimensions and morphology are unknown. Its maximum thickness is ca. 60 cm. No internal features were observed during excavation, though a few rocks appeared to be broken in place. While a large amount of rocks was found in Level 10 (90–100 cm), there was no pattern to the rocks to suggest that they represent a prepared base for a large hearth. No oxidized soil, charcoal, or ash was found in situ in the feature. Charcoal recovered from Level 6 (50–60 cm) was identified as oak (*Quercus* sp.). This specimen was later submitted for radiocarbon dating and yielded a radiocarbon age of 1980 ± 60 B.P. (Beta-154279).

Feature contents from the test unit consist of 395 burned rocks (81 kg), including 50 rocks 10 cm in size or greater, 120 rocks 5–10 cm in size, and 225 less than 5 cm. Two dart points, 9 lithic tools, 229 pieces of debitage, 1 piece of pottery, 1 piece of burned clay, 37 pieces of bone, and 114 mussel shell fragments were collected.

About 4.5 liters of feature fill from Level 5 (40–50 cm) were collected for flotation. Flotation processing recovered ca. 0.4 kg of burned rocks, 18 pieces of lithic debitage, 18 pieces of bone, charred wood remains, and numerous fragments of snail and mussel shells (see Materials Recovered). Four mussel shell umbos recovered from flotation were included in the invertebrate faunal analysis. The bone specimens were not incorporated into the vertebrate faunal analysis. They vary in size from less than 0.5 cm to 2.0 cm, and only one of the specimens is charred. Small to medium-sized vertebrates are represented.

Feature 1 represents the accumulation of burned rocks from hearths and baking features. While no internal features were observed during excavation, they may exist elsewhere in the midden. The development of the midden suggests repeated occupations focused on the same or similar cooking and processing activities over time.

FEATURE 2

Feature 2 represents a discrete, single-layered cluster of burned rocks. It was first exposed in the northeast wall of Trench 4 and subsequently partially exposed during excavation of Test Unit 4. Found in Levels 7 and 8 (62–75 cm) at the base of the Ab horizon, Feature 2 is located in the west corner of the unit (Figure 24). In plan, the exposed portion resembles part of an oval and measures 49 cm northeast-southwest by 27 cm northwest-southeast. It is composed of ca. 7 kg of burned rocks (4 rocks greater than 10 cm in size, 17 rocks 5–10 cm in size, and 25 rocks less than 5 cm in size). The larger

Figure 23. Photograph of the top of Feature 1, 41ML162.

rocks, some of which are fractured in place, are toward the perimeter of the feature. In cross section the feature is basin shaped with rocks tilting slightly toward the center. While pieces of charcoal and charcoal flecking were observed, no oxidized sediment or ash was present. Two pieces of charcoal collected from the feature were submitted for radiocarbon dating. The first sample collected at 69 cm yielded a radiocarbon age of 2830 ± 40 B.P. (Beta-154280). The second sample collected at 72 cm produced a radiocarbon age of 2780 ± 40 B.P. (Beta-154281).

Approximately 4.5 liters of feature fill were collected for flotation. Flotation processing recovered 0.2 kg of burned rocks, seven pieces of lithic debitage, seven bone fragments, charcoal, and snail and mussel shell fragments. None of the mussel shell or bone fragments were included in the faunal analyses. The bone fragments are small (<1 cm), and only one specimen appears to be charred.

Feature 2 appears to have functioned as a cooking or baking pit. The basin-shaped cross section and rocks tilting toward the center suggest that a prepared surface was constructed on which a layer of rocks was placed. The feature probably was utilized to process and cook game as evidenced by the recovery of vertebrate faunal remains, some of which are charred. Radiocarbon dates suggest it was utilized during the early part of the Late Archaic period.

Materials Recovered

Test excavations at 41ML162 recovered 1,193 chipped stone artifacts; 820 invertebrate faunal remains; 261 vertebrate faunal remains; 1 piece of pottery; 4 ground, pecked, and battered stone tools; 1.0 kg of burned clay lumps; and numerous burned rocks. Provenience data for all of the materials recovered (except for the burned clay lumps and rocks) are summarized in Table 4.

CHIPPED STONE ARTIFACTS

The 1,193 chipped stone artifacts consist of 1 arrow point, 9 dart points, 22 bifaces, 7 unifaces,

Figure 24. Photograph of Feature 2, 41ML162.

6 cores, 1 cobble tool, 41 pieces of edge-modified debitage, and 1,106 pieces of unmodified debitage.

Arrow Point

One specimen is classified as a Perdiz arrow point (Turner and Hester 1993:227) (Figure 25a). The point is complete, retains its barbs and tapered tip, and is bifacially flaked. The stem is contracting with a gentle convex base. The material is an opaque brown chert. Provenience and metric data are presented in Table 5.

Dart Points

Darl

One specimen is identified as a Darl (Turner and Hester 1993:101) (Figure 25b). The dart point has an almost parallel-sided blade that is slightly beveled and serrated on one edge. The shoulders are weak, and the stem is straight with a slight bevel and lightly ground edges. The base is straight to slightly convex with no basal grinding. The material is a reddish brown chert.

Ellis

Three dart points are classified as Ellis (Turner and Hester 1993:113). The first specimen is a reworked Ellis point with a triangular blade (Figure 25c). The shoulders are weak, and the stem is expanding. A portion of the base has been removed with a single blow to one corner, resulting in the removal of a tiny narrow flake from the basal edge. This basal modification also is applied to the two other Ellis points. The material is a speckled brown and tan chert that shows evidence of heat treatment through discoloration.

The second specimen has a long, slender triangular blade with serrated edges (Figure 25d). The shoulders are moderate, and the stem and base are highly modified. As with the first Ellis point, a portion of the base is missing. The material is a light tan chert with white speckled inclusions.

Table 4. Summary of cultural materials from 41ML162

Provenience	Arrow Point	Dart Points	Bifaces	Unifaces	Cores	Cobble Tool	Edge-modified Debitage	Unmodified Debitage	Pottery	Ground/Pecked/ Battered Stone Tools	Unmodified Mussel Shells	Unmodified Bones	Totals
TEST UNIT 1													
Level 4 (30–40 cm)	–	–	–	–	–	–	–	–	–	–	–	1	1
Level 5 (40–50 cm)	–	–	–	–	–	–	–	–	–	–	3	–	3
Level 6 (50–60 cm)	–	–	–	–	–	–	–	1	–	–	2	–	3
Level 7 (60–70 cm)	–	–	–	–	–	–	–	2	–	–	1	18	21
Level 8 (70–80 cm)	–	–	–	–	–	–	1	2	–	–	4	–	7
Level 9 (80–90 cm)	–	–	–	–	–	–	–	2	–	–	4	–	6
Level 10 (90–100 cm)	–	–	–	–	–	–	1	8	–	–	8	1	18
Level 11 (100–110 cm)	–	–	1	1	1	–	1	19	–	1	17	1	42
Level 12 (110–120 cm)	–	–	–	–	–	–	1	16	–	–	3	1	21
Level 13 (120–130 cm)	–	–	–	–	–	–	–	12	–	–	1	1	14
Level 14 (130–140 cm)	–	–	–	–	–	–	–	3	–	–	3	–	6
Level 15 (140–150 cm)	–	–	–	–	–	–	–	1	–	–	1	–	2
Subtotals	0	0	1	1	1	0	4	66	0	1	47	23	144
TEST UNIT 2													
Level 3 (20–30 cm)	1	–	3	–	–	–	–	8	–	–	5	27	44
Level 4 (30–40 cm)	–	3	3	1	1	–	6	220	–		57	42	333
Level 5 (40–50 cm)	–	1	4	1	–	–	6	96	–	1	55	26	190
Level 6 (50–60 cm)	–	–	–	–	–	–	1	4	–		4	1	10
Level 8 (70–80 cm)	–	–	–	1	–	–	–	2	–	–	1	–	4
Level 9 (80–90 cm)	–	–	–	–	1	–	–	6	–	–	–	–	7
Level 10 (90–100 cm)	–	–	–	–	–	–	–	1	–	–	2	–	3
Level 12 (110–120 cm)	–	–	–	–	–	–	–	1	–	–	1	–	2
Level 14 (130–140 cm)	–	–	–	–	–	–	–	1	–	–	3	–	4
Level 15 (140–150 cm)	–	–	–	–	–	–	–	1	–	–	–	–	1
Subtotals	1	4	10	3	2	0	13	340	0	1	128	96	598
TEST UNIT 3													
Level 3 (20–30 cm)	–	–	2	–	–	–	–	9	–	–	134	7	152
Level 4 (30–40 cm)	–	1	–	1	–	–	2	29	–	2	30	8	73
Feature 1 (40–50 cm)	–	–	–	–	–	–	1	45	–	–	34	32	112
Feature 1 (50–60 cm)	–	1	–	–	1	–	–	27	–	–	12	10	51
Feature 1 (60–70 cm)	–	–	2	–	–	–	–	23	1	–	34	8	68
Feature 1 (70–80 cm)	–	1	1	–	–	–	3	53	–	–	28	4	90
Feature 1 (80–90 cm)	–	–	–	–	–	–	1	77	–	–	6	2	86
Feature 1 (90–100 cm)	–	–	–	–	–	–	–	22	–	–	4	–	26
Level 11 (100–110 cm)	–	–	–	–	–	–	–	5	–	–	2	–	7
Level 12 (110–120 cm)	–	–	–	–	–	–	–	–	–	–	1	–	1
Subtotals	0	3	5	1	1	0	7	290	1	2	285	71	666
TEST UNIT 4													
Level 3 (20–30 cm)	–	–	–	–	–	–	–	–	–	–	1	–	1
Level 4 (30–40 cm)	–	–	1	–	–	–	1	17	–	–	13	6	38
Level 5 (40–50 cm)	–	–	1	–	–	–	2	63	–	–	33	13	112
Level 6 (50–60 cm)	–	–	2	–	–	–	3	108	–	–	29	6	148
Level 7 (60–70 cm)	–	–	–	1	–	–	2	75	–	–	54	4	136
Feature 2 (65–72 cm)	–	–	–	–	–	–	–	7	–	–	–	7	14

Table 4, continued

Provenience	Arrow Point	Dart Points	Bifaces	Unifaces	Cores	Cobble Tool	Edge-modified Debitage	Unmodified Debitage	Pottery	Ground/Pecked/ Battered Stone Tools	Unmodified Mussel Shells	Unmodified Bones	Totals
Level 8 (70–80 cm)	–	–	–	–	–	–	–	1	–	–	1	–	2
Level 9 (80–90 cm)	–	–	–	–	–	1	1	–	–	–	5	–	7
Level 10 (90–100 cm)	–	–	–	–	–	–	–	7	–	–	5	3	15
Level 11 (100–110 cm)	–	–	–	1	–	–	1	28	–	–	26	–	56
Level 12 (110–120 cm)	–	–	1	–	2	–	–	12	–	–	31	1	47
Level 13 (120–130 cm)	–	–	–	–	–	–	–	5	–	–	15	–	20
Level 14 (130–140 cm)	–	–	–	–	–	–	–	7	–	–	14	12	33
Level 15 (140–150 cm)	–	–	–	–	–	–	1	25	–	–	14	–	40
Level 16 (150–160 cm)	–	–	–	–	–	–	1	17	–	–	24	3	45
Level 17 (160–170 cm)	–	–	–	–	–	–	1	5	–	–	14	2	22
Level 18 (170–180 cm)	–	1	–	–	–	–	1	7	–	–	22	6	37
Subtotals	0	1	5	2	2	1	14	384	0	0	301	63	773
TEST UNIT 5													
Level 4 (30–40 cm)	–	–	–	–	–	–	–	–	–	–	–	2	2
Level 5 (40–50 cm)	–	–	–	–	–	–	–	4	–	–	3	2	9
Level 6 (50–60 cm)	–	–	–	–	–	–	–	1	–	–	6	1	8
Level 7 (60–70 cm)	–	–	–	–	–	–	–	–	–	–	2	1	3
Level 8 (70–80 cm)	–	–	–	–	–	–	1	4	–	–	1	–	6
Level 9 (80–90 cm)	–	1	–	–	–	–	2	4	–	–	34	2	43
Level 10 (90–100 cm)	–	–	–	–	–	–	–	7	–	–	9	–	16
Level 11 (100–110 cm)	–	–	–	–	–	–	–	2	–	–	4	–	6
Level 12 (110–120 cm)	–	–	1	–	–	–	–	4	–	–	–	–	5
Subtotals	0	1	1	0	0	0	3	26	0	0	59	8	98
TOTALS	1	9	22	7	6	1	41	1,106	1	4	820	261	2,279

The third point has a triangular blade with serrated edges (Figure 25e). The shoulders are moderate to strong. The specimen displays the remnants of an expanding stem. The material is a dark gray to black chert with lighter colored inclusions. As with the previous specimens, the base is modified with evidence of two strikes to one corner to remove part of it. The result is a thick convex base. This may have been done to dull the base, a technique akin to basal grinding to prevent cutting or splitting the hafting material or shaft.

Ensor

One specimen is identified as an Ensor point (Turner and Hester 1993:114) (Figure 25f). The point has a triangular blade that displays alternately beveled edges and reworking. The shoulders are moderately abrupt with some shallow side notching. The stem is expanding, and the base is straight. One ear or basal corner is missing. The material is a light brown/tan chert with lighter colored mottles.

Marcos

One specimen is classified as a Marcos (Turner and Hester 1993:147–148) (Figure 25g). This proximal fragment displays the remnants of a broad, long, slightly triangular blade. The deep, inward corner notching results in abrupt barbed shoulders and an expanding stem with a straight base.

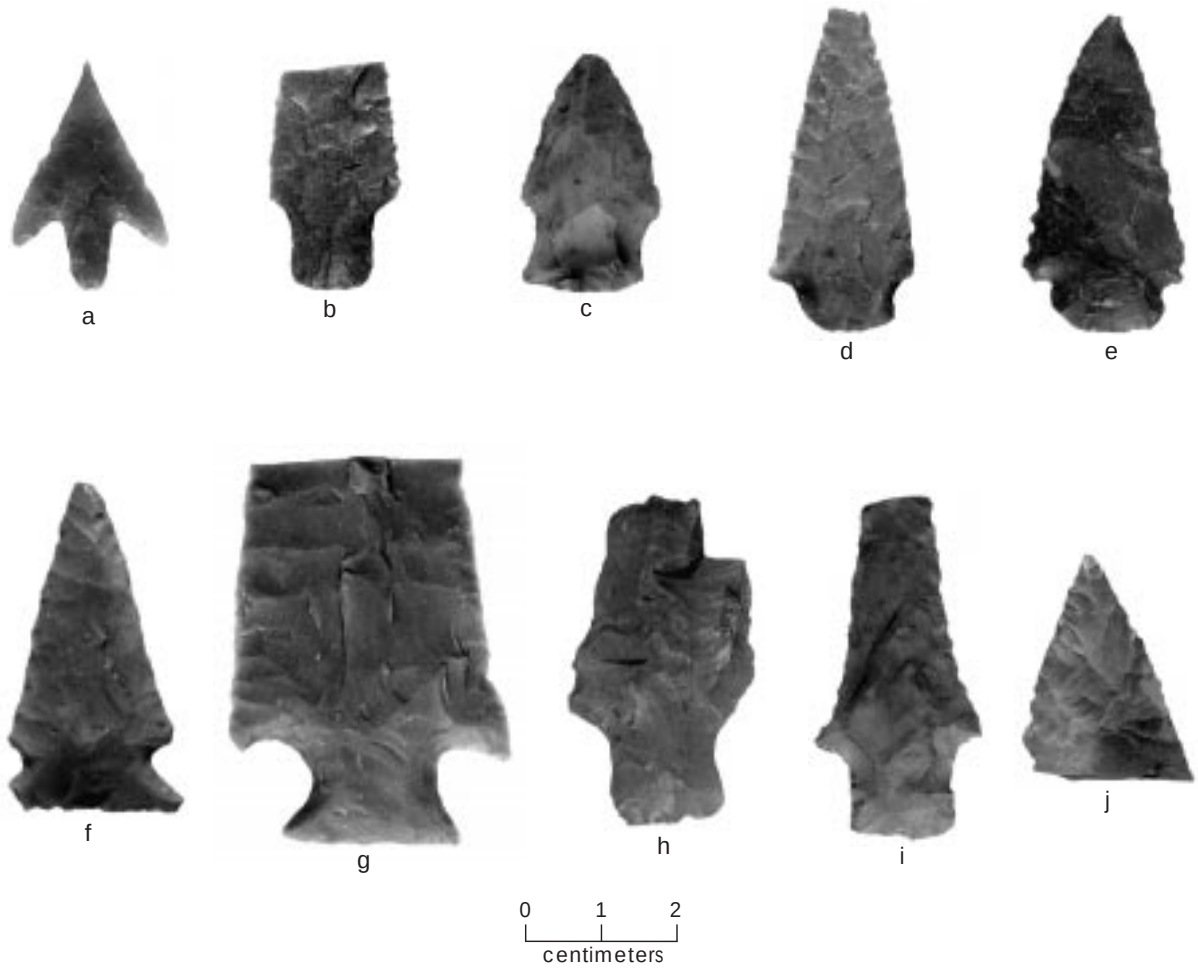

Figure 25. Projectile points from 41ML162. (a) Perdiz; (b) Darl; (c–e) Ellis; (f) Ensor; (g) Marcos; (h) Provisional Type 1 dart point; (i–j) untyped dart points.

Provisional Type 1

One specimen does not fall into a traditionally defined type (Figure 25h). The point has a reworked blade, which is broken. The shoulders are weak, and the slightly expanding stem has light to heavy edge grinding. The base is gently convex and not ground. The material is a light gray chert with lighter and darker colored inclusions.

This point closely resembles those specimens from Fort Hood and other areas in central Texas referred to by Kleinbach et al. (1999:335–344) as Provisional Type 1. Provisional Type 1 is best described as a point with straight to slightly convex blade margins, weak to strong shoulders (without barbs), a rectangular to slightly expanding stem with straight to subtle concave edges, and a straight to slightly convex base (Kleinbach et al. 1999:335). Radiocarbon dates associated with Provisional Type 1 points from Fort Hood range from 2400–2205 B.C. to <3335–3070 B.C. Kleinbach et al. (1999:337) suggest these points were utilized around 3000–2000 B.C. Although there are no radiocarbon ages directly associated with the specimen recovered from 41ML162, it is from a context that is consistent with the 3000–2000 B.C. time span proposed by Kleinbach et al. (1999). The specimen, recovered from the 3ABb horizon at 170–180 cm in Test Unit 4, underlies two charcoal samples from 127 cm and 110–120 cm (2Ab horizon) that produced radiocarbon ages of

Table 5. Provenience and metric data for projectile points from 41ML162

Provenience	Point Type	Tool Completeness	Maximum Length	Maximum Blade Width	Haft Length	Neck Width	Base Width	Maximum Thickness
TEST UNIT 2								
Level 3 (20–30 cm)	Perdiz	intact	30.5	20.5	9.2	6.4	5.0	2.7
Level 4 (30–40 cm)	Darl	proximal	–	17.3	7.1	10.9	9.8	5.2
Level 4 (30–40 cm)	Ellis	intact/nearly complete	–	18.3	6.3	13.8	15.7	5.7
Level 4 (30–40 cm)	Marcos	proximal	–	37.1	10.1	16.2	23.4	8.0
Level 5 (40–50 cm)	Untyped Dart	proximal	–	21.9	8.4	13.6	13.6	6.9
TEST UNIT 3								
Level 4 (30–40 cm)	Ellis	intact/nearly complete	–	19.4	–	12.4	–	5.1
Feature 1 (50–60 cm)	Ellis	intact/nearly complete	–	20.8	–	14.1	–	6.0
Feature 1 (70–80 cm)	Untyped Dart	distal	–	–	–	–	–	5.5
TEST UNIT 4								
Level 18 (170–180 cm)	Provisional Type 1	proximal	–	24.3	10.9	13.6	13.9	8.3
TEST UNIT 5								
Level 9 (80–90 cm)	Ensor	intact	42.7	21.4	5.7	16.5	–	6.1

Note: All measurements are in millimeters.

3490 ± 40 B.P. (Beta-154292) and 3600 ± 40 B.P. (Beta-154282), respectively. The two-sigma calibrated date ranges for these two radiocarbon ages are 3860 (3720) 3650 B.P. and 3990 (3900) 3830 B.P., or 1910–1700 B.C. and 2040–1880 B.C., respectively.

Untyped

Two points could not be typed (Figure 25i–j). The first specimen is a proximal fragment with the remnants of a substantially reworked blade. The blade is slender with slightly beveled, concave edges and strong shoulders. The shoulders may have been barbed at one point in time. The stem is straight with no edge grinding. The base is modified from having a portion removed, similar to the previously mentioned Ellis points. The material is a mottled brown chert.

The second specimen is a distal point tip. The remaining portion of the blade is a triangular specimen with some reworking on the edge. The material is brown chert with light tan mottles.

Bifaces

Twenty-two bifaces, mostly fragments, were recovered from 41ML162. Provenience and metric data are provided in Table 6.

Six specimens (27 percent) are intact or nearly complete specimens. The remaining 16 (73 percent) are fragmentary. Early stage of reduction accounts for 50 percent (n = 11) of the specimens. The remainder represent middle (n = 1), late (n = 5), and finished stage (n = 4) bifaces, while 1 specimen is considered indeterminate in terms of reduction stage. Tool types consist of 2 knives (Figure 26a), 3 adzes (Figure 26b–c), 1 scraper, 1 graver, and 15 indeterminate bifaces (Figure 26d).

Unifaces

Seven unifaces were identified. Provenience and metric data are summarized in Table 7. Just under half (43 percent, n = 3) are intact or nearly complete artifacts. Most (n = 4) are scraping tools, including end and end/side scrapers (Figure 26e). Two spokeshaves and 1 knife also are represented. Cortex is present on 71 percent (n = 5) of the assemblage.

Cores

Six cores were recovered. Provenience and metric data are presented in Table 8. All have more than three flake scars, and most (n = 4) display multiple directions of flake removal. The chert materials vary in color from brown to light and very dark gray.

Cobble Tool

One cobble tool was found in Test Unit 4, Level 9 (80–90 cm). The tool is an intact wedge with use wear on one of its margins. Much of the nonworking edge of the tool is covered with cortex. The specimen measures 62.4 mm x 61.5 mm, and it is 22.8 mm thick. The tool is made of a light tan chert.

Edge-modified Debitage

Forty-one pieces of edge-modified debitage were identified. Nineteen (46 percent) are complete flakes, 14 (34 percent) are proximal fragments, 7 (17 percent) are chips, and 1 (3 percent) specimen is a chunk. Twenty-six specimens (63 percent) have cortex on their dorsal surfaces. Most of the debitage (n = 21) has one modified edge, and 18 specimens have two modified edges. The remaining 2 pieces show three worked edges.

None of the specimens are smaller than 2 cm in size, and the largest piece is 6–7 cm. The two edge-modified flakes with three working edges are 2–3 cm in size. Overall, 44 percent (n = 18) are 2–3 cm in size, and 34 percent (n = 14) are 3–4 cm. The remaining 22 percent (n = 9) are 4–7 cm. Raw material colors range from light brownish gray—the material used most frequently—to light and dark gray cherts.

Unmodified Debitage

A total of 1,106 pieces of unmodified debitage were recovered. Of those flakes, 249 (23 percent) are complete, 392 (35 percent) are proximal fragments, 373 (34 percent) are chips, and 92 (8 percent) are chunks. Cortex is absent on 59 percent (n = 652) of the assemblage. Only 18 flakes (<2 percent) have 100 percent dorsal cortex. The unmodified debitage ranges in size from less than 1 to 6 cm. The 1–2-cm size class

Table 6. Provenience and metric data for bifaces from 41ML162

Provenience	Tool Type	Completeness	Stage of Reduction	Length	Width	Thickness
TEST UNIT 1						
Level 11 (100–110 cm)	knife	distal	finished	–	–	5.7
TEST UNIT 2						
Level 3 (20–30 cm)	indeterminate	edge	late	–	–	6.5
Level 3 (20–30 cm)	indeterminate	medial	finished	–	36.7	7.2
Level 3 (20–30 cm)	indeterminate	edge	early	–	–	–
Level 4 (30–40 cm)	indeterminate	distal	early	–	25.3	16.3
Level 4 (30–40 cm)	indeterminate	medial	late	–	–	4.1
Level 4 (30–40 cm)	indeterminate	wedge	late	–	–	9.9
Level 5 (40–50 cm)	scraper	intact/nearly complete	early	55.7	42.0	13.5
Level 5 (40–50 cm)	adze	intact/nearly complete	early	66.4	43.8	18.3
Level 5 (40–50 cm)	indeterminate	intact/nearly complete	early	48.5	39.0	16.5
Level 5 (40–50 cm)	knife	proximal	finished	–	32.2	5.9
TEST UNIT 3						
Level 3 (20–30 cm)	indeterminate	edge	indeterminate	–	–	4.7
Level 3 (20–30 cm)	indeterminate	medial	early	–	39.1	7.6
Feature 1 (60–70 cm)	indeterminate	intact/nearly complete	middle	60.4	40.1	16.9
Feature 1 (60–70 cm)	adze	intact/nearly complete	late	49.6	38.4	14.6
Feature 1 (70–80 cm)	indeterminate	barb	late	–	–	6.5
TEST UNIT 4						
Level 4 (30–40 cm)	graver	distal	finished	–	–	6.4
Level 5 (40–50 cm)	indeterminate	edge	early	–	–	18.0
Level 6 (50–60 cm)	adze	intact/nearly complete	early	59.1	39.2	21.7
Level 6 (50–60 cm)	indeterminate	edge	early	–	–	10.3
Level 12 (110–120 cm)	indeterminate	edge	early	–	–	15.5
TEST UNIT 5						
Level 12 (110–120 cm)	indeterminate	edge	early	–	–	16.0

Note: All measurements are in millimeters.

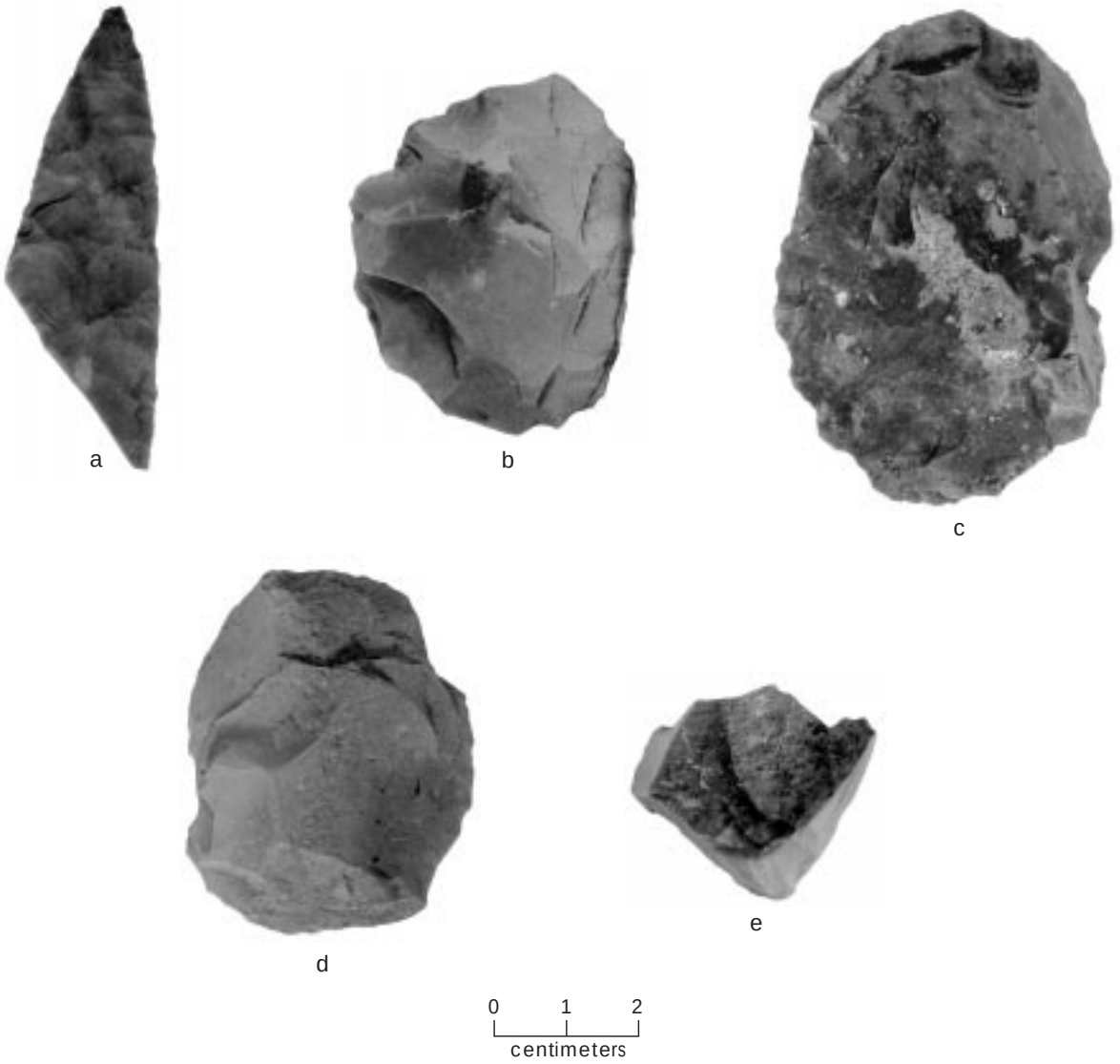

Figure 26. Bifaces and a uniface from 41ML162. (a) Knife; (b–c) adzes; (d) indeterminate biface; (e) end/side scraper.

is represented by 53 percent (n = 590) of the debitage. The second most-frequent size class is 2–3 cm, as represented by 28 percent (n = 303) of the assemblage. Seven percent (n = 77) of the debitage are less than 1 cm in size, and 12 percent (n = 136) are 3–6 cm in size. Raw material colors vary from light mottled gray or dark gray cherts, the more common color, to variations of brown. An almost black chert material was noted but is rare. Many flakes display a pinkish hue from thermal alteration.

INVERTEBRATE FAUNAL REMAINS

Four hundred sixty-four of the 820 mussel shells collected are complete enough for taxonomic identification (see Appendix B). The taxa consist of *Amblema plicata*, *Cyrtonaias tampicoensis*, *Leptodea fragilis*, *Potamilus purpuratus*, *Potamilus* sp., *Quadrula apiculata*, *Quadrula petrina*, *Quadrula* sp., and *Tritogonia verrucosa* (one fossil oyster [Cretaceous] also was identified). By far the most common taxon (n = 299) is *Amblema plicata* (threeridge mussel).

Table 7. Provenience and metric data for unifaces from 41ML162

Provenience	Tool Type	Completeness	Cortex	Length	Width	Thickness
TEST UNIT 1						
Level 11 (100–110 cm)	knife	medial	present	–	21.4	8.6
TEST UNIT 2						
Level 4 (30–40 cm)	spokeshave	distal	absent	–	26.6	5.3
Level 5 (40–50 cm)	end/side scraper	proximal	present	–	22.3	9.7
Level 8 (70–80 cm)	end scraper	distal	absent	–	24.2	4.1
TEST UNIT 3						
Level 4 (30–40 cm)	spokeshave	intact/nearly complete	present	29.7	34.2	13.1
TEST UNIT 4						
Level 7 (60–70 cm)	end scraper	intact/nearly complete	present	20.1	27.6	4.8
Level 11 (100–110 cm)	end/side scraper	intact/nearly complete	present	31.1	26.4	10.6

Note: All measurements are in millimeters.

VERTEBRATE FAUNAL REMAINS

Bone preservation at 41ML162 is good. Of the 261 specimens collected, 230 were analyzed (see Appendix C). The remaining unanalyzed fragments were either recovered from flotation (n = 25) (see Cultural Features) or inadvertently left out of the faunal analysis (n = 6). The 6 latter specimens vary in size from 1 to 3 cm, and 3 appear to be burned.

Seventeen (7 percent) of the analyzed specimens could be identified at the genus/species or family level (Table 9). Bison, deer, cottontail rabbits, turtles, and drum are the species or families identified. At the order level, Artiodactyla is represented by 21 (9 percent) goat/deer-sized specimens and 3 (1 percent) cow/bison-sized specimens. The class level consists

Table 8. Provenience and metric data for cores from 41ML162

Provenience	Number of Flake Scars	Direction of Flake Scars	Length	Width	Thickness
TEST UNIT 1					
Level 11 (100–110 cm)	8	multidirectional	63.3	50.2	28.2
TEST UNIT 2					
Level 4 (30–40 cm)	3	unidirectional	45.4	20.7	15.8
Level 9 (80–90 cm)	6	multidirectional	93.4	43.1	29.9
TEST UNIT 3					
Feature 1 (50–60 cm)	9	multidirectional	43.5	31.2	25.7
TEST UNIT 4					
Level 12 (110–120 cm)	3	unidirectional	62.5	41.7	27.1
Level 12 (110–120 cm)	4	multidirectional	87.9	47.5	21.6

Note: All measurements are in millimeters.

Table 9. Vertebrate faunal remains from 41ML162

Taxa	Quantity
Osteichthyes (medium-sized)	2
Sciaenidae (drum)	1
Testudinata (turtles)	11
Sylvilagus sp. (cottontail rabbits)	2
Odocoileus sp. (deer)	2
Bos/Bison (cow/bison)	1
Artiodactyla (goat/deer-sized)	21
Artiodactyla (cow/bison-sized)	3
Mammalia (rabbit/canid-sized)	1
Mammalia (canid/deer-sized)	114
Mammalia (large/very large)	26
Vertebrata (vertebrates)	46
TOTALS	230

of specimens of Osteichthyes (bony fishes) (n = 2) and Mammalia (n = 141). The Mammalia specimens consist of 1 rabbit/canid-sized, 114 canid/deer-sized, and 26 large/very large animals. This suggests that deer is probably the most common species represented in the assemblage. Twenty percent of the assemblage (n = 46) are only recognizable as Vertebrata.

OTHER MATERIALS

Other cultural materials recovered at the site include pottery; ground, pecked, and battered stone tools; burned clay lumps; and burned rocks. Because burned rocks from nonfeature contexts were not consistently quantified, detailed recovery summaries cannot be provided. However, nonfeature burned rock weights for entire test units consist of ca. 8 kg for Test Unit 1, ca. 41 kg for Test Unit 2, ca. 3 kg for Test Unit 3, ca. 34 kg for Test Unit 4, and ca. 1 kg for Test Unit 5.

Pottery

One small, undecorated pottery sherd was recovered from Feature 1 (Test Unit 3, Level 7 [60–70 cm]). Although the finished interior surface is not preserved, the exterior surface of the sherd is smoothed. It appears to be shell tempered. The sherd is less than 1 cm in size, and the vessel part cannot be determined. The maximum thickness of the sherd is 4.8 mm.

Ground, Pecked, and Battered Stone Tools

Four ground, pecked, and battered stone tools were recovered. All are of fine- to medium-grained quartzite. Provenience and metric data are presented in Table 10. The first specimen, from Test Unit 1, is oblate or disk-shaped. It exhibits pecked and battered surfaces on both ends, suggesting it functioned as a hammerstone. The second artifact, from Test Unit 2, is a larger oblate tool that is ground smooth on one face. It may have functioned as a mano. The third tool, from Test Unit 3, is spheroidal. It has both pecked surfaces and small grinding facets on its faces and ends. This tool may have been used as a grinding stone as well as a hammerstone. The last specimen also is from Test Unit 3. It is oblate or disk-shaped (Figure 27). While there is pecking on the faces and ends, one end is heavily battered. This tool served as a hammerstone, and it may have been used for other purposes such as processing nuts.

Burned Clay Lumps

A total of 1.0 kg of burned clay lumps were recovered, the vast majority (0.9 kg) from Level 5 (40–50 cm) of Test Unit 2. Most are 1–3 cm in size and lack impressions, but a small number clearly display grass, twig, and stick impressions. It is possible that these specimens, as well as many of those lacking impressions, could be daub from a wattle-and-daub structure. Supporting this notion is the presence of a mud dauber nest in and amongst the many burned clay lumps recovered from Level 5 of Test Unit 2. In natural settings, mud daubers, or the common black and yellow wasp (*Sceliphron* sp.), build their nests in protective settings, such as under cliff overhangs and in hollow trees (Evans and Eberhard 1970:102). Shelters and other human-built structures provide similar protective settings that are used by mud daubers for the placement and construction of nests. At the Peerless Bottoms site (41HP175) in Hopkins County, several mud dauber nests with grass and small stick impressions were recovered from and around a hearth feature (see Fields

Table 10. Provenience and metric data for ground, pecked, and battered stone tools from 41ML162

Provenience	Wear Location and Type	Working Surface Length	Working Surface Width	Length	Width	Thickness	Weight
TEST UNIT 1							
Level 11 (100–110 cm)	both ends, pecked and battered	36.5	15.5	68.1	55.8	23.7	139.2
TEST UNIT 2							
Level 5 (40–50 cm)	one face, ground smooth	80.8	78.7	109.0	81.9	52.1	668.0
TEST UNIT 3							
Level 4 (30–40 cm)	faces and ends, pecked and ground	60.5	40.6	61.7	46.9	43.8	158.0
Level 4 (30–40 cm)	faces and ends, pecked	52.5	22.1	65.3	59.0	31.7	180.9

Note: All measurements are in millimeters or grams.

et al. 1993:216–218). Based on the co-occurrence of burned clay lumps and other cultural materials and the behavioral aspects of mud daubers, Fields et al. (1993:218) make a convincing argument for the presence of some type of structure, possibly of wattle-and-daub, at the site. The same might be said for 41ML162, i.e., that the remains of some sort of wattle-and-daub structure are present in the vicinity of Test Unit 2; however, its dimensions, function, and age are not known at this time.

Chronology and Components

A combination of radiocarbon dates, temporally diagnostic artifacts (projectile points), and soil stratigraphy allows for the delineation of interpretable components and chronology at 41ML162. Ideally, deposition, when relatively concurrent with occupations, produces archeological sites in which the different occupations can be separated or isolated from one another for study (Ferring 1986). Thus, the eastern half of the site (Test Units 2 and 3) should yield discrete components with good contextual integrity, given its history of more or less continuous aggradation. However, the cultural materials and chronological data recovered from below the Ab horizon on the eastern half of the site are so limited that it is difficult to define any meaningful components. Even more difficult is delineating components for the cultural materials derived from the Ab horizon, even though the soil is cumulic in nature. Projectile point styles from this soil suggest that multiple components representing a time span encompassing the latter part of the Late Archaic through the Toyah phase are mixed and compressed within the soil. Conversely the western half of the site (Test Units 1, 4, and 5) with its multiple buried soils yielded enough cultural materials (including diagnostics) and chronological data in fairly discrete packages that meaningful and interpretable components can be defined. Therefore, the defined components do not represent all the cultural materials and features recovered at 41ML162.

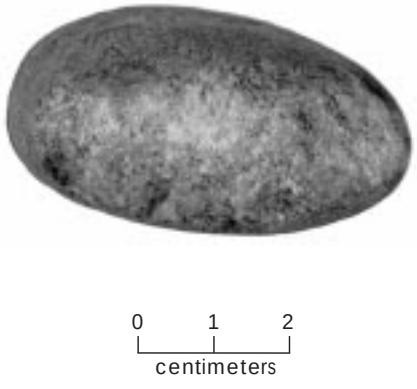

Figure 27. Ground stone tool from 41ML162.

Five components are defined. The first, and most recent, consists of those artifacts and other materials recovered from the upper part of the Ab horizon (Levels 6–8 of Test Units 1 and 5, and Level 4 of Test Unit 4). No diagnostic artifacts are included in this component, but a radiocarbon age on oak wood charcoal from Test Unit 5, Level 8 (72 cm), produced a radiocarbon age of 810 ± 40 B.P. (Beta-154291), suggesting that the associated cultural materials are affiliated with the latter portion of the Austin phase or early Toyah phase. Artifacts and other materials associated with this Late Prehistoric component consist of 1 bifacial graver, 3 pieces of edge-modified debitage, 27 pieces of unmodified debitage, 29 mussel shells, and 26 pieces of bone. The small debitage assemblage suggests that cortical materials (chert cobbles) were reduced on site, probably for the production of bifacial tools. Flakes were utilized to complete expedient tasks, but these flakes probably were the byproducts of reduction rather than the final product. Other possible activities might include wood and bone engraving, based on the recovery of a graver. Though none of the vertebrate faunal remains are identified at the genus or species level, the specimens probably represent deer and bison, given the presence of medium-sized Artiodactyla, medium-sized to large mammals, and large to very large mammalian elements. The majority of the mussel shells are unidentifiable, and *Amblema plicata* (threeridge mussel) is the most common. Considering no Scallorn arrow points were recovered, the balance of the evidence suggests that this component might represent an early Toyah phase occupation. A Perdiz arrow point was recovered from the mixed deposits on the eastern half of the site, and though not clearly identified, probable bison remains are part of the faunal assemblage. A subsistence strategy focused on bison hunting is often attributed to Toyah peoples, which is a radical departure from the subsistence practices attributed to the preceding Austin phase peoples (Collins 1995; Prewitt 1981).

The second component consists of artifacts and other materials also recovered from the Ab horizon (Levels 9–10 of Test Unit 1, Levels 9–10 of Test Unit 5, and Levels 5–6 of Test Unit 4). An Ensor dart point is the only diagnostic artifact associated with this component. A radiocarbon age on bulk soil (50–60 cm) yielded a radiocarbon age (1720 ± 60 B.P., Beta-154293) that is consistent with Prewitt's (1981) Twin Sisters phase, of which the Ensor point is considered an index marker. It is probable that Feature 1 (the burned rock midden [or at least a portion of it]) and the Ellis points from the eastern half of the site are associated with this component based on the radiocarbon age from Feature 1 (1980 ± 60 B.P., Beta-154279) and general age estimates for Ellis points (Prikryl 1990:56–57). The age estimate for this component based on the chronological data is ca. 2000–1400 B.P. Artifacts and other materials associated with this later Late Archaic component consist of 1 dart point (Ensor); 3 bifaces, including an adze; 8 edge-modified flakes; 192 pieces of unmodified debitage; 117 mussel shells; and 22 pieces of bone. The debitage assemblage indicates that the cortex of most materials probably was removed elsewhere, and raw materials may have been brought to the site as large blanks and preforms. The on-site reduction of raw materials probably was geared toward bifacial tool production. Flake byproducts appear to have been used occasionally for expedient tasks but were never the focus of tool production themselves. The bifacial tools along with the expedient tools indicate a variety of activities, such as hunting, game processing, and woodworking. The vertebrate faunal assemblage, consisting largely of medium-sized to large mammalian and medium-sized Artiodactyla elements, suggests that deer were a large part of a diet that included turtles and mussels. If associated with this component, the burned rock midden indicates intensive processing of plant foods. Prewitt (1981:81) notes that a wide array of food sources was utilized during this time period.

The third component consists of artifacts, features, and other materials recovered from the base of the Ab horizon (Levels 11–12 of Test Units 1 and 5, and Levels 7–8 of Test Unit 4). Three radiocarbon ages are associated with this component. Two are from Feature 2 (see Cultural Features). The third is from charcoal collected from Level 12 (112 cm) of Test Unit 1, which produced a radiocarbon age of 2210 ± 40 B.P. (Beta-154283). Though no diagnostic artifacts are part of this component, it is probable that the Marcos dart point from Test Unit 2, Level 4, is associated with this component based on the age estimates for this point style (Collins 1995; Johnson and Goode 1994; Prewitt

1981, 1985). These chronological data date the component to ca. 3000 and 2000 B.P. Component artifacts and other materials consist of 2 bifaces, including a knife fragment; 2 unifaces consisting of a knife fragment and end scraper; 1 core; 4 pieces of edge-modified debitage; 124 pieces of unmodified debitage; 1 ground, pecked, and battered stone tool; 79 mussel shells; and 13 pieces of bone. The debitage assemblage indicates that some cortical materials were reduced initially at the site and that reduction strategies probably were geared toward the production of bifaces. Although the production of bifacial tools resulted in numerous flakes, few were utilized. Expedient flake tools and, more commonly, formal tools were used to complete a variety of tasks. Along with plant food processing suggested by the small burned rock feature (Feature 2), game and hide processing are two probable site activities. The small vertebrate faunal assemblage includes medium-sized to large mammalian elements and one deer element. Some of the elements are burned and charred. Aside from deer, mussels also appear to have been a small part of the diet.

The fourth component consists of artifacts and other materials recovered from the 2Ab horizon (Levels 11–13 of Test Unit 4). Three radiocarbon ages are associated with this component. Two charcoal samples collected from Levels 12 (110–120 cm) and 13 (127 cm) produced radiocarbon ages of 3600 ± 40 B.P. (Beta-154282) and 3490 ± 40 B.P. (Beta-154292), respectively. The third radiocarbon age of 3400 ± 70 B.P. (Beta-154294) is on bulk soil collected from the 2Ab horizon. No diagnostic artifacts are associated with this component, but the radiometric data appear to securely date the component to ca. 4000–3600 B.P., or the early Late Archaic. The component artifacts and other materials consist of 1 indeterminate early stage biface, 1 unifacial end/side scraper, 2 cores, 1 piece of edge-modified debitage, 45 pieces of unmodified debitage, 72 mussel shells, and 1 piece of bone. Though small, the chipped stone artifact assemblage suggests that cortex-covered chert cobbles were reduced initially at the site and that the reduction strategies probably focused on the production of bifaces. Flake byproducts appear not to have been used extensively for expedient tasks. The small formal tool assemblage does not offer many insights into what other tasks took place at the site, other than possibly hide and/or woodworking activities. Faunal remains indicate that mussels and a large to very large mammal(s) were consumed. The mussel shell assemblages in the three later components are dominated by the species *Amblema plicata* (threeridge mussel), but in the early Late Archaic component *Quadrula* sp. and *A. plicata* are equally dominant. Whether this dominance by a single species (*A. plicata*) later in time is an artifact of human preference or change in environment or habitat is not known, although the preferred habitats of both species are similar.

The fifth and earliest component consists of artifacts and other materials recovered from the 3ABb horizon (Levels 16–18, Test Unit 4). Dating of this component is tenuous, as no radiocarbon assays are available. However, a single projectile point (termed Provisional Type 1) suggests that the component dates to ca. 5000–4000 B.P., based on a similar point style from dated contexts at Fort Hood (see Kleinbach et al. 1999:335–344). This time frame places the component in the latter part of the Middle Archaic. Component artifacts and other materials consist of 1 dart point (Provisional Type 1), 3 pieces of edge-modified debitage, 29 pieces of unmodified debitage, 60 mussel shells, and 11 bone fragments. Though small, the debitage assemblage suggests that chert cobbles were reduced initially at the site. Tool production was probably geared toward the manufacturing of bifacial tools, and the flake byproducts occasionally were used to complete expedient tasks. What activities these bifacial tools might have been used for are difficult to say given the near-absence of formal tools. Much of the vertebrate faunal assemblage is represented by medium-sized to large mammalian elements (some burned), suggesting that deer was probably a large part of the diet. Turtles and mussels also were consumed at the site during this time period.

Summary and Assessment

The contextual integrity, stratigraphic separation, and preservation of many of the artifacts, features, and other materials recovered from 41ML162 are exceptional and, in conjunction with the chronological data, provide the necessary elements for the delineation of interpretable components or units of study. The

components date from the latter part of the Middle Archaic period (ca. 5000 B.P.) to the Toyah phase. Inhabitants of the site during this time frame utilized the locality as a base camp, given the variety of activities and tasks indicated by the artifacts and features. How these activities and tasks changed or stayed the same over this ca. 4,500-year period is not fully understood at this time, though it is believed that the site has the capacity to yield data relevant to these questions. A more-specific issue that can be addressed is subsistence and diet throughout this time period, based on the preservation of faunal remains and other organic materials, which also may serve as proxy indicators of environmental change. The recovery of discrete tool assemblages from well-dated contexts would provide substantial data on the changes (or stability) in tool kits over time and the potential ability to identify diagnostic assemblage characteristics. The same can be said for features at the site, in terms of their function, morphology, and composition, as well as how or why these attributes changed or stayed the same over time. For these reasons, it is recommended that 41ML162 be considered eligible for listing in the National Register of Historic Places.

Site 41ML179

Description

Site 41ML179 consists of the structural remains of a farmstead established by Nicholas and Jennett Sneed in 1866. It is situated at an elevation of 460 to 462 ft on a higher alluvial surface, probably representing a Pleistocene terrace, on the north side of Hog Creek near where the creek enters Waco Lake (see Figure 4). The site is ca. 75 m northeast of the creek. On the limestone creek bank opposite the site are two springs/seeps. Vegetation in the area consists of pecan, oak, elm, bois d'arc, and juniper trees with a thick understory of greenbriers and shrubs.

Previous Investigations

Site 41ML179 was recorded, shovel tested, and subjected to archival investigation in 1984 (Prikryl and Jackson 1985:229–231). Scattered limestone and sandstone rocks were noted along with sparse historic artifacts over a 115x35-m area. A clearing with a mound of limestone rubble in the west-central part of this area was interpreted as representing the former housesite.

Two shovel tests were excavated. The first was at the western end of the site and was excavated to a depth of 30 cm. The soil was clayey, and artifacts (one ironstone sherd and one bottle glass fragment) were recovered only from the first 15 cm. The second test was just east of the limestone rubble mound and was excavated to a depth of 23 cm. Recovered artifacts included ironstone sherds, bottle and window glass fragments, a cut nail, and miscellaneous metal fragments.

Archival research revealed that the site occupies land that was once part of a 743-acre tract owned by William Badger, who sold portions of his estate to the Corps of Engineers in 1962. Badger acquired the land from Josephine McLennan, who inherited the property from her father, Neil McLennan. Neil McLennan bought the land in 1877 from Nicholas Sneed after their home (which the site's structural remains apparently represent) burned in 1877. The home was not rebuilt after the fire.

Site 41ML179 was revisited in 1999 (Kvernes et al. 2000:57–58) as part of a site re-location and reassessment effort. It was found to be in much the same condition as originally reported. No sign of additional disturbance or impacts was noted. The rubble mound was identified, and some of the stones were lying flat, suggesting that they represent an intact foundation feature. Very few surface artifacts were observed. Two shovel tests were excavated near the rubble mound to assess site integrity and date the deposits. As with the original shovel tests, brown clay loam soils were noted to a depth of 30 cm. Shovel Test 99-1 yielded green transfer-printed whiteware (n = 5), undecorated ironstone (n = 1), aqua container glass (n = 2), window glass (n = 1), aqua glass slag (n = 5), porcelain buttons (n = 2), cut nails (n = 17), tin can fragments (n = 2), and a wire fragment (n = 1). Shovel Test 99-2 yielded undecorated ironstone (n = 2), brown container glass (n = 2), and clear container glass (n = 6).

All artifacts recovered were consistent with the suggested period of occupation, 1866–1877. No intrusive or later artifacts were discovered. Several ceramic sherds had scorch marks, melted glass was present, and

one of the porcelain buttons had been partially warped due to exposure to fire, supporting the house fire indicated in the archival record. The five sherds of transfer-printed whiteware were uncovered lying adjacent to one another. All sherds crossmended, suggesting that they were lying where they fell when fire destroyed the house. Thus, the shovel testing suggested that an intact, buried component is present at 41ML179.

Work Accomplished

During the 2000–2001 investigations, a long rebar stake was used as the primary datum and was given an arbitrary elevation of 100.00 m. The datum was placed ca. 6 m northwest of the center of Feature 1 (the rubble mound). A second datum (rebar) was placed near a large burr oak tree in the western part of the site, ca. 28 m southwest of the center of Feature 1.

The surface inspection yielded few artifacts since abundant leaf litter covers the area. Two ceramic sherds were found on the eastern edge of the site, while a clear bottle fragment was observed not far from Feature 1. Except for the obvious rubble pile making up Feature 1, no other features were identified. Feature 1 was swept to remove the leaf debris, photographed, and drawn in plan view.

Four test units were hand excavated (Figure 28). All began at modern ground surface and were terminated at 30–60 cm. Test Units 1 and 2 were placed on the eastern part of the Feature 1 rubble pile. Both units ended with Level 6. Test Unit 3 was placed just off the mound area to the east among a surface scatter of stone structural debris. This test unit was ended at Level 3. Test Unit 4 was south of Test Unit 3 and southeast of the Feature 1 mound, adjacent to Shovel Test 99-1 excavated in 1999. Excavations ceased in Level 4 of this unit. No new features were encountered in either Test Unit 3 or 4. In total, 1.9 m^3 were hand excavated.

Site Extent and Depth

While the property owned by the Sneed family encompassed a larger area, the site where the house once stood and its periphery cover ca. 700 m^2. The cultural zone at the site averages ca. 30–40 cm in thickness. Sediments consist of a 30–40-cm-thick dark brown clay loam over a sterile darker brown clay loam with abundant gravels. Forty-five percent of the 814 artifacts recovered from the test pits were from the upper 20 cm. Almost all of the remainder (53 percent, n = 429) were from 20–40 cm, with most materials coming from the subsurface component of Feature 1 in Test Units 1 and 2. That zone appears to represent a buried concentration of destruction debris. Test unit yields across the site are Test Unit 1 (n = 246), Test Unit 2 (n = 232), Test Unit 3 (n = 71), and Test Unit 4 (n = 265).

Cultural Feature

One feature, Feature 1, was identified and tested. It is represented by a low (ca. 35 cm) rubble mound covering about 5 m north-south by 4.5 m east-west (Figure 29). Other than the various limestone and sandstone fragments, no artifacts are present on the surface. Test Units 1 and 2 made up a 1x2-m unit on the eastern side of the mound. Test Unit 1, to the south, examined the higher part of the mound, while Test Unit 2, to the north, examined the lower area on the mound periphery.

Excavation of Feature 1 revealed cut sandstone blocks, including large in situ foundation stones, and numerous artifacts. Many of the dressed blocks have mortar between them. Both limestone and sandstone were observed in the feature fill. Much of the material is burned. Recovery from the upper 10 cm of both units excavated in the feature consisted primarily of jumbled burned stone and mortar fragments in a loose, loamy fill deposit. At 10–20 cm, the density of jumbled stones increased in Test Unit 1, as did artifact recovery. The rocks exhibited fire fractures, and large amounts of sediment were present between the stones. About half of Test Unit 2 was covered by intact chimney fall at this depth, with the linear alignment of the stones suggesting that the collapse fell in a northward direction.

By 20–30 cm, many more of the stones uncovered appeared to be in situ, representing the upper portion of the intact base of the chimney feature. In Test Unit 1, stacked, mortared stones were observed across the entire unit but were concentrated in the southwestern quadrant. Few intrusive artifacts were recovered from amongst them. In Test Unit 2 to the north, a burned deposit with ash, many

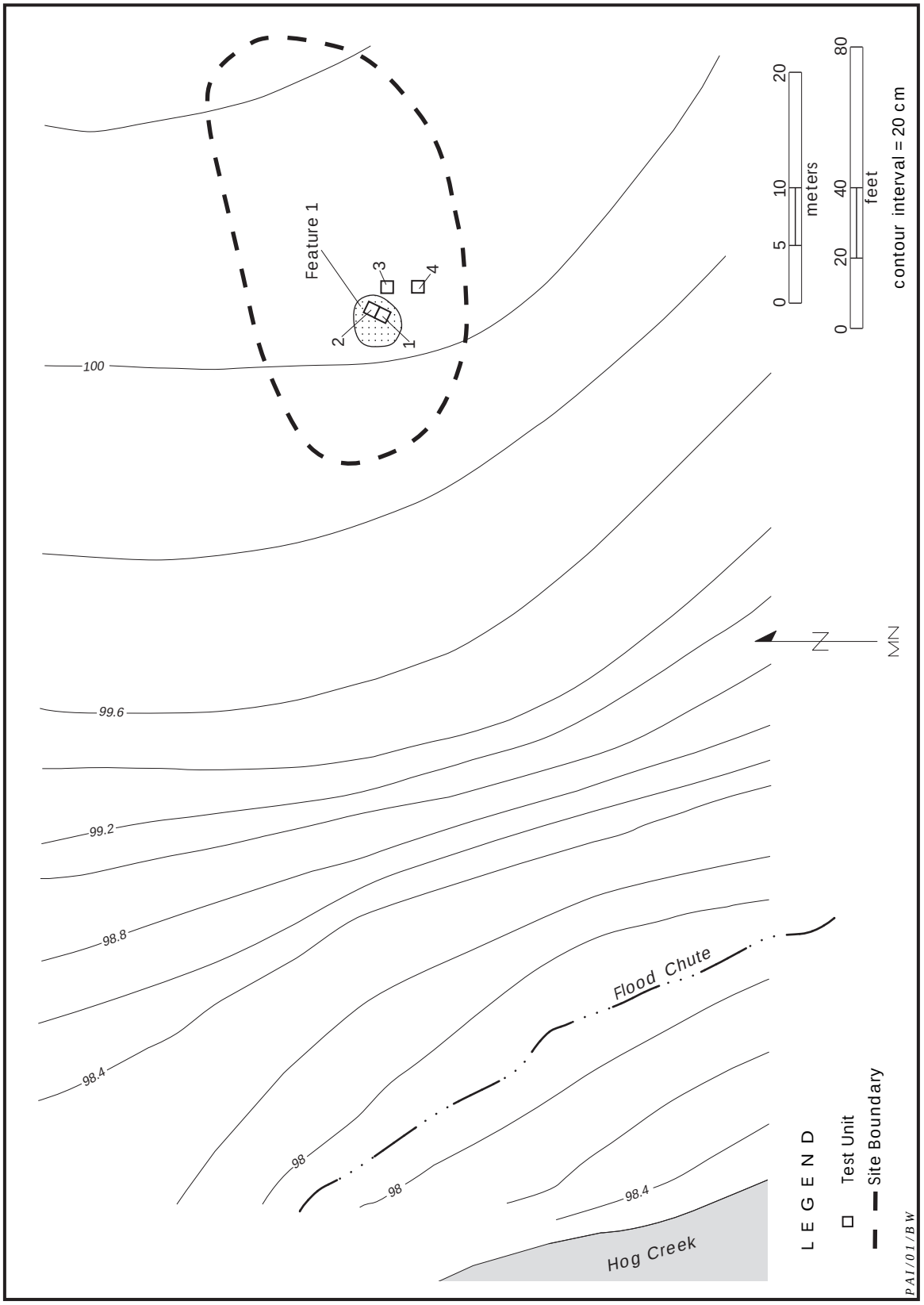

Figure 28. Map of 41ML179.

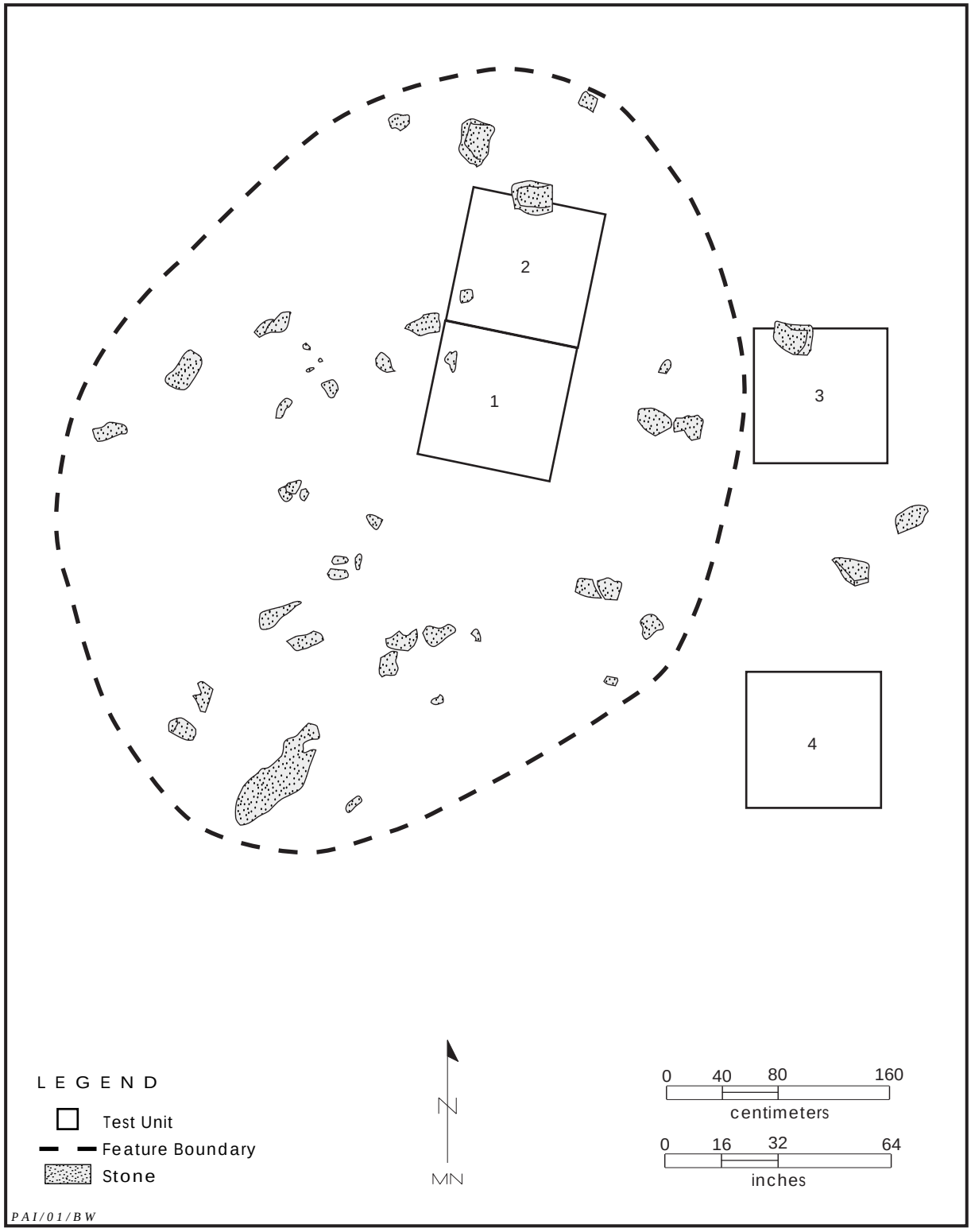

Figure 29. Plan view of Feature 1 at the Sneed Farmstead, 41ML179.

artifacts, and little stone or mortar covered the eastern half of the unit. At 30–40 cm, the rocks in the western half of Test Unit 1 were larger (30x30 cm and larger) and mortared together in courses (Figure 30), representing the intact base of the foundation. Little intrusive sediment/debris or thermal fracturing was noted. Test Unit 2 had few stones or mortar across its entire extent at this level but yielded many more artifacts in a burned and ashy matrix. Little rubble and few artifacts were found below the large stones in either unit, and most appeared to be resting immediately below the bottom layer of stones. The chimney foundation probably was set into a builder's trench, although no evidence of this could be seen in the dark sediments.

The maximum thickness of Feature 1 is approximately 45 cm, with most of that being the ca. 35-cm-high rubble mound. Within this, a burned layer containing large amounts of charcoal, melted glass, and burned domestic artifacts extends in an 8-cm-thick lens across Test Units 1 and 2 at a depth of 32–40 cm. This destruction debris deposit presumably overlies an unobserved builder's trench and clearly relates to destruction of the house by fire. Deposits below the feature are culturally sterile. No artifacts were recovered in Test Unit 1 at 50–60 cm and Test Unit 2 at 45–60 cm. Of the 603 artifacts collected from Feature 1, including glass, nails, miscellaneous metal, ceramics, and door hardware, few are diagnostic of a short time span; nonetheless, they surely relate to the 1866–1877 Sneed occupation.

Materials Recovered

Artifacts recovered from 41ML179 consist of ceramics (n = 24), glass (n = 376), metal (n = 405), faunal remains (n = 6), and other materials (n = 3) (Table 11).

CERAMICS

Of the 24 ceramic sherds, 17 are whiteware, 3 are stoneware, 1 is porcelain, 2 are porcelain buttons, and 1 is a ceramic door knob.

Whiteware

The 17 whiteware sherds exhibit the following decorative types: undecorated (n = 5), burned (n = 7), transfer printed (n = 4), and gilded (n = 1). The most diagnostic and significant of these are the transfer-printed whiteware sherds (Figure 31). None are associated with Feature 1.

Transfer-printed ceramics typically are highly diagnostic because they can be dated accurately to short spans of time based on their patterns. Although these sherds are the same pattern as those recovered during the previous phase of work (Kvernes et al. 2000:58), this floral pattern is not identifiable. However, dating information is available based on the color and style of the print. The design is a floral motif around the vessel rim printed in a light green—traits commonly found in the late nineteenth century (Majewski and O'Brien 1987:145). This is consistent with the Sneed occupation from 1866 to 1877.

Stoneware

The three sherds of stoneware represent three different types, and at least that many vessels. Stoneware glaze types are Bristol and Albany (n = 1), Albany (n = 1), and alkaline (n = 1). Stoneware sherds were recovered from both Test Unit 2 (on Feature 1) and Test Unit 4 (off Feature 1). The presence of alkaline-glazed stoneware is particularly notable because it was produced primarily by Southern folk potters in the nineteenth century (Lebo 1987:131).

Porcelain

The one sherd of porcelain is bone china, a kind of soft-paste porcelain commonly manufactured in the nineteenth century and later (Majewski and O'Brien 1987:126–127). It was recovered from Level 4 of Feature 1, the destruction debris layer.

Other Ceramics

The remainder of the ceramics assemblage consists of two porcelain buttons (n = 2), one black and one white. Both are four-hole sew-through types. A mottled-ware ceramic door knob (n = 1) also was recovered.

GLASS

Glass artifacts fall into six general catego-

Figure 30. Photograph of Feature 1 as exposed in Test Units 1 and 2 (Level 4) at the Sneed Farmstead, 41ML179. View is to the south.

ries: table glass (n = 13), kerosene lamp chimney glass (n = 2), container glass (n = 82), window glass (n = 86), unidentified/melted glass (n = 192), and other glass (n = 1).

Table Glass

Table glass is defined as "glassware used on the table and associated with food and drink, as well as some items of decorative glassware, such as vases" (Jones and Sullivan 1989:127). The 13 sherds recovered are opaque white/milk glass (n = 2), clear/colorless glass (n = 9), and clear/colorless pressed glass (n = 2). Of particular note is the pressed soda-lime glass tableware, most commonly found on sites postdating 1860 (Jones and Sullivan 1989:12). All of the pressed glass tableware sherds were recovered from the upper 20 cm of Test Unit 4, located off Feature 1.

Kerosene Lamp Chimney Glass

Two sherds of glass from the chimney portion of kerosene lamps were recovered. Only lead glass specimens are represented. Although lead glass was replaced by soda-lime glass in the 1860s for the manufacture of tableware, lead glass continued to be used for making lamp chimneys through the latter portion of the nineteenth century (Woodhead et al. 1984:61).

Container Glass

Eighty-two sherds of container glass (primarily from bottles and jars) were recovered. Colors represented are aqua (n = 30), clear/colorless (n = 42), brown (n = 5), solarized (n = 4), and green (n = 1). Most of the colors of glass recovered are not tightly diagnostic because of the long span of their use in container production. The exception is solarized glass, which was made primarily from ca. 1875 to 1914 (Jones and Sullivan 1989:13).

Window Glass

Eighty-six window glass sherds were recovered. The greatest concentration occurred in the test units off Feature 1.

Table 11. Summary of cultural materials from 41ML179

Provenience	Ceramics	Glass	Metal	Faunal	Other	Totals
TEST UNIT 1						
Level 1 (0–10 cm)	–	7	1	–	–	8
Level 2 (10–20 cm)	–	18	3	–	2	23
Level 3 (20–30 cm)	–	1	2	–	–	3
Level 4 (30–40 cm)	6	104	85	2	–	197
Level 5 (40–50 cm)	–	7	2	3	–	12
Level 6 (50–60 cm)	1	1	–	1	–	3
Subtotals	7	138	93	6	2	246
TEST UNIT 2						
Level 1 (0–10 cm)	–	1	–	–	–	1
Level 2 (10–20 cm)	–	4	–	–	–	4
Level 3 (20–30 cm)	2	26	50	–	–	78
Level 4 (30–40 cm)	2	24	119	–	1	146
Level 5 (40–50 cm)	–	3	–	–	–	3
Subtotals	4	58	169	0	1	232
TEST UNIT 3						
Level 2 (10–20 cm)	3	46	22	–	–	71
TEST UNIT 4						
Level 1 (0–10 cm)	8	113	108	–	–	229
Level 2 (10–20 cm)	2	18	11	–	–	31
Level 3 (20–30 cm)	–	3	2	–	–	5
Subtotals	10	134	121	0	0	265
TOTALS	24	376	405	6	3	814

Unidentified/Melted Glass

The artifacts in this category (n = 192) are glass fragments that have been melted or otherwise distorted by fire so that identification beyond material type is impossible. Melted glass is heavily concentrated in Level 4 of Feature 1, which correlates well with other evidence of the Sneed house being destroyed by fire.

Other Glass

One glass artifact that does not fit into any of the other categories is a circular piece (2 inches in diameter) of clear glass recovered from Level 4 of Feature 1. It appears to be either a small mirror from which the silvering has worn away, or possibly glass from a small photograph frame.

METAL

Metal artifacts constitute the largest material type recovered. Artifact types consist of cut nails (n = 301), wire nails (n = 33), screws/bolts (n = 7), wire (n = 3), fencing staples (n = 2), tin can fragments (n = 15), clothing fasteners (n = 2), buttons (n = 4), and miscellaneous metal (n = 38).

Cut Nails

Cut nails (n = 301) represent the dominant type of structural fastener utilized at 41ML179. Occupation of the property reportedly took place between 1866 and 1877. That implies that the initial construction at this location took place in the immediate postbellum period. The presence of cut nails in large numbers is consistent with a mid-nineteenth-century construction episode with no reoccupation after the house burned.

Wire Nails

Only 33 wire nails were recovered from the site. They probably represent small repairs to the existing structure under the ownership of the Sneed family. Wire nails, although invented in 1850, were not widely available until the late nineteenth century (Noël

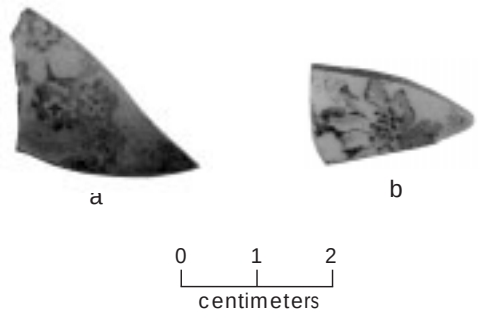

Figure 31. Transfer-printed ceramics from 41ML179.

Hume 1991:254). Their presence in small numbers at 41ML179 indicates initial consumer access to wire nails.

Screws/Bolts

Seven screws and bolts were recovered. All appear to be related to machinery or farm implements rather than architectural fasteners. Specimens were recovered from all of the test units, and no spatial patterning is apparent.

Wire

Wire fragments (n = 3) of different gauges (plain only) were recovered. They would have been used for a multitude of tasks on a farm.

Fencing Staples

Directly related to the use of wire for fencing is the use of staples to secure the wire to support posts. Two fencing staples were recovered, but they probably are not related to the Sneed occupation. Barbed wire fencing was not common until the 1880s, which suggests that fencing on the property probably was not undertaken in any systematic fashion until after the Sneeds sold the property.

Tin Can Fragments

A small number (n = 15) of identifiable tin can fragments was recovered. All came from contexts associated with Feature 1. The small number suggests that commercial foods were used only minimally and that home preservation and storage of foodstuffs was more commonly practiced.

Clothing Fasteners

Two metal clothing fasteners were recovered from Test Unit 1. One is an overalls rivet, and the other is a safety pin. Neither item is particularly diagnostic, but production of work clothing such as overalls began in the 1870s (Psota 1999).

Miscellaneous Metal

Metal artifacts that do not fit easily into any of the other established categories are classed as miscellaneous metal (n = 37). These are a lead fragment (possibly a window sash weight), a cartridge casing, a shotgun shell head, 18 fragments of unidentified metal, 7 pieces of the cast iron base and legs of a sewing machine, a furniture caster, a drawer pull, and 7 fragments of a purse frame.

MISCELLANEOUS ARTIFACTS

Artifacts that are identifiable in material and/or function but that do not fit easily into any of the other established categories were classed as miscellaneous. These consist of vertebrate faunal remains (n = 6) and a slate pencil (n = 1).

Vertebrate Faunal Remains

Vertebrate faunal remains (n = 6) were recovered exclusively from Test Unit 1. Identified taxa are Mammalia (canid/deer-sized, n = 5) and Artiodactyla (goat/deer-sized, n = 1) (see Appendix C). The bones probably represent random occurrences of food remains in the house at the time of the fire.

Slate Pencil

A single sharpened slate pencil was recovered from Level 4 of Test Unit 2. It probably represents a personal possession lost when the house burned.

Mortar

Two pieces of mortar were collected from Test Unit 1 as samples.

Chronology and Components

The chronology for 41ML179 is based on the artifacts recovered and the archival evidence of activity on the property. A single component is present. The component is defined by Feature 1, the collapsed stone chimney. Based on the strong correlation between the archival evidence and the material culture recovered, the site clearly is associated with Sneed family activities from 1866 until 1877, after which the locale was never reoccupied.

With reference to Feature 1, the only feature at the site, archival research suggests that

the original structure erected by the Sneed family was at this location, and that it was most likely a log cabin with a stone fireplace. Although excavation undertaken to explore the site yielded little beyond the immediate feature area, the intact foundation remains uncovered confirm its identification. The presence of large amounts of burned materials (especially glass) also corroborates the identification with Sneed's burned house.

Feature 1 represents only a small portion of the farmstead. It is probable that the family relied on the nearby springs at Hog Creek for water and did not have either a well or a cistern, and it is possible that the isolated farm family did not bother with the formality of digging a privy. In addition, the various components related to agricultural production, particularly a barn or other outbuildings, are not represented at this site. Only the simplest of activities of basic habitation can be interpreted based on the single feature and the small artifact assemblage. The artifacts indicate the use and discard of a common assortment of domestic goods, including table ceramics and container glass. The small number of tin can fragments suggests consumerism on a small scale, with food preparation, preservation, and storage probably taking place within the household. The home was equipped apparently with a sewing machine for the production of family garment and household linen needs. The Sneed family did have some luxury goods, as evidenced by fragments from a purse frame and a partial mirror or frame glass. Beyond these simple interpretations, little can be said. The habitation and its probable water source are in evidence, but other outbuildings or refuse disposal deposits are noticeably absent.

Summary and Assessment

Site 41ML179 is the 1866–1877 Nicholas and Jennett Sneed housesite. It consists of a single identified feature representing a collapsed chimney and an associated artifact scatter. While the artifact assemblage represents a limited span of time consistent with the archivally determined dates for the Sneed occupation, it has little capacity to contribute important information because it exhibits few attributes that would aid in site interpretation. For example, most of the table ceramic sherds are either undecorated or burned, much of the glass is melted beyond identification, and the largest single artifact class—cut nails—has little interpretive value beyond the obvious. Further, the single known feature was sufficiently excavated during testing, leaving little potential for it to yield additional information, and the lack of information on other features at the site limits inquiry into questions about farmstead layout, the use of space, and activity areas. These characteristics indicate that 41ML179 is ineligible for National Register listing under Criterion D.

Site 41ML185

Description

Site 41ML185 is a prehistoric site buried in Holocene alluvium along the south bank of the North Bosque River arm of the lake just downstream from where Davis Branch enters the lake; it is beneath and adjacent to the FM 185 bridge over the upper end of Waco Lake (see Figure 4). The terrace containing the site lies at an elevation of ca. 458–460 ft, while the floodplain just to north was at ca. 440 ft prior to inundation by the lake. Vegetation near the banks includes pecan, oak, and hackberry trees; however, much of the site beneath the bridge is open and supports grasses.

Previous Investigations

Site 41ML185 was recorded and subjected to minimal testing in 1984 (Prikryl and Jackson 1985:236–237). Prehistoric materials were noted over a distance of ca. 220 m in cutbanks 2–3 m high when the lake level was below its normal level due to drought. Debitage, burned rocks, bones, and mussel shells were observed, particularly at the confluence of the North Bosque River and Davis Branch. Three burned rock features were noted near the downstream end, one of which had been modified recently by fishermen to accommodate fire.

Cutbank exposures indicated that two buried zones of cultural materials might be present in the central part of the site. Two profile cuts were cleaned along the cutbank, one near the center of the site under the highway bridge (Profile Cut 1) and the other just to the west immediately downstream from where Davis Branch

enters the lake (Profile Cut 2). Four stratigraphic zones were identified. Zone 1, about 60 cm thick in Profile Cut 1 and 20 cm thick in Profile Cut 2, consisted of dark brown clay loam mixed with concrete and modern debris. A mottled reddish brown clay in Profile Cut 1 extended from 60 cm to the water table at 250 cm below the surface and was labeled Zone 2. Lenses of cultural materials were recorded within Zone 2 at 70–80 cm and 175–195 cm. Zone 2 was absent in Profile Cut 2, which instead had a dark grayish brown silty clay labeled Zone 3 extending from 20 to 80 cm; Zone 3 contained sparse prehistoric artifacts. Immediately downstream from the profile, Zone 3 contained two lenses of cultural materials between 40 and 78 cm. Zone 4, a tannish brown silty clay, extended from 80 to 115 cm below the surface only in Profile Cut 2; it yielded one mussel shell.

Site 41ML185 was revisited in 1999 as part of a site re-location and reassessment effort (Kvernes et al. 2000:55–56). A surface survey of the site area yielded two artifacts: one chert flake was found about 5 m south of a mussel shell cluster in the cutbank ca. 10 m west of the bridge, and another chert flake was found near the water line at the North Bosque River/Davis Branch confluence. Because the lake was at its normal conservation pool level of 455 ft, the extensive cutbanks visible in 1984 were inundated. The investigators noted limited impacts to the site since 1984. For example, the presence of willow trees in the same position in 1984 and 1999 near the eastern edge of the site indicates that shoreline erosion has not been extensive. However, the site area had suffered from the construction of the FM 185 bridge, as well as use of the area as a boat launching facility and fishing area. Gravel was dumped on the shore directly beneath the bridge. The shore immediately downstream from the bridge was disturbed badly by construction and use of a boat ramp, and the upper part of the terrace in the vicinity was disturbed by earthmoving and vehicular traffic.

Two shovel tests were excavated. Shovel Test 99-1 was placed approximately 60 m south of the North Bosque/Davis Branch confluence—10 m from the shoreline. This area was recorded in 1984 as yielding significant amounts of burned rocks and mussel shell fragments along the cutbanks. The shovel test was excavated to a depth of 40 cm, consisting entirely of gray loam. It produced no cultural materials. Shovel Test 99-2 was placed 10 m southwest of Shovel Test 99-1 parallel to the shoreline. The test similarly produced no artifacts, and a soil matrix of gray loam. The investigators concluded that the cultural deposits in this area were too deeply buried to be exposed through shovel testing.

Work Accomplished

During the 2000–2001 investigations, a wooden stake was used as the primary datum and was given an arbitrary elevation of 100.00 m. The datum was placed ca. 11 m south of Trench 1. A second datum (wooden stake) was placed near a large tree ca. 7 m southeast of Trench 1 and 9.5 m northeast of the primary datum.

Two backhoe trenches were excavated (Figure 32). It became evident during trenching operations that a thick, recent sandy mantle covered the old stable Holocene surface. This made trenching difficult and precluded trenching on the western end of the site. One trench was dug in the wooded portion of the site and one in the open terrace. Trench 1 was placed midway along the Davis Branch inlet at an orientation of 320°. It measured 2.6x1.6x2.5 m and yielded a few pieces of charcoal from 94 to 154 cm. Trench 2 was located out on the open point where Davis Branch enters Waco Lake. It was aligned at 16° and measured 2.7x1.5x3.0 m. At approximately 80–125 cm, mussel shell fragments, burned rocks, a few charcoal pieces, and a few pieces of debitage were observed in the buried A horizon. The Bw horizon yielded burned rocks at 148 cm (Feature 1) and 239 cm. A few mussel shells also were noted in these areas. A bulk sediment sample for radiocarbon dating was collected from the profile at 101–109 cm.

Five test units were excavated. All were terminated when the targeted cultural zone was investigated or the water table was reached. Test Units 1 and 2, which formed a 1x2-m unit, were on the western end of the site near the confluence of an unnamed drainage with Davis Branch. Excavation began at the modern ground surface and stopped at 200 cm (Level 20) in both units. The first eight levels in Test Unit 1 were removed as overburden and not screened. Test Units 3 and 4 were excavated on the southwest safety bench of Trench 1. The first levels began 90 cm below the modern ground

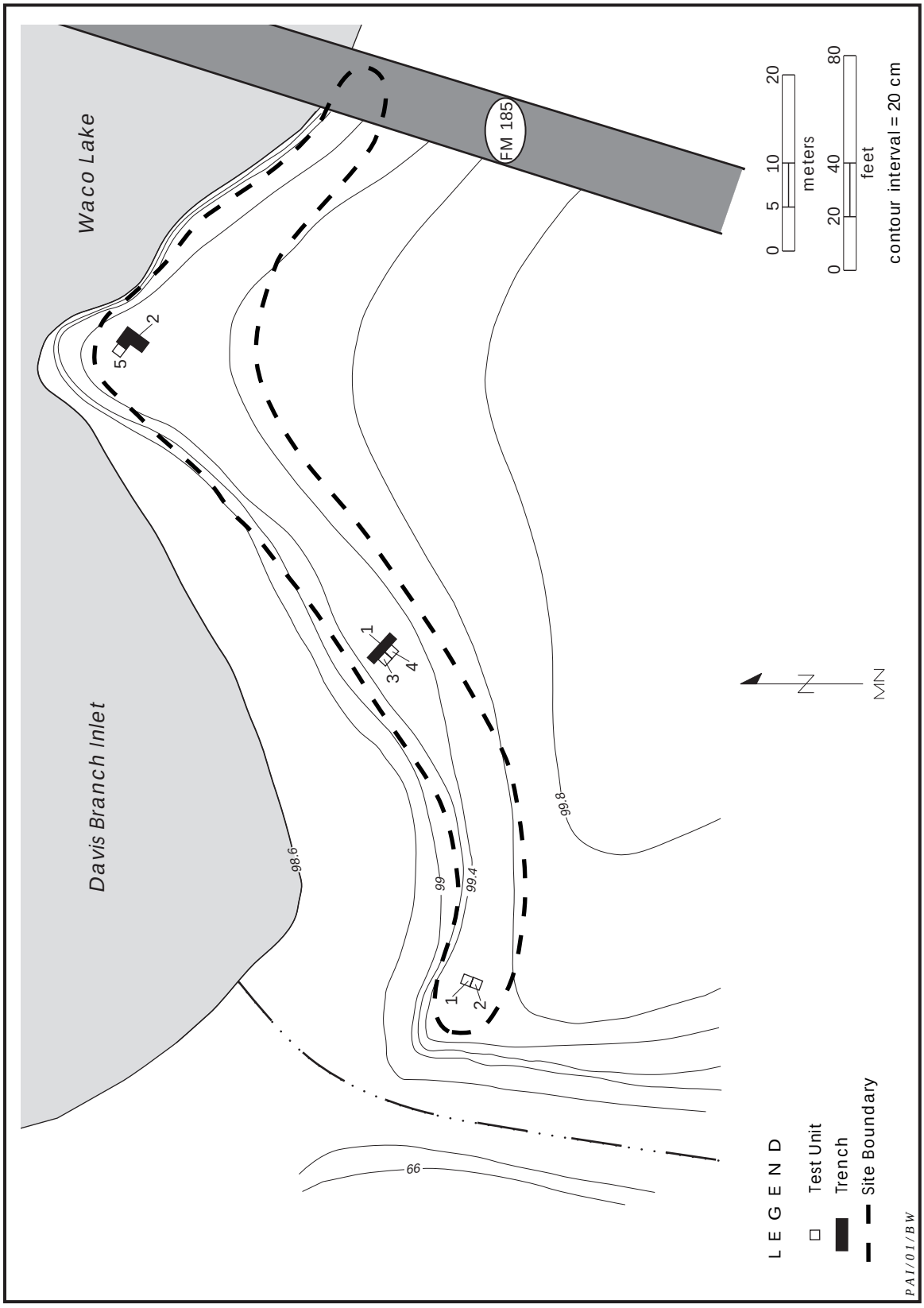

Figure 32. Map of 41ML185.

surface, and excavations ceased at Level 14 (230 cm). Finally, Test Unit 5 was placed over the burned rocks discovered in Trench 2. The overburden was removed by hand, and the first level began 90 cm below the modern ground surface. Excavation stopped when the water table was encountered at the base of Level 11 (200 cm). In total, 6.9 m³ were hand excavated.

Site Extent and Depth

In 1984, prehistoric materials were observed over a distance of ca. 220 m in the cutbanks east and west of the FM 185 bridge during low lake levels (Prikryl and Jackson 1985:236–237). A revisit in 1999 (Kvernes et al. 2000:59–60) noted that the portion of the site on the east side of the bridge had been impacted from the construction of a boat ramp and the FM 185 bridge and road maintenance activities. The current investigations focused on the ca. 100-m-long western portion of the site, west of the bridge, where relatively limited surface impacts were noted along the Davis Branch inlet of the lake.

The vertical extent of 41ML185 varies. The westernmost portion of the site near the unnamed Davis Branch tributary contains cultural materials between 1.0 and 1.7 m below the surface in Test Units 1 and 2. Excavations ceased in these units at 2 m below the surface after three sterile levels had been removed. The vertical extent of the site near the confluence of Davis Branch and the North Bosque River, however, is deeper. Cultural materials were encountered as deep as 2 m below the surface, as was the water table.

Sediments and Stratigraphy

The sediments and stratigraphy at 41ML185 were examined through the profiles and soil- stratigraphic descriptions of two trenches (see Appendix A). The site is situated on a Holocene alluvial terrace that, prior to the construction of Waco Lake, stood ca. 6 m above the North Bosque channel. Soils on the terrace surface belong to the Catalpa series (Templin et al. 1958). Catalpa soils are calcareous grayish brown to dark grayish brown clay loam to clayey soils formed on recent alluvium.

The terrace surface at 41ML185, which is located at the upper end of Waco Lake in the North Bosque valley, is blanketed by an almost 1-m-thick deposit of recent alluvium, the result of base level changes and back flooding since the construction of the lake (Figure 33). This recent deposit consists of alternating thin laminae to medium beds of pale brown very fine sand and dark gray mud. Tin and steel cans, plastic, and other modern debris were observed throughout this deposit. The recent alluvial deposit has essentially sealed off the prehistoric and early historic surface occupied by Native American groups in the past.

Alluvial deposits below the recent mantle are late Holocene in age and consist of silty clay loams imprinted with an Ab-Bwkb or Ab-Bwb soil profile. In Trench 1, the Ab horizon (94–154 cm) is a very dark grayish brown silty clay loam. A few pieces of charcoal were observed throughout the soil, which is moderately bioturbated (microfaunal burrowing). The underlying Bwkb horizon (154–254+ cm) is a yellowish brown silty clay loam displaying a moderate prismatic structure that breaks to a moderate angular blocky structure.

In Trench 2, the Ab horizon (80–125 cm) is a very dark grayish brown silty clay loam. Many freshwater mussel shell fragments, common burned rocks, and common pieces of charcoal were observed throughout the soil. A bulk soil sample collected at 101–109 cm yielded a conventional radiocarbon age of 1130 ± 80 B.P. (Beta-154295). The underlying Bwb horizon (125–300+ cm) is a yellowish brown silty clay loam. A few freshwater mussel shell fragments and burned rocks were observed at 148 and 239 cm below the surface. Both profiles suggest that the terrace surface aggraded rapidly throughout the late Holocene and then slowed around ca. 1100 B.P., facilitating the development of a thick, dark A horizon, which was occupied by late Late Archaic and Late Prehistoric groups.

Cultural Features

FEATURE 1

Feature 1 is a cluster of burned rocks and other cultural materials situated in the southeast corner of Test Unit 5, Levels 6 and 7 (146–157 cm). The feature originally was observed in the west wall of Trench 2. The excavated portion measures ca. 65 cm north-south by 40 cm east-west (Figure 34). The plan shape resembles

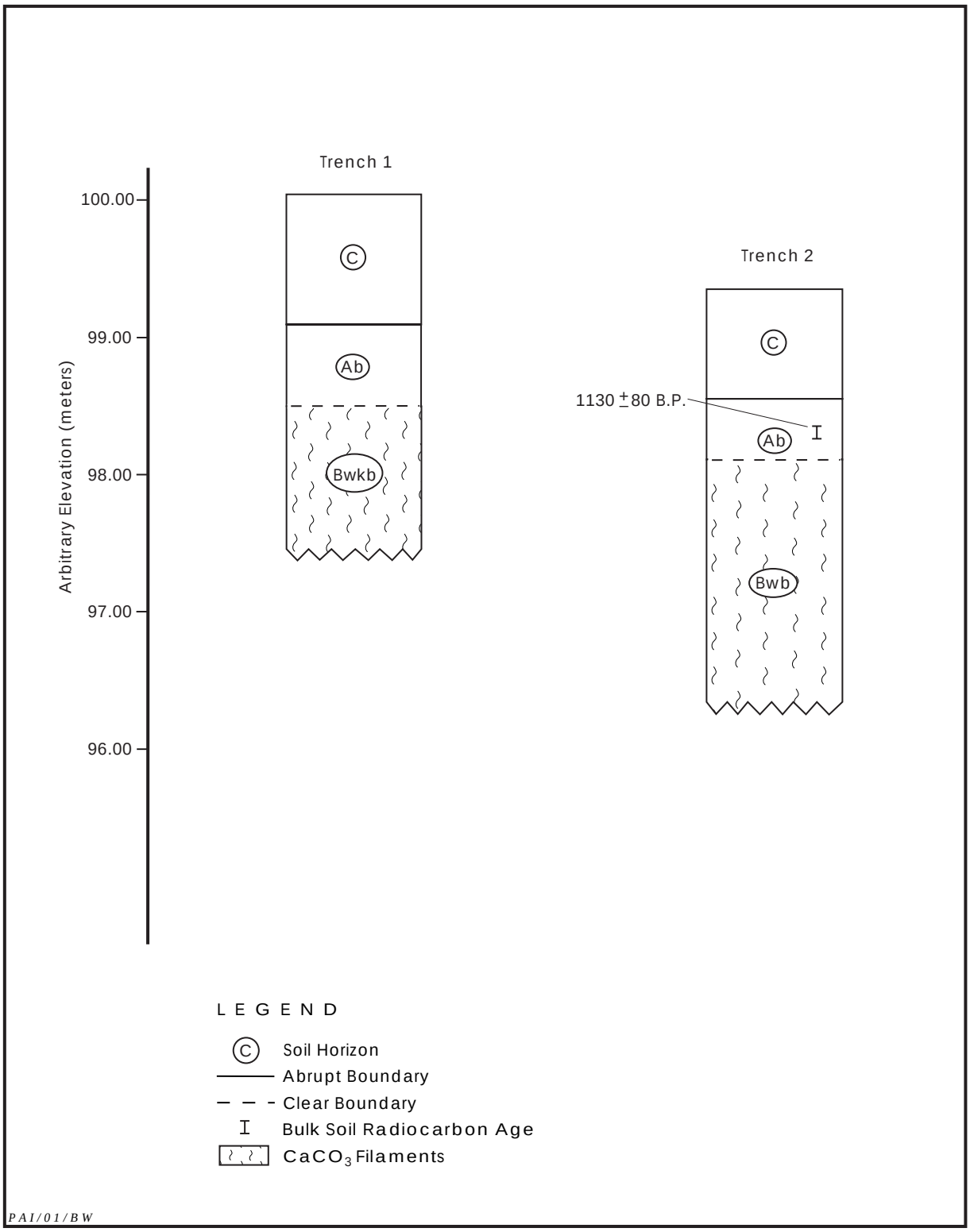

Figure 33. Profiles of Trenches 1 and 2, 41ML185.

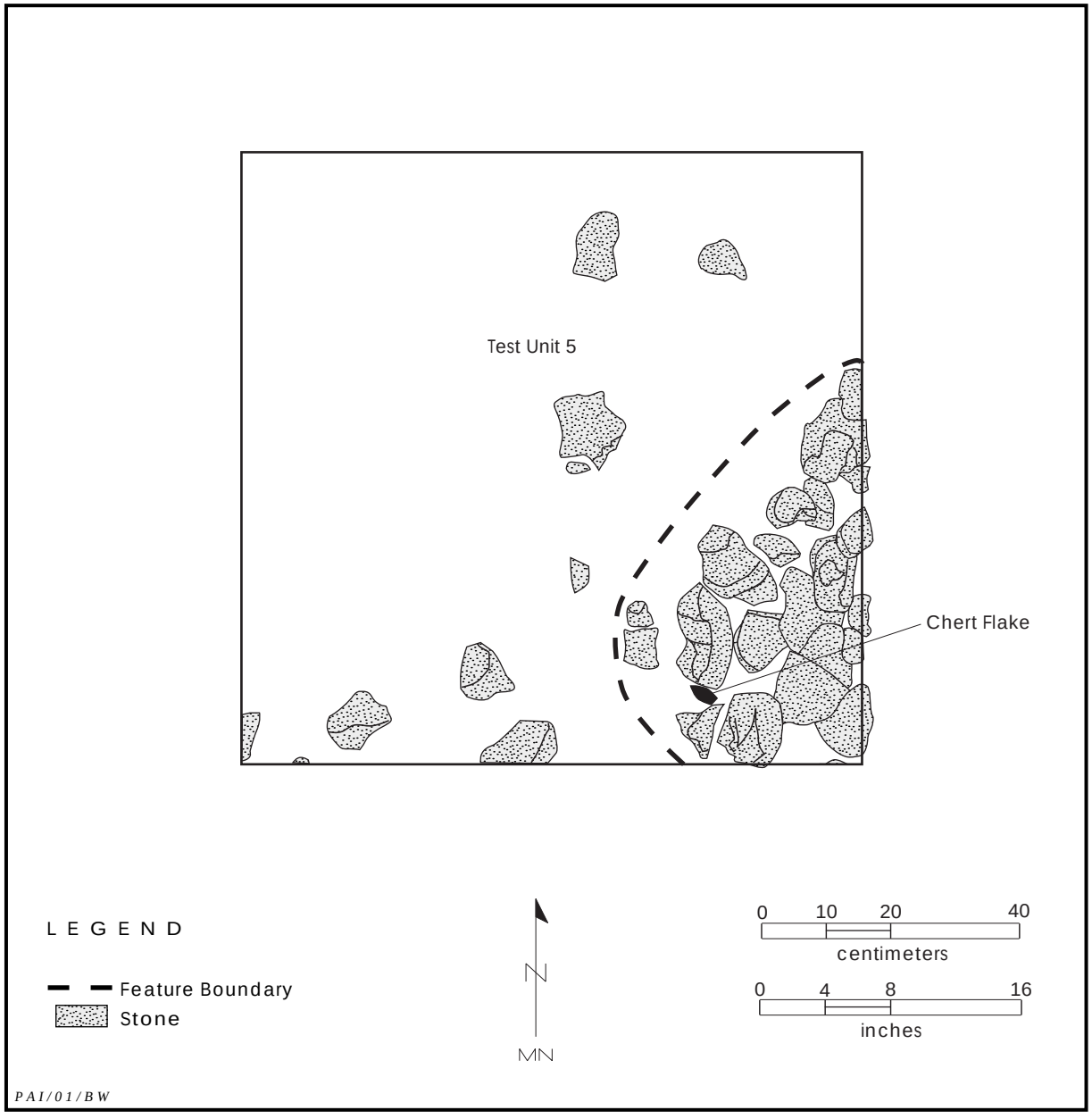

Figure 34. Plan of Feature 1, 41ML185.

a portion of an irregular circle. In cross section, the feature has no distinct shape and is rather flat. Mostly containing small burned rocks, the feature is ca. 11 cm thick. No charred materials or oxidized sediment were observed.

The feature contains ca. 39 burned rocks, 1 piece of lithic debitage, *Rabdotus* sp. shells, and mussel shells, some of which are burned. Some of the burned rocks are fractured in place and 1 fist-sized rock is not burned at all. In total, 8 kg of burned rocks were excavated. The rocks vary in size from ca. 20 cm to less than 5 cm and do not appear to be oriented in any particular direction. The feature may have been disturbed by bioturbation.

Approximately 4.5 liters of feature fill were collected for flotation. Flotation failed to recover any charred botanical remains; only burned

rocks, weighing less than 1 kg, 3 pieces of lithic debitage, and numerous mussel and snail shell fragments were recovered.

Feature 1 represents a portion of a larger burned rock feature, possibly a prepared hearth. Burned rocks present in the eastern wall of the trench at the same elevation suggest that the feature may have been even larger; thus, it appears that much of the feature was removed during trenching. Because only a portion of the feature was excavated, its exact size, morphology, and function are unclear.

FEATURE 2

Feature 2 is a small, loosely clustered group of burned rocks located in the northwest corner of Test Unit 5, Levels 7 and 8 (153–161 cm). The excavated portion measures ca. 30 cm north-south by 40 cm east-west (Figure 35). The plan shape is circular. It appears that only about one-quarter of the feature was encountered. In cross section, the feature slopes downward to the west, suggesting a basin-shaped bottom. The feature averages about 8 cm thick. No charred botanical or faunal remains or oxidized sediment were observed during excavation of the feature.

Feature 2 contains mainly burned rocks, however, *Rabdotus* sp. and mussel shell fragments were observed. Lithic debitage was collected outside the feature in the general level recovery. Sixteen burned rocks, all of which are less than 10 cm in size, were removed. In total, the burned rocks weigh 2.5 kg. The small size of the rocks suggests that they may have been heated multiple times and their usefulness exhausted. None of the rocks are fractured in place, and because of their loosely spaced arrangement, they may have been disturbed by bioturbation.

About 5.3 liters of feature fill were collected for flotation. Flotation recovered ca. 14 g of burned rocks, 3 pieces of lithic debitage, and numerous fragments of snail and mussel shells. No carbonized materials were recovered.

Feature 2 appears to have functioned as a prepared hearth pit based on the configuration of the rocks, gently sloping in cross section. Despite the lack of charred materials, the feature was probably a cooking device. Since only a portion of the feature was exposed, its actual size and function cannot be fully ascertained.

Materials Recovered

A total of 430 artifacts (426 chipped stone artifacts; 1 ground, pecked, and battered stone tool; and 3 pottery sherds), 209 invertebrate faunal specimens, and 24 vertebrate faunal remains were collected from 41ML185 (Table 12). Other materials include burned rocks, which were noted but not collected. Furthermore, assorted modern debris such as glass, nails, tin cans, and fishing tackle was found in a few of the levels (from the ground surface to ca. 100 cm) in Test Units 2–5. None of these materials were quantified or collected.

CHIPPED STONE ARTIFACTS

The chipped stone artifacts consist of 1 dart point, 6 bifaces, 1 uniface, 1 cobble tool, 21 pieces of edge-modified debitage, and 396 pieces of unmodified debitage.

Dart Point

One nearly complete dart point was found in Test Unit 3, Level 14 (220–230 cm) (Figure 36). It has a slender, triangular blade with straight margins, moderate unbarbed shoulders, and straight stem with a subtle expansion at the base. The blade is gently beveled showing some reworking, and the stem is beveled with moderately ground edges. A small part of the tip and a portion of the base are missing. Dimensions for the point are as follows: 66.7 mm for present length, 20.3 mm for blade width, 11.6 mm for neck width, 11.9 mm for base width, 14.2 mm for haft length, and 7.0 mm for thickness.

The point does not fall into a traditionally defined type; however, it closely resembles Provisional Type 1 (see 41ML162, Materials Recovered, for a more-detailed discussion of this type). As Kleinbach et al. (1999:337) suggest, these points were utilized ca. 3000–2000 B.C.

Bifaces

Six biface fragments, consisting of one proximal and three distal portions and two indeterminate edges, were collected. Only one biface tool type, a knife, could be identified. The remaining specimens are indeterminate fragments. Stages of reduction for the bifaces are

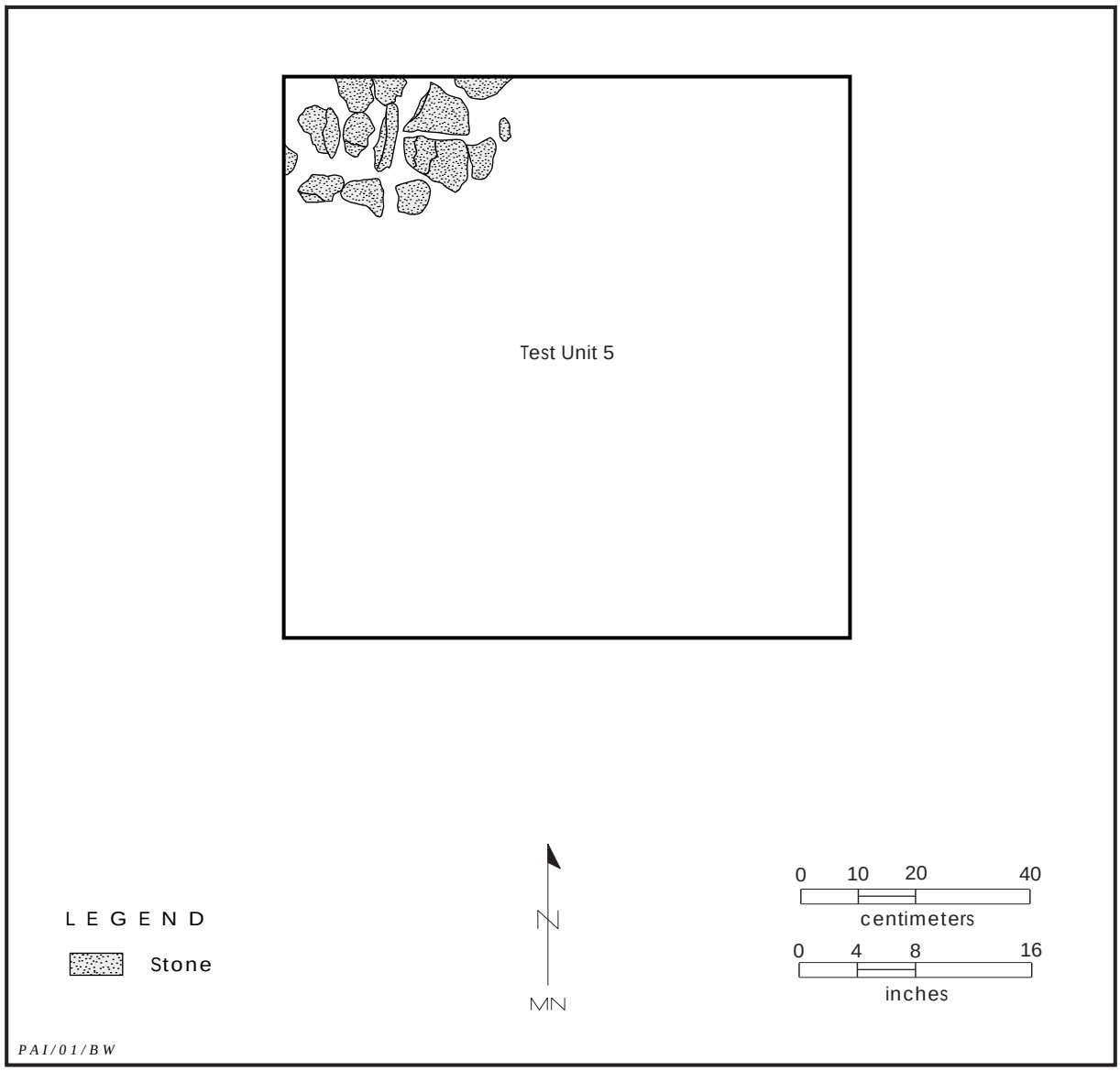

Figure 35. Plan of Feature 2, 41ML185.

early (n = 1), middle (n = 4), and finished (n = 1). Because of their fragmentary condition, only thickness and occasionally width could be measured. Provenience and metric data are presented in Table 13.

Uniface

One uniface, an intact end/side scraper, was recovered from Test Unit 2, Level 13 (120–130 cm). The specimen retains much cortex. Reworking on its distal end has created an almost graverlike tool with multiple, short protrusions at the scraping surface. Dimensions for the uniface are as follows: length, 48.2 mm; width, 31.3 mm; and thickness, 19.4 mm.

Cobble Tool

One cobble tool was collected from Test Unit 2, Level 14 (130–140 cm). It is a proximal fragment of a chopper with much use wear on one end. Cortex is present over most of the specimen. The tool is 51.9 mm long, 47.9 mm wide, and 23.7 mm thick.

Table 12. Summary of cultural materials from 41ML185

Provenience	Dart Point	Bifaces	Uniface	Cobble Tool	Edge-modified Debitage	Unmodified Debitage	Pottery	Ground/Pecked/ Battered Stone Tool	Unmodified Mussel Shells	Unmodified Bones	Totals
TEST UNIT 1											
Level 9 (80–90 cm)	–	–		–	–	–	–	–	–	3	3
Level 10 (90–100 cm)	–	–	–	–	–	2	–	–	1	–	3
Level 11 (100–110 cm)	–	–	–	–	3	–	2	–	3	1	9
Level 12 (110–120 cm)	–	–	–	–	–	1	–	–	1	–	2
Level 13 (120–130 cm)	–	–	–	–	1	–	–	–	1	–	2
Level 14 (130–140 cm)	–	–	–	–	1	7	–	–	3	–	11
Level 15 (140–150 cm)	–	–	–	–	–	3	–	–	1	13	17
Level 16 (150–160 cm)	–	–	–	–	–	7	–	–	–	–	7
Level 17 (160–170 cm)	–	–	–	–	–	2	–	–	1	–	3
Subtotals	0	0	0	0	5	22	2	0	11	17	57
TEST UNIT 2											
Level 11 (100–110 cm)	–	1	–	–	1	3	1	–	1	4	11
Level 12 (110–120 cm)	–	–	–	–	–	–	–	–	1	–	1
Level 13 (120–130 cm)	–	–	1	–	1	3	–	–	–	–	5
Level 14 (130–140 cm)	–	–	–	1	–	3	–	–	1	–	5
Subtotals	0	1	1	1	2	9	1	0	3	4	22
TEST UNIT 3											
Level 2 (100–110 cm)	–	–	–	–	1	2	–	–	1	–	4
Level 3 (110–120 cm)	–	–	–	–	1	9	–	–	1	1	12
Level 4 (120–130 cm)	–	–	–	–	–	5	–	–	2	–	7
Level 5 (130–140 cm)	–	1	–	–	–	5	–	1	4	1	12
Level 6 (140–150 cm)	–	–	–	–	–	7	–	–	7	–	14
Level 7 (150–160 cm)	–	1	–	–	–	5	–	–	8	–	14
Level 8 (160–170 cm)	–	–	–	–	–	1	–	–	–	–	1
Level 9 (170–180 cm)	–	–	–	–	–	4	–	–	1	–	5
Level 10 (180–190 cm)	–	–	–	–	1	–	–	–	–	–	1
Level 11 (190–200 cm)	–	–	–	–	–	2	–	–	3	–	5
Level 12 (200–210 cm)	–	–	–	–	–	2	–	–	3	–	5
Level 13 (210–220 cm)	–	–	–	–	–	1	–	–	2	–	3
Level 14 (220–230 cm)	1	–	–	–	1	–	–	–	–	–	2
Subtotals	1	2	0	0	4	43	0	1	32	2	85
TEST UNIT 4											
Level 1 (90–100 cm)	–	–	–	–	–	–	–	–	1	–	1
Level 2 (100–110 cm)	–		–	–	–	17	–	–	8	–	25
Level 3 (110–120 cm)	–	1	–	–	1	11	–	–	2	–	15
Level 4 (120–130 cm)	–	1	–	–	–	7	–	–	3	–	11
Level 5 (130–140 cm)	–	–	–	–	–	7	–	–	1	–	8
Level 6 (140–150 cm)	–	–	–	–	1	1	–	–	5	–	7
Level 7 (150–160 cm)	–	–	–	–	–	3	–	–	9	–	12
Level 8 (160–170 cm)	–	–	–	–	–	2	–	–	1	–	3
Level 11 (190–200 cm)	–	–	–	–	–	–	–	–	1	–	1
Level 12 (200–210 cm)	–	–	–	–	–	–	–	–	1	–	1

Table 12, continued

Provenience	Dart Point	Bifaces	Uniface	Cobble Tool	Edge-modified Debitage	Unmodified Debitage	Pottery	Ground/Pecked/ Battered Stone Tool	Unmodified Mussel Shells	Unmodified Bones	Totals
Level 13 (210–220 cm)	–	–	–	–	–	4	–	–	2	–	6
Level 14 (220–230 cm)	–	–	–	–	–	5	–	–	1	–	6
Subtotals	0	2	0	0	2	57	0	0	35	0	96
TEST UNIT 5											
Level 2 (100–110 cm)	–	–	–	–	–	1	–	–	–	–	1
Level 3 (110–120 cm)	–	–	–	–	2	12	–	–	9	–	23
Level 4 (120–130 cm)	–	–	–	–	1	32	–	–	3	1	37
Level 5 (130–140 cm)	–	1	–	–	–	123	–	–	14	–	138
Level 6 (140–150 cm)	–	–	–	–	3	75	–	–	29	–	107
Feature 1 (146–157 cm)	–	–	–	–	–	3	–	–	5	–	8
Level 7 (150–160 cm)	–	–	–	–	1	7	–	–	22	–	30
Feature 2 (150–160 cm)	–	–	–	–	–	3	–	–	3	–	6
Level 8 (160–170 cm)	–	–	–	–	–	5	–	–	13	–	18
Level 9 (170–180 cm)	–	–	–	–	–	2	–	–	20	–	22
Level 10 (180–190 cm)	–	–	–	–	1	1	–	–	9	–	11
Level 11 (190–200 cm)	–	–	–	–	–	1	–	–	1	–	2
Subtotals	0	1	0	0	8	265	0	0	128	1	403
TOTALS	1	6	1	1	21	396	3	1	209	24	663

Edge-modified Debitage

Twenty-one pieces of edge-modified debitage were identified. Forty-three percent (n = 9) are complete flakes, 24 percent (n = 5) are proximal fragments, 24 percent (n = 5) are chips, and 9 percent (n = 2) are chunks. Over half have cortex. Most have either one modified edge (n = 10) or two modified edges (n = 9). The remaining 2 pieces show three worked edges. None of the specimens is smaller than 2 cm in size. The 19 flakes with one or two modified edges range in size from 2 to 4 cm. The two pieces with three worked edges are 4–6 cm in size. Raw material colors range from light brown—the material most common—to light and dark gray cherts.

Unmodified Debitage

A total of 396 pieces of unmodified debitage were collected. Of those flakes, 25 percent (n = 100) are complete, 34 percent (n = 134) are proximal fragments, 34 percent (n = 133) are chips, and 7 percent (n = 29) are chunks. Cortex is absent on 61 percent (n = 243) of the assemblage. Only 8 flakes have 100 percent dorsal cortex. These flakes range from less than 1 cm in size to 7 cm. Sixty-four percent (n = 253) are 1–2 cm. The second-most-frequent size range is 2–3 cm, represented by 22 percent (n = 86). Seven percent (n = 30) are less than 1 cm in size, and, 7 percent (n = 27) are 3–7 cm in size. Raw material colors vary from light brown to light mottled gray and dark gray chert. A very dark gray to almost black material was noted. Numerous flakes display a pinkish hue from thermal alteration. A few pieces of irregularly banded dark brown and gray chert also were observed.

INVERTEBRATE FAUNAL REMAINS

Thirty-five of the 209 mussel shells collected are complete enough for taxonomic identification

Figure 36. Dart point from 41ML185.

(see Appendix B). The taxa include *Amblema plicata*, *Leptodea fragilis*, *Quadrula petrina*, *Quadrula* sp., and *Tritogonia verrucosa*. The species *A. plicata* (threeridge mussel) is the most common.

VERTEBRATE FAUNAL REMAINS

Of the 24 bone fragments recovered, 23 were analyzed (see Appendix C). The remaining unanalyzed bone fragment was inadvertently left out of the analysis. This specimen is burned and less than 2 cm in size. Although no species were identified in the assemblage, deer probably makes up most of the collection, as one Artiodactyla (medium- or goat/deer-sized) specimen was identified and the remaining fragments are medium-sized/large (canid/deer-sized) Mammalia (n = 17) or Vertebrata (n = 5). Only one specimen is calcined.

OTHER MATERIALS

Other materials recovered consist of burned rocks; three pottery sherds; and one ground, pecked, and battered stone tool. As noted above, ca. 55 burned rocks were found in Features 1 and 2. In addition, scattered burned rocks were found occasionally in nonfeature contexts. The presence of these rocks was noted, but they were not quantified.

Pottery

Three pieces of prehistoric pottery were found. Two crossmend and were analyzed as one piece (Figure 37). This specimen is a 3–4-cm body sherd equally burnished on the interior and exterior. The exterior is decorated with incised lines and a crosshatched field. The sherd is bone tempered and 6.6 mm thick. Although it resembles Caddoan-style vessels with its zoned crosshatched decoration, the small size of the sherd and the amount of decoration present are insufficient for assigning a specific type origin. Found in the same level in the adjacent unit, the third piece of pottery may be from the same vessel. It is a small (1–2 cm), bone-tempered, undecorated sherd. Both the interior and exterior surfaces are burnished. The sherd is 5.6 mm thick.

Ground, Pecked, and Battered Stone Tool

A ground, pecked, and battered stone tool was recovered from Test Unit 3, Level 5 (130–140 cm). The limestone specimen is oblate or disk shaped with an 85.5-mm-long by 15.0-mm-wide worn surface on one of the margins. It measures 95.4x88.9x35.5 mm and weighs 357.0 g.

Chronology and Components

Based on the distribution of cultural materials, features, and radiocarbon ages, two components are defined for 41ML185. The first contains a mix of Late Archaic and Late Prehistoric cultural materials recovered from the buried A horizon, though no unambiguous diagnostic artifacts were recovered. The presence of a Late Prehistoric occupation is based on the recovery of pottery from Test Units 1 and 2. It is possible that the Late Prehistoric constituent of this component represents a Toyah phase occupation based on a radiocarbon age of 160 ± 50 B.P. (Beta-154286) on charcoal from Test Unit 4, Level 4 (120–130 cm). The radiocarbon age produces a two-sigma calibrated date range of 300 (270, 200, 150, 20, 0) 0 B.P., which overlaps temporally with the end of the Toyah phase. This date should be viewed with caution, however, because of deviations and

Table 13. Provenience and metric data for bifaces from 41ML185

Provenience	Tool Type	Stage of Reduction	Completeness	Maximum Length	Maximum Width	Maximum Thickness
TEST UNIT 2						
Level 11 (100–110 cm)	indeterminate	middle	edge	–	–	4.9
TEST UNIT 3						
Level 5 (130–140 cm)	indeterminate	finished	edge	–	–	–
Level 7 (150–160 cm)	knife	middle	proximal	–	32.0	6.8
TEST UNIT 4						
Level 3 (110–120 cm)	indeterminate	middle	distal	–	21.8	6.1
Level 4 (120–130 cm)	indeterminate	middle	distal	–	–	10.0
TEST UNIT 5						
Level 5 (130–140 cm)	indeterminate	early	distal	–	39.4	17.8

Note: All measurements are in millimeters.

Figure 37. Prehistoric pottery sherd from 41ML185.

imprecision in the calibration curve over this time span. A second radiocarbon age of 1130 ± 80 B.P. on soil humates from the buried A horizon indicates that the ca. 45–60-cm-thick soil emcompasses a large interval of time and probably includes cultural materials that predate the Late Prehistoric period. A third radiocarbon age on charcoal ca. 30 cm below the humate date produced a modern radiocarbon age (Beta-154285). This suggests that, although the A horizon is thick and cumulic in nature, the cultural materials within it are mixed. It appears that the component has been disturbed either by bioturbation or some other means. Late Prehistoric materials cannot be separated stratigraphically from Late Archaic materials, and thus isolating smaller temporal components within the A horizon is not possible.

The second component is more discrete but of unknown age. The presence of the Provisional Type 1 dart point suggests a late Middle Archaic to early Late Archaic age for this component. Previous investigations in central Texas imply that this point style was used by hunters and gatherers around 3000–2000 B.C. (see Kleinbach et al. 1999). No radiometric data are available from 41ML185 to provide chronological support. Cultural materials associated with this component were recovered from a 40-cm-thick deposit in Test Units 3 and 4, Levels 11–14 (190–239 cm). These materials consist of 1 dart point, 1 edge-modified flake, 14 pieces of unmodified debitage, 23 mussel shell fragments, and scattered burned rocks. A few isolated burned rocks were observed at 239 cm in the profile of Trench 2. Given the small amount of artifacts, few interpretations can be given. Nonetheless, it is likely that chipped stone tool production, hunting, and game processing are represented by this component.

Summary and Assessment

Test excavations at 41ML185 discovered 430 artifacts and other cultural materials, including a dart point and pottery, and two burned

rock features. Based on the distributions of these materials and radiocarbon ages, two components are defined. The later component is Late Archaic to Late Prehistoric in age. Prehistoric pottery sherds are associated with this component and may or may not represent a Toyah phase occupation. These Late Prehistoric artifacts cannot be separated from the Late Archaic materials. The earlier component contains few artifacts and is undated, but it probably dates to the late Middle Archaic to early Late Archaic periods. Comparatively, the earlier component is more discrete, appears to have good contextual integrity, and likely could contribute important information. For these reasons, it is recommended that 41ML185 be considered eligible for listing in the National Register of Historic Places.

Site 41ML186

Description

Prehistoric site 41ML186 is situated on the southern bank of the North Bosque River at the bend near the old Eichelberger Crossing bridge (see Figure 4). The site is located about 100 m south of the north bank, where Spring Branch and the North Bosque River meet. Surface elevation is approximately 470 ft. Vegetation includes oak, elm, pecan, and juniper trees with various shrubs and greenbriers making up the understory.

Previous Investigations

Site 41ML186 was first located during the geomorphological and archeological surveys conducted in 1984 (Prikryl and Jackson 1985:96–98, 237–238). The lake level was 10 ft below normal when the site was first discovered and 5 ft below normal when the archeological crew returned to formally record the site. An examination of the cutbank revealed that the site extended for approximately 50 m, with most of the cultural materials in a 10–12-m-long stretch at the southwestern end. Two lenses of cultural materials were observed in this area. The first consisted of burned rocks, mussel shells, and charcoal at a depth of ca. 2.9 m below the ground surface, while the second consisted of a basin-shaped hearth and a 15-cm-thick zone with burned rocks, mussel shells, and charcoal at ca. 3.6 m. Another possible feature consisting of a thin lens of burned sediment was noted at ca. 4.2 m. No artifacts were located within any of the lenses.

Site 41ML186 was revisited by boat as part of a site re-location and reassessment effort in 1999 (Kvernes et al., 2000:60–61). An examination of the 4.5-m-high cutbank was limited by dense vegetation. However, the examination did reveal a 20–30-cm-thick lens of mussel shells, burned rocks, and charcoal ca. 3 m below the surface. No shovel tests were excavated because of the deeply buried materials.

Work Accomplished

During the 2000–2001 investigations, a long rebar stake was used as the primary datum and was given an arbitrary elevation of 100.00 m. The datum was placed near a large oak tree ca. 10 m west of the cutbank edge and ca. 4 m north of Trench 2. A second datum (rebar) was placed 18 m east of Trench 3.

Five trenches were excavated (Figure 38). Trench 1 in the northern part of the site was oriented at 336° and measured 4.1x2.5x3.5 m. An examination of the trench revealed a few small pieces of charcoal scattered between 83 and 104 cm and one mussel shell fragment at 204 cm. Aligned at 314°, Trench 2 was ca. 13 m southwest of Trench 1. It measured 4x2.5x3.7 m and contained no cultural materials. Cultural materials also were not seen in Trench 3, which was aligned at 324°, measured 4x2.7x3.7 m, and was located 13 m southwest of Trench 2. Trench 4 (2.8x2.1x1.9 m) was placed 25 m south of Trench 3, and Trench 5 (4x2.8x3.5 m) was located 21 m southwest of Trench 4. Neither Trench 4 nor 5 contained cultural materials. They were located in the southern part of the site at an orientation of 304° and 302°, respectively.

Four test units were excavated. Test Units 1 and 2 were placed on the southwest side of Trench 1. The first level in each unit began ca. 80 cm below the modern ground surface, near the bottom of the recent alluvial cap. Excavations were terminated at Level 30 (380 cm). Test Units 3 and 4 were placed on the southwest side of Trench 2. The first levels in these units began at 75 cm below the surface, and the excavations ceased at Level 31 (385 cm). In total, 12.2 m^3 of fill were excavated.

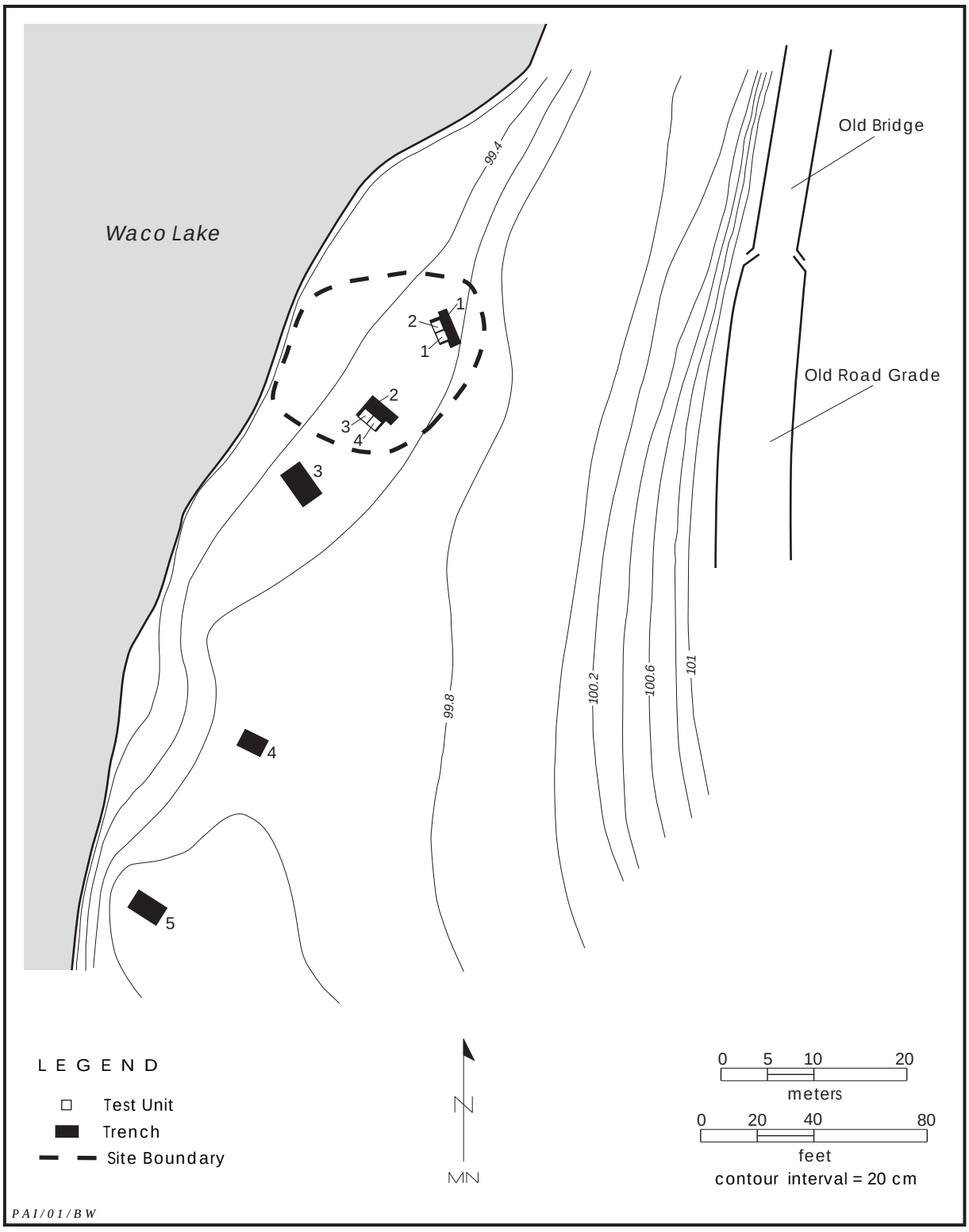

Figure 38. Map of 41ML186.

Site Extent and Depth

In 1984, cultural materials (i.e., bones, burned rocks, mussel shells, and charcoal) were observed at depths of 2.9, 3.6, and 4.2 m below the ground surface along a 50–60 m stretch of cutbank (Prikryl and Jackson 1985:96–98, 237–238). During the revisit in 1999 (Kvernes et al. 2000:60–61), only a 20–30-cm-thick lens of burned rocks, mussel shells, and charcoal at ca. 3 m below the surface was identified. The trenches and test units excavated in 2000–2001 did not encounter any of the cultural zones mentioned above, only sparsely scattered cultural materials at 1.75–3.65 m (the water table was reached at 3.80–3.85 m). The remaining cultural deposits appear to be located in the northern part of the site area as originally defined, covering an estimated area of 20x20 m. It appears that most of the site has been lost to erosion by the North Bosque River.

Sediments and Stratigraphy

The sediments and stratigraphy at 41ML186 were examined through the profiles of five trenches and descriptions of the soil stratigraphy of three of the trench profiles (see Appendix A). The site is situated on a Holocene alluvial terrace that stands ca. 4–5 m above the North Bosque channel. Soils on the terrace surface belong to the Catalpa series (Templin et al. 1958). Catalpa soils are calcareous grayish brown to dark grayish brown clay loam to clayey soils formed on recent alluvium.

As at other localities examined along the North Bosque River, the terrace at 41ML186 is mantled by a deposit of recent unmodified alluvium. This alluvial cap is 30–58 cm thick and consists of alternating horizontal beds and laminae of yellowish brown sand and grayish brown to dark grayish brown mud (Figure 39). It is estimated that these sediments postdate Euro-American settlement with the drainage basin. The underlying terrace deposits consist of channel fill and floodplain facies with multiple soil imprints. The degree of soil development throughout these deposits suggests that they are late Holocene in age.

Channel fill facies, observed in the profile of Trench 5, exhibit an upward-fining sequence. These deposits display an Ab-C-2Ab-2Bb soil profile. The Ab horizon (55–120 cm) is a dark grayish brown sandy clay loam containing a few poorly preserved thin sand beds. The C horizon (120–254 cm) is an unmodified brown silt loam also containing a few poorly preserved sand beds. A second soil is imprinted on the underlying deposits. The 2Ab horizon (254–288 cm) is a dark grayish brown silty clay loam with a thin gravel bed at 276 cm, while the underlying 2Bb horizon (288–352+ cm) is a very gravelly silty clay. Granule- to cobble-sized, rounded to subrounded gravels increase in frequency between 324 and 352+ cm.

Overbank facies are represented in the profile of Trench 1 and display multiple soils. Trench 1 exhibits an AC-Ab-C-2Ab-2Bkb soil profile. The AC horizon (30–83 cm) is a brown fine sandy clay loam. The Ab horizon (83–104 cm) consists of a grayish brown silty clay, while the C horizon (104–140 cm) is a brown fine sandy clay loam. The lowest buried soil (2Ab-2Bkb) consists of a dark grayish brown silty clay overlying a brown silty clay loam with common $CaCO_3$ filaments.

Materials Recovered

Few cultural materials were recovered from 41ML186: 2 chipped stone artifacts, 17 invertebrate faunal remains, and 4 burned rocks. None of the test units encountered any cultural features.

CHIPPED STONE ARTIFACTS

Two pieces of unmodified lithic debitage were found. One is from Test Unit 3, Level 12 (185–195 cm). It is a complete flake 2–3 cm in size with some dorsal cortex present. The second piece of debitage is from Test Unit 4, Level 11 (175–185 cm). It is a proximal fragment measuring 3–4 cm in size and is completely covered with cortex on the dorsal surface.

INVERTEBRATE FAUNAL REMAINS

Of the 17 mussel shell fragments recovered, only 5 specimens are identifiable (Table 14) (see Appendix B). The remaining 12 pieces are too eroded or fragmented for identification.

OTHER MATERIALS

Two small burned rocks were observed in

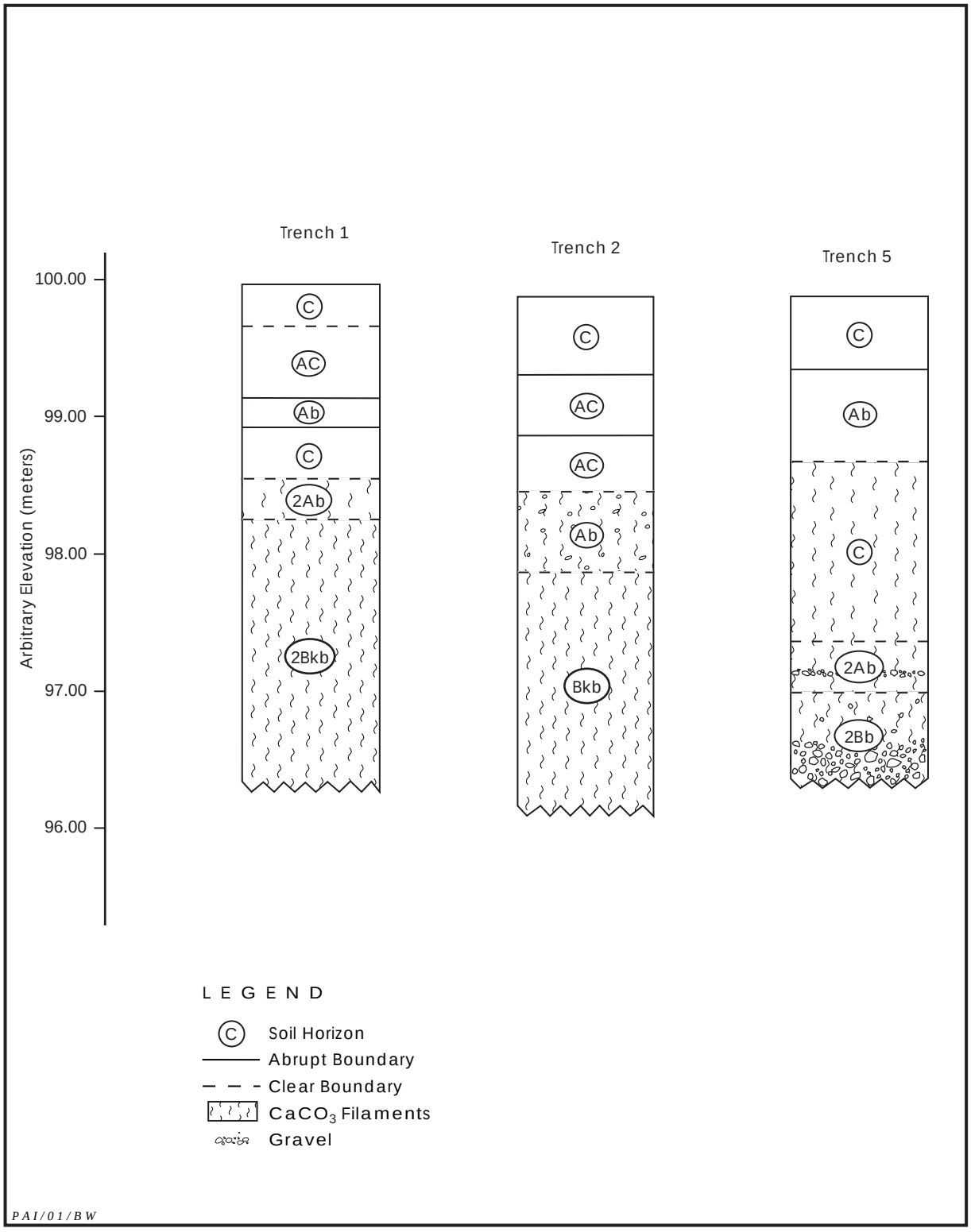

Figure 39. Profiles of Backhoe Trenches 1, 2, and 5, 41ML186.

Table 14. Provenience of mussel shells from 41ML186

Provenience	Quantity	Identification
TEST UNIT 1		
Level 12 (190–200 cm)	3	Unidentified
TEST UNIT 2		
Level 11 (180–190 cm)	1	Unidentified
TEST UNIT 3		
Level 11 (175–185 cm)	2	Unidentified
Level 13 (195–205 cm)	1	*Quadrula* sp.
Level 14 (205–215 cm)	1	*Cyrtonaisas tampicoensis*
Level 15 (215–225 cm)	1	Unidentified
TEST UNIT 4		
Level 12 (185–195 cm)	1	*Tritogonia verrucosa*
Level 15 (215–225 cm)	2	Unidentified
Level 27 (335–345 cm)	1	*Quadrula petrina*
Level 28 (345–355 cm)	1	*Quadrula* sp.
Level 29 (355–365 cm)	3	Unidentified
TOTAL	17	

Test Unit 2, Level 13 (200–210 cm); and two were noted in Test Unit 4, Levels 28–29 (345–365 cm). Collectively, the burned rocks weigh less than 1 kg.

Chronology and Components

The cultural chronology of 41ML186 is based on the distribution of few cultural materials closely related in space. Carbon samples collected from the site were insufficient for radiocarbon dating, and no diagnostics were recovered. Nevertheless, an undated component is present between 175 and 365 cm, based on the recovery of two flakes, four burned rocks, and mussel shells.

Summary and Assessment

Site 41ML186 is an undated prehistoric site situated on the south bank of the North Bosque River. Little material was recovered from testing, and much of the site appears to have been lost to erosion. The site lacks the capacity to yield important information. Therefore, it is recommended that 41ML186 be considered ineligible for listing in the National Register of Historic Places.

Site 41ML194

Description

Site 41ML194 is a prehistoric site situated on the eastern bank of the North Bosque River upstream from the upper end of Waco Lake (see Figure 4). The area around the site is a terrace between the modern channel to the west and an old partially filled channel to the east-northeast. A small unnamed drainage is opposite the site on the west side of the river. The current ground surface is at an elevation of ca. 470 ft. Vegetation in the area includes oak, pecan, elm, and juniper trees with a thick understory of greenbriers and various shrubs.

Previous Investigations

Site 41ML194 was located and recorded in 1984 (Prikryl and Jackson 1985:245–246). During a boat survey, burned rocks, mussel shells, and bone fragments were noted at depths of 3.0 to 3.75 m along ca. 85 m of cutbank. Approximately 3 m below the surface, a 10-cm-thick lens of horizontally bedded silt, clay, and gravel was noted as containing the majority of the cultural materials. Above the lens, clay or clay loam deposits were bedded horizontally. Beneath this lens, dipping beds of clay, silt, and gravel suggesting channel filling were observed; sparse, probably redeposited cultural materials were observed in these lower deposits.

As part of a revisitation and reassessment effort in 1999, 41ML194 was re-located by boat and the cutbank was reexamined (Kvernes et al. 2000:64–65). A lens of mussel shells and burned rocks was noted along a ca. 50-m section of the cutbank around the same depth recorded in 1984. No shovel tests were excavated because of the deeply buried materials.

Work Accomplished

During the 2000–2001 investigations, a long rebar stake was used as the primary datum and was given an arbitrary elevation of 100.00 m. The datum was placed near a large pecan tree

a few meters east of the cutbank edge and south of Trench 2. A second datum (rebar) was placed 12 m north between Trenches 1 and 2.

Six trenches were excavated (Figure 40). Trench 1 (4.9x2.5x3.5 m), placed to the north of the site, was oriented at 60° and encountered gravels at ca. 200 cm. Trench 2, located 19 m southeast of Trench 1, measured 6.6x3.5x3.3 m and was oriented at 70°. A thin gravel bed was encountered at 314 cm. About 12 m southwest of Trench 2, Trench 3 was oriented at 120° and measured 4.7x3.4x2.6 m. A burned surface was noted in the profile at 206 cm. Furthermore, a thin lens of oxidized sediment, charcoal, and ash was observed at 217 cm. No cultural materials were observed in the burned lenses. Trench 4 (7.4x3.0x3.3 m) was 26 m south of Trench 3 and was oriented at 100°. Twenty-five meters to the southwest lies Trench 5, oriented at 116° and measuring 7.5x4.0x3.3 m. Finally, Trench 6 (oriented at 102°) was placed in an area where the nearby cutbank showed a deeply buried lens of gravel and mussel shells. The trench measured 8.6x3.0x3.3 m but failed to encounter the deeply buried lens or yield any cultural materials. A bulk sediment sample for radiocarbon dating was collected from the wall at 114–122 cm.

Six test units were placed at 41ML194. Test Units 1 and 2 were on the north side safety bench of Trench 2. The upper 130 cm in these units were discarded without screening because they appeared to be culturally sterile. These units were taken to Level 9 (220 cm) before efforts were redirected to focus on potentially better areas of the site. Test Units 3 and 4 were on the south side safety bench of Trench 3. The first levels began 150 cm below the modern ground surface. The units were situated over Feature 1, the thin lens of oxidized sediment, charcoal, and ash observed at 217 cm. Excavations were halted at Level 23 (380 cm). Finally, Test Units 5 and 6, which examined the southern portion of the site area where cutbank exposures showed mussel shells, were on the south side safety bench of Trench 6. The first levels in these units began at 135 cm below the modern ground surface. Excavations were concluded at Level 24 (375 cm). A total of 11.2 m^3 of fill were hand excavated at 41ML194.

Site Extent and Depth

Site 41ML194 originally was discovered in the cutbank of the North Bosque River during a boat survey in 1984 (Prikryl and Jackson 1985:245–246). Cultural materials such as burned rocks, mussel shells, and bone fragments were recorded along an 85-m stretch of the cutbank at depths of 3.0 to 3.75 m. The few cultural materials observed in the cutbank and recovered in the trenches and test units in 2000–2001 indicate a north-south dimension of ca. 100 m and an east-west dimension of 10 m or less. Apparently, most of the site has eroded away. Archeological materials were documented from ca. 2.0 m to 3.75 m below the surface.

Sediments and Stratigraphy

The sediments and stratigraphy at 41ML194 were examined through the profiles of six trenches and descriptions of the soil stratigraphy of three of the trench profiles (see Appendix A). The site is situated on a Holocene alluvial terrace that stands ca. 7 m above the North Bosque channel. Portions of the terrace cutbank appear to have slumped recently. Soils on the terrace surface belong to the Catalpa and Patrick series (Templin et al. 1958). Catalpa soils are calcareous grayish brown to dark grayish brown clay loam to clayey soils formed on recent alluvium, while Patrick soils are shallow, calcareous, dark brown to dark grayish brown clayey alluvial soils overlying limestone gravels.

Trench exposures reveal that the terrace is a composite of channel margin (levee and crevasse splay) and interchannel floodbasin (floodplain) facies. Multiple soils are imprinted on these deposits, and the soil stratigraphy is fairly consistent across the site (Figure 41). The site is mantled by a thin (ca. 16–18 cm) deposit of brown to grayish brown silty clay that is pedogenically unmodified, suggesting that it was deposited recently. Levee and crevasse splay deposits consisting of alternating beds of fine to coarse quartz sand and dark silty clay underlie the recent mantle. These deposits range from 69 cm thick in Trench 6 to 286 cm thick in Trench 2, with some displaying multiple buried soils. Floodplain deposits underlie the levee and crevasse splay deposits at depths of 85 to 304 cm below the surface. These deposits consist of dark silty clay loams imprinted with A or A-Bw-B soil profiles.

The profile of Trench 6 is typical of the previously noted sequence. A recent unmodified

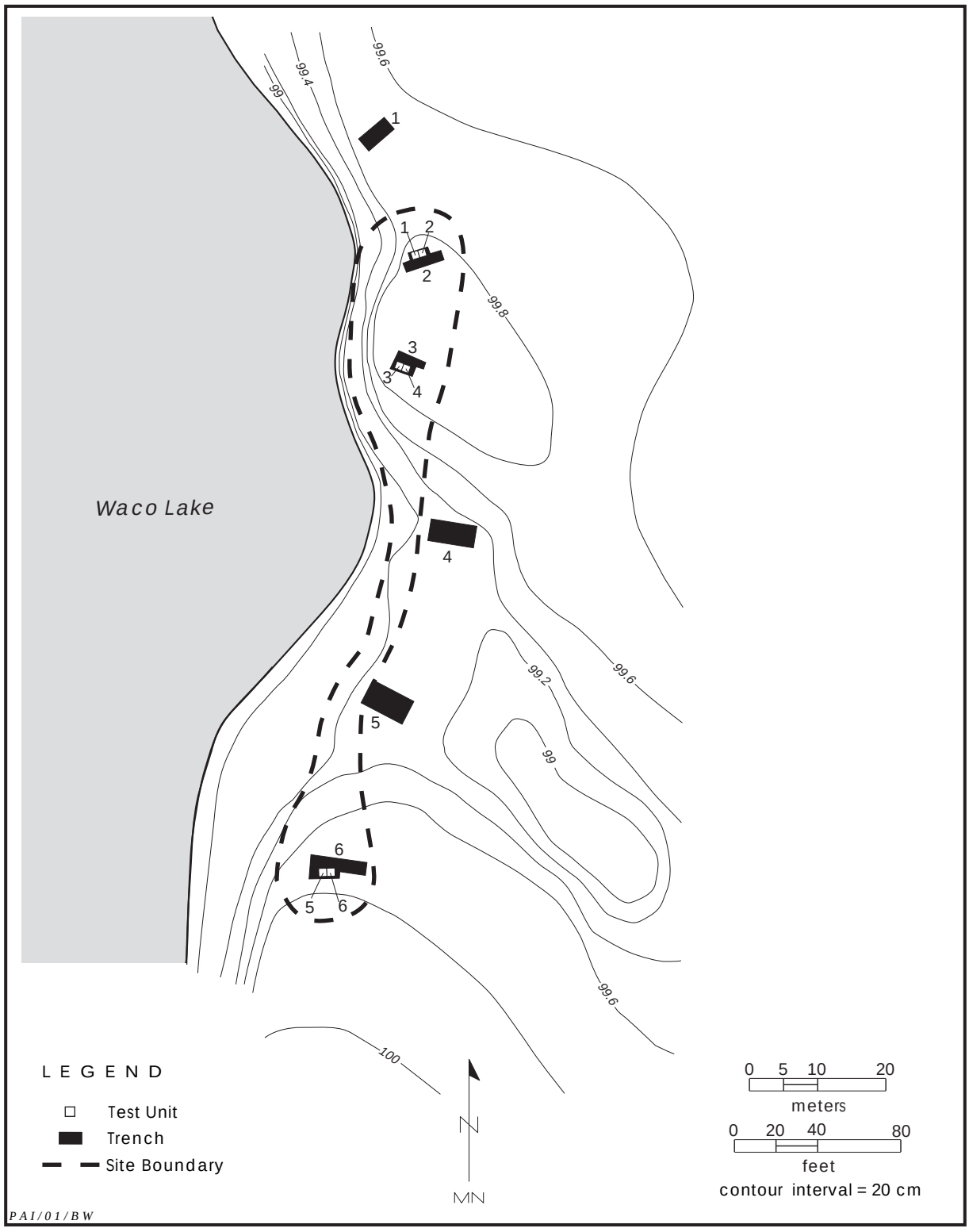

Figure 40. Map of 41ML194.

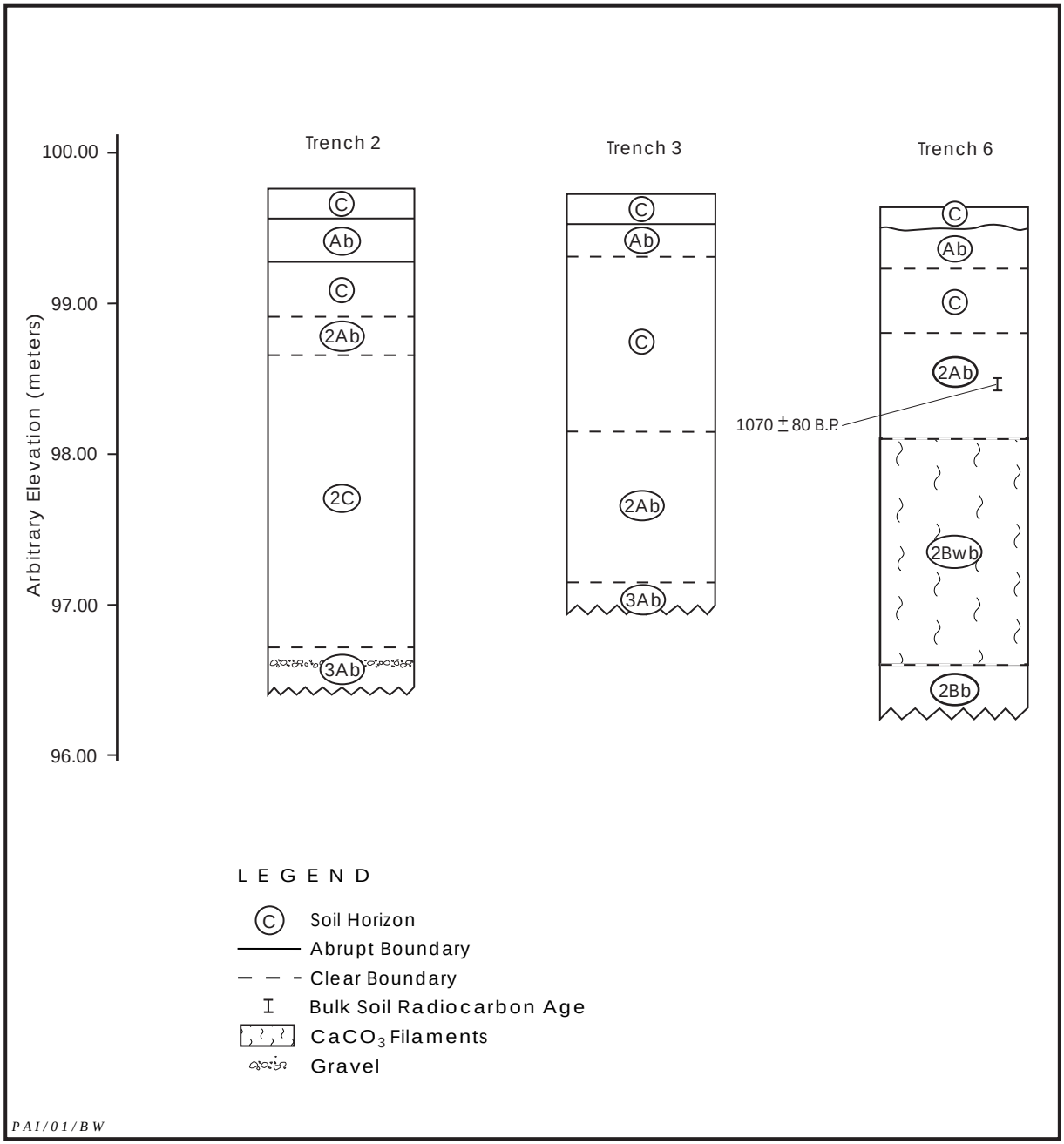

Figure 41. Profiles of Trenches 2, 3, and 6, 41ML194.

alluvial deposit of brown silty clay (0–16 cm) caps the soil-stratigraphic profile. A thin bed of fine to medium sand marks the wavy boundary between it and the underlying levee deposit. The levee deposit (16–85 cm) is imprinted with an Ab-C soil profile. The Ab horizon is a 25-cm-thick dark grayish brown silty clay loam. The C horizon is a 44-cm-thick brown silty clay with a few poorly preserved very thin to thin beds of fine to medium quartz sands. The underlying floodplain deposits (85–330+ cm) exhibit a 2Ab-2Bwb-2Bb soil profile. The 2Ab horizon (85–156 cm) is a dark gray silty clay loam. A bulk soil sample collected from the 2Ab horizon at 114–122 cm produced a conventional radiocarbon age of 1070 ± 80 B.P. (Beta-154296).

The 2Bwb horizon (156–306 cm) is a dark grayish brown silty clay, while the 2Bb horizon (306–330+ cm) is a dark grayish brown silty clay loam. The radiocarbon age of the buried soil in Trench 6 and the degree of development observed in all of the buried soils throughout the site suggest that the alluvial deposits composing the terrace are late Holocene in age.

Cultural Feature

Feature 1, a thin lens of oxidized sediment, charcoal, and ash, was discovered in the wall of Trench 3. The feature covers most of Test Units 3 and 4 at a depth of ca. 203–212 cm. The excavated portion measures ca. 2.0x0.75 m (Figure 42). The lens is approximately 7–9 cm thick. It contains concentrations of ash, charcoal, and oxidized sediment; however, none are discrete, isolable layers. The lens exhibits a broad, slightly basin-shaped profile across Test Unit 3, but that shape is not reflected elsewhere in the feature cross section. In general, the cross section is gently undulating, showing no evidence of a prepared surface. No cultural materials were observed during excavation of the feature. Approximately 42.8 liters of sediment were collected from the feature for flotation processing (see Materials Recovered).

While the exact function of Feature 1 is unclear, it is reasonable to think that the feature is an unprepared heating/cooking surface. This is suggested by the presence of charcoal, ash, and oxidized sediment; the lack of burned rocks; and the recovery of charred faunal remains from the fill. The age of the feature is unknown, but a Late Archaic age is inferred based on its provenience and a radiocarbon age on bulk soil collected from Trench 6 in the same soil-stratigraphic zone.

Materials Recovered

A single chipped stone artifact and 31 invertebrate faunal remains were recovered during hand excavations at 41ML194. Materials also were recovered from the flotation of Feature 1 fill.

CHIPPED STONE ARTIFACT

One piece of unmodified lithic debitage was recovered from Test Unit 5, Level 19 (315–325 cm). The specimen is a 5–6-cm chunk of dark gray chert. Most of the specimen is covered with cortex, and it may represent a tested cobble fragment.

INVERTEBRATE FAUNAL REMAINS

Of the 31 pieces of mussel shell recovered from the site, only 3 specimens are identifiable (Table 15) (see Appendix B). The remaining 28 are too eroded or fragmented for identification.

OTHER MATERIALS

Flotation sampling from Feature 1 recovered 11 small (less than 1 cm) unidentified bone fragments and a minute quantity of charcoal. Seven of the bones are burned or calcined.

Chronology and Components

Based on the distribution and depths of cultural materials and a radiocarbon assay, one component is defined for 41ML194. A radiocarbon age of 1070 ± 80 B.P. on a bulk soil sample from Trench 6 suggests that the cultural deposit, which is stratigraphically below the dated soil sample, is Late Archaic in age (assuming, of course, that this assay does not suffer from the kinds of problems that often are associated with dated soil humates). One feature, an unprepared heating/cooking surface, and a small number of cultural materials are associated with this component. The site probably represents a short-term, specialized task site such as a hunting camp, where small game was processed, cooked, and consumed by a small party of hunters.

Summary and Assessment

Site 41ML194 is a Late Archaic site nestled in a bend of the North Bosque River. It appears that much of the site has been lost to erosion. What is left is represented by a handful of cultural materials and a heating/cooking feature on an unprepared surface. Because of the very low density of artifacts and other cultural remains, including datable materials, 41ML194 lacks the capacity to yield important archeological information. The site is considered ineligible for listing in the National Register of Historic Places.

Figure 42. Photograph of Feature 1, Test Units 3 and 4, 41ML194. View is south.

Site 41ML195

Description

Site 41ML195 is a prehistoric site deeply buried in Holocene alluvium on the north bank of the North Bosque River upstream from the upper end of Waco Lake (see Figure 4). The site occupies a Holocene terrace, the surface of which is at an elevation of ca. 470 ft, between the modern channel to the south and an old partially filled channel ca. 200 m to the north. Vegetation consists of a dense oak, pecan, elm, and juniper forest with a thick understory of brush and greenbriers.

Previous Investigations

Site 41ML195 was located and recorded in 1984 (Prikryl and Jackson 1985:246). Investigations were limited to inspection of a 6–7-m-high cutbank, where cultural materials were observed over a distance of ca. 60 m. Scattered mussel shell fragments and one chert flake were noted at 70–80 cm below the surface, and another lens of mussel shells and burned rocks was observed at ca. 3 m. Both lenses were recorded as dipping down to the east. Scattered mussel shell fragments, but no artifacts, were noted between the lenses.

Site 41ML195 was revisited in 1999 as part of a site re-location and reassessment effort (Kvernes et al. 2000:65–66). The cutbank, with the Waco Lake conservation pool at its normal 455-ft level, was approximately 5.5 m high. Visibility generally was good, except for the upper 20 cm where poison oak and weeds partially obscured the bank. Mussel shell fragments were observed in the cutbank around 80 cm below the surface. A second lens of mussel shells approximately 5 cm thick was noted at a depth of 3 m, extending for a distance of about 40 m. Some evidence of erosion was noted, but intact cultural deposits clearly were present. No shovel tests were excavated because of the depth of the cultural deposits.

Table 15. Provenience of mussel shells from 41ML194

Provenience	Quantity	Identification
TEST UNIT 3		
Level 22 (360–370 cm)	8	Unidentified
TEST UNIT 4		
Level 17 (310–320 cm)	1	*Tritogonia verrucosa*
Level 19 (330–340 cm)	1	Unidentified
Level 21 (350–360 cm)	2	Unidentified
TEST UNIT 5		
Level 5 (175–185 cm)	1	Unidentified
Level 17 (295–305 cm)	2	Unidentified
Level 18 (305–315 cm)	1	*Amblema plicata*
Level 19 (315–325 cm)	3	Unidentified
Level 22 (345–355 cm)	2	Unidentified
Level 24 (365–375 cm)	1	Unidentified
TEST UNIT 6		
Level 16 (285–295 cm)	1	Unidentified
Level 17 (295–305 cm)	3	Unidentified
Level 18 (305–315 cm)	1	*Quadrula* sp.
	1	Unidentified
Level 19 (315–325 cm)	3	Unidentified
TOTAL	31	

Work Accomplished

During the 2000–2001 investigations, a long rebar stake was used as the primary datum and was given an arbitrary elevation of 100.00 m. The datum was placed near a large tree a few meters north of the cutbank edge and between Trenches 1 and 2. A U.S. Army Corps of Engineers benchmark is present at the site, a few meters from the cutbank. Part of the notation reads, "COE 1-3-3 1965." Its location was recorded during site mapping and designated as the secondary datum. The primary datum is 15.5 m due west of the Corps benchmark.

Three trenches were excavated (Figure 43). Trench 1, located on the western edge of the site, was aligned at 356° and measured 5.2x2.9x2.6 m. It was just behind the cutbank. The trench yielded mussel shells, burned rocks, and charcoal at 235–240 cm, while debitage and a projectile point were recovered from the backdirt pile. Trench 2, excavated near the cutbank 20 m east of Trench 1, was aligned at 330° and measured 5.0x3.0x2.4 m. Burned rocks and mussel shells were observed at 230–240 cm. Situated ca. 25 m north of the cutbank on the eastern end of the site area, Trench 3 also encountered cultural materials between 230 and 240 cm. Aligned at 80°, the trench measured 5.3x3.1x2.4 m and was ca. 40 m from Trench 1.

Four test units were hand excavated. Test Units 1 and 2 were placed on the western safety bench of Trench 1. Level 1 in each of the units began 75 cm below the modern ground surface. The excavation was terminated at Level 21 (285 cm). Test Units 3 and 4 were placed on the southern safety bench of Trench 3. The first level in these units began 85 cm below modern ground surface and the last was Level 19 (275 cm). A total of 8.0 m^3 were hand excavated.

Site Extent and Depth

As originally recorded in 1984 (Prikryl and Jackson 1985:246), 41ML195 consisted of an 80-m-long exposure of chert flakes, burned rocks, and mussel shells in the terrace cutbank along the North Bosque River. Cultural materials were observed at depths of up to ca. 3 m below the surface. Test excavations in 2000–2001 found that cultural materials extend a substantial distance in from the cutbank, at least 30 m. Based on this and current observations of the materials exposed in the cutbanks, it is estimated that the site covers an area that is roughly 50x30 m.

Although small numbers of mussel shells and shell fragments were encountered throughout the upper deposits during testing, unquestionable cultural materials (lithic debitage) were not encountered until ca. 185 and 205 cm in Test Units 2 and 1, respectively. The frequency of cultural materials substantially decreased between ca. 265 and 275 cm. Although mussel shell fragments were encountered at 285 cm, they were not associated with any obvious cultural materials.

Sediments and Stratigraphy

The sediments and stratigraphy at 41ML195

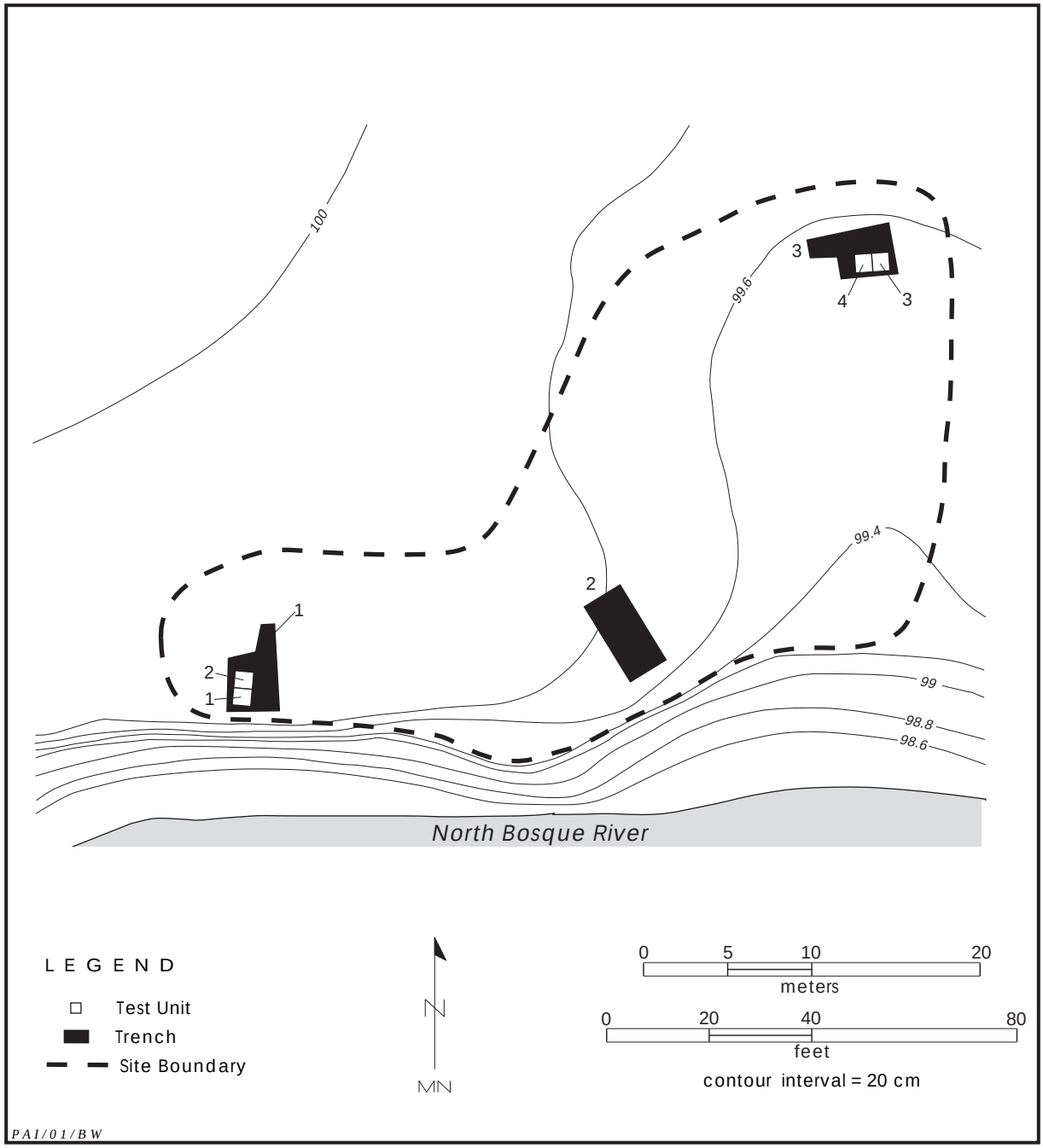

Figure 43. Map of 41ML195.

were examined through the profiles of three trenches and descriptions of the soil stratigraphy of two of the trench profiles (see Appendix A). The site is situated on a Holocene alluvial terrace that stands ca. 6 m above the North Bosque channel. Soils on the terrace surface belong to the Catalpa series (Templin et al. 1958). Catalpa soils are calcareous grayish brown to dark grayish brown clay loam to clayey soils formed on recent alluvium.

The terrace surface is covered by an 18–19-cm-thick veneer of recent grayish brown to

dark grayish brown loamy alluvium (Figure 44). A very thin to thin bed of medium to coarse sand-sized quartz and carbonate clasts is present at the base of this deposit. The recent alluvium overlies late Holocene alluvium that is imprinted with multiple soils. Trench 1 expresses an Ab-Bwb-Bwb2-2Ab soil profile, and Trench 3 displays an Ab-Bwb-2Ab soil profile. The upper buried soil (Ab-Bwb and Ab-Bwb-Bwb2) in both profiles is imprinted on upward-fining channel fill deposits. In Trench 1, the Ab horizon (18–46 cm) consists of very dark grayish brown sandy clay loam with a discontinuous thin bed of coarse sand-sized quartz, carbonate clasts, and fossilized shell fragments. The underlying Bwb horizon (46–96 cm) is a dark grayish brown very fine sandy clay loam, and the Bwb2 horizon (96–200 cm) is a very dark grayish brown fine to medium sandy loam. In Trench 3, the Ab horizon (19–36 cm) consists of a very dark grayish brown silty clay loam, while the underlying Bwb horizon (36–190 cm) is a dark grayish brown coarse to very coarse sandy clay loam with 2 percent limestone gravels.

The previously described channel fill deposits overlie a second buried soil that is imprinted on dark loamy alluvium (overbank sediments). The 2Ab horizon of Trench 1 (200–250+ cm) consists of a dark grayish brown silty clay loam, while the 2Ab horizon of Trench 3 (190–242+ cm) is a dark grayish brown clay loam. The soil contains a rich assemblage of cultural materials.

Cultural Feature

One discrete cluster of burned rocks was discovered and designated Feature 1 (Figure 45). Feature 1 is located in Test Unit 1, Level 19 (255–261 cm), and measures ca. 50x50 cm. It is a single layer of mostly flat-lying tabular burned rocks, averaging about 15–20 cm in size and weighing 5.5 kg. In cross section, the feature measures about 6 cm in thickness and has a slight basin-shaped base, which is accentuated by the tilting of the burned rocks toward the center of the feature. Some of the rocks, particularly the bases or bottoms, are fire reddened or oxidized. No ash or oxidized sediment was observed, however, a charcoal sample was collected from below one of the rocks. Laboratory analysis found that this sample is a mix of a small amount of charred wood and organic sediment. The sample produced a radiocarbon age of 3130 ± 40 B.P. (Beta-154287). Two other charcoal samples (one of which was identified as oak wood) were collected from just outside the feature in Test Unit 2. These two samples yielded radiocarbon ages of 2740 ± 40 B.P. (Beta-154290) and 2870 ± 40 B.P. (Beta-154288). It is believed that these two radiocarbon ages are a better estimate of the age of Feature 1 than the radiocarbon age of 3130 ± 40 B.P. from the feature itself because they are on charcoal rather than a mix of charcoal and organic sediment.

No artifacts were observed during excavation of the feature; however, mussel shells were found in association with the burned rocks, and three dart points were found in Level 18 of the adjacent test unit (see Materials Recovered). Approximately 13.5 liters of feature fill were collected for flotation. Flotation processing recovered 0.036 kg of small burned rocks, 19 pieces of lithic debitage, 9 bone fragments, some charred botanical remains, and 8 mussel shell fragments. The faunal remains were included in the vertebrate faunal analyses (see Materials Recovered).

Feature 1 represents a small hearth or baking pit as suggested by its basin shape. It is probable that the ground surface was prepared by digging a shallow pit and lining it with a single layer of tabular rocks so that heat could be stored and cooking time increased.

Materials Recovered

Modest amounts of cultural materials were recovered from 41ML195: 141 chipped stone artifacts, 760 invertebrate faunal remains, 14 vertebrate faunal remains, and some burned rocks. Provenience data are presented in Table 16.

CHIPPED STONE ARTIFACTS

The 141 chipped stone artifacts consist of 4 dart points, 2 bifaces, 14 pieces of edge-modified debitage, and 121 pieces of unmodified debitage.

Dart Points

Carrollton

One specimen is classified as a Carrollton dart point (Turner and Hester 1993:85) (Figure 46a). The triangular blade is broad, and

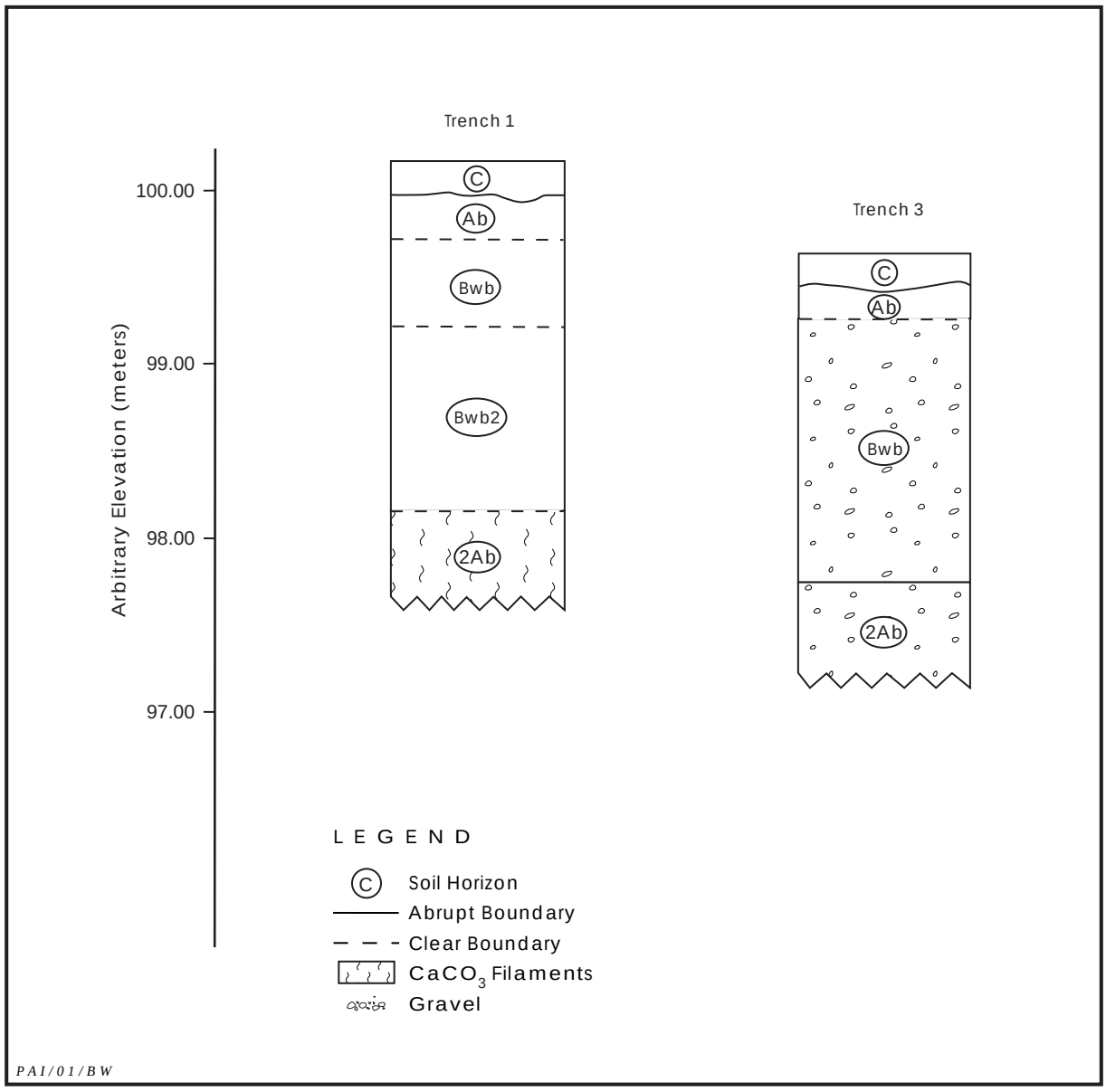

Figure 44. Profiles of Trenches 1 and 3, 41ML195.

the shoulders are prominent with moderate barbs. The stem is slightly contracting, and its base is straight. The raw material is a light grayish brown chert with some pinkish hues along the basal edge. Provenience and metric data for this and the other dart points recovered are provided in Table 17.

Ellis

Two specimens are identified as Ellis points (Turner and Hester 1993:113) (Figure 46b–c). The first is nearly complete and has a small triangular blade with serrated edges. The shoulders are prominent and barbed. The stem is expanding, and the base is convex. Basal grinding is evident, which is unusual for Ellis points (Elton Prewitt, personal communication 2001). The material is a black chert with lighter gray inclusions and small crystalline vugs. The second specimen is a nearly intact point, missing the tip, one lateral blade edge, and a barb. The

Figure 45. Photograph of Feature 1, 41ML195.

blade is small and triangular with moderate barbed shoulders. The stem is short and expanding, and the base is convex. The material is a light gray chert with lighter gray mottles.

Untyped

One specimen could not be typed (Figure 46d). It is a distal fragment. The intact portion of the blade displays alternate left beveling. The material is a gray chert with white speckles.

Bifaces

Two bifaces were recovered, an intact adze (Figure 46e) and a proximal bifacial fragment. Collected from Test Unit 1, Level 18 (245–255 cm), the adze is in an early stage of reduction; it measures 64.4 mm long by 53.4 mm wide by and 20.2 mm thick. The raw material is a light to dark brown chert with gray mottling; cortex is present on the dorsal side of the tool.

The proximal fragment is from Test Unit 2, Level 18 (245–255 cm), and is in the middle stage of reduction and likely a manufacturing failure. The only measurable attribute is its thickness, which is 8.7 mm. The material is a light gray chert with fine white speckled inclusions.

Edge-modified Debitage

Fourteen pieces of edge-modified debitage were identified. Fifty percent (n = 7) are complete flakes, 21 percent (n = 3) are proximal fragments, and 29 percent (n = 4) are chips. Over half of the specimens (57 percent, n = 8) have dorsal cortex. The majority of the utilized flakes have one working edge (n = 8), and 4 specimens have two working edges. The remaining 2 pieces display three working edges. None of the specimens are smaller than 2 cm in size, and the largest piece is 4–5 cm. The two edge-modified flakes with three working edges are 2–3 cm in size. Overall, 50 percent (n = 7) of the assemblage are 2–3 cm in size and 43 percent (n = 6) are 3–4 cm. The remaining specimens (7 percent) are 4–5 cm. Raw material colors range from gray to light gray and brown cherts.

Table 16. Summary of cultural materials from 41ML195

Provenience	Bifaces	Dart Points	Edge-modified Debitage	Unmodified Debitage	Unmodified Bones	Unmodified Mussel Shells	Totals
TRENCH 1 (backdirt)	–	1	–	–	–	–	1
TEST UNIT 1							
Level 2 (85–95 cm)	–	–	–	–	–	1	1
Level 5 (115–125 cm)	–	–	–	–	–	1	1
Level 6 (125–135 cm)	–	–	–	–	–	1	1
Level 8 (145–155 cm)	–	–	–	–	–	1	1
Level 11 (175–185 cm)	–	–	–	–	–	2	2
Level 12 (185–195 cm)	–	–	–	–	–	3	3
Level 14 (205–215 cm)	–	–	1	1	–	3	5
Level 15 (215–225 cm)	–	–	–	2	–	9	11
Level 16 (225–235 cm)	–	–	–	–	–	8	8
Level 17 (235–245 cm)	–	–	–	5	–	10	15
Level 18 (245–255 cm)	1	–	–	15	–	113	129
Feature 1 (255–261 cm)	–	–	–	19	9	8	36
Level 19 (255–265 cm)	–	–	1	26	1	66	94
Level 20 (265–275 cm)	–	–	–	–	–	69	69
Level 21 (275–285 cm)	–	–	–	–	–	11	11
Subtotals	1	0	2	68	10	306	387
TEST UNIT 2							
Level 8 (145–155 cm)	–	–	–	–	–	1	1
Level 11 (175–185 cm)	–	–	–	–	–	3	3
Level 12 (185–195 cm)	–	–	1	–	–	2	3
Level 13 (195–205 cm)	–	–	–	1	–	1	2
Level 14 (205–215 cm)	–	–	–	–	–	2	2
Level 15 (215–225 cm)	–	–	–	1	–	60	61
Level 16 (225–235 cm)	–	–	–	1	–	3	4
Level 17 (235–245 cm)	–	–	–	4	–	22	26
Level 18 (245–255 cm)	1	3	5	32	4	158	203
Level 19 (255–265 cm)	–	–	4	14	–	13	31
Level 20 (265–275 cm)	–	–	–	–	–	26	26
Level 21 (275–285 cm)	–	–	–	–	–	4	4
Subtotals	1	3	10	53	4	295	366
TEST UNIT 3							
Level 5 (125–135 cm)	–	–	–	–	–	4	4
Level 6 (135–145 cm)	–	–	–	–	–	1	1
Level 9 (165–175 cm)	–	–	–	–	–	5	5
Level 10 (175–185 cm)	–	–	–	–	–	2	2
Level 11 (185–195 cm)	–	–	–	–	–	3	3
Level 12 (195–205 cm)	–	–	–	–	–	1	1
Level 13 (205–215 cm)	–	–	–	–	–	4	4
Level 14 (215–225 cm)	–	–	–	–	–	3	3
Level 15 (225–235 cm)	–	–	2	–	–	10	12
Level 16 (235–245 cm)	–	–	–	–	–	16	16
Level 17 (245–255 cm)	–	–	–	–	–	7	7
Level 18 (255–265 cm)	–	–	–	–	–	27	27
Level 19 (265–275 cm)	–	–	–	–	–	5	5
Subtotals	0	0	2	0	0	88	90

Table 16, continued

Provenience	Bifaces	Dart Points	Edge-modified Debitage	Unmodified Debitage	Unmodified Bones	Unmodified Mussel Shells	Totals
TEST UNIT 4							
Level 1 (85–95 cm)	–	–	–	–	–	1	1
Level 4 (115–125 cm)	–	–	–	–	–	1	1
Level 6 (135–145 cm)	–	–	–	–	–	1	1
Level 7 (145–155 cm)	–	–	–	–	–	1	1
Level 8 (155–165 cm)	–	–	–	–	–	1	1
Level 9 (165–175 cm)	–	–	–	–	–	3	3
Level 10 (175–185 cm)	–	–	–	–	–	3	3
Level 11 (185–195 cm)	–	–	–	–	–	3	3
Level 12 (195–205 cm)	–	–	–	–	–	1	1
Level 13 (205–215 cm)	–	–	–	–	–	5	5
Level 14 (215–225 cm)	–	–	–	–	–	8	8
Level 15 (225–235 cm)	–	–	–	–	–	14	14
Level 16 (235–245 cm)	–	–	–	–	–	11	11
Level 17 (245–255 cm)	–	–	–	–	–	6	6
Level 18 (255–265 cm)	–	–	–	–	–	12	12
Subtotals	0	0	0	0	0	71	71
TOTALS	2	4	14	121	14	760	915

Unmodified Debitage

A total of 121 pieces of unmodified debitage were recovered. Of those flakes, 31 percent (n = 38) are complete, 34 percent (n = 41) are proximal fragments, 28 percent (n = 34) are chips, and 7 percent (n = 8) are chunks. Cortex is absent on 49 percent (n = 60). Only 6 flakes have 100 percent of their dorsal surfaces covered with cortex. The unmodified debitage ranges from less than 1 cm to 5 cm in size. A maximum size of 1–2 cm is represented by 36 percent (n = 44) of the debitage. The most frequent size range is 2–3 cm as represented by 38 percent (n = 46) of the debitage. Fourteen percent (n = 17) are less than 1 cm, the majority of which are from Feature 1. Finally, 12 percent (n = 14) are 3–5 cm. Raw material colors vary from a light gray to a dark gray chert (the more common color) to variations of brown or tan. An almost black chert was noted. A few flakes exhibit a pinkish hue from thermal alteration.

INVERTEBRATE FAUNAL REMAINS

Of the 760 mussel shells collected, 409 are complete enough for taxonomic identification (see Appendix B). The identified taxa consist of *Amblema plicata*, *Cyrtonaias tampicoensis*, *Cyrtonaias* sp., *Leptodea fragilis*, *Leptodea* sp., *Potamilus purpuratus*, *Potamilus* sp., *Quadrula apiculata*, *Quadrula petrina*, *Quadrula* sp., and *Tritogonia verrucosa* (one fossilized oyster [Cretaceous] was identified as well). The most common species identified is *Amblema plicata*, also known as threeridge mussel (n = 274, or 67 percent).

VERTEBRATE FAUNAL REMAINS

Fourteen animal bones were recovered, including those from the flotation samples (see Appendix C). The specimens are too incomplete to be identified to the species, genus, or family level. Eleven specimens are identified simply as Vertebrata, while the remaining three are identified as medium-sized to large mammalian elements. Five specimens are charred. The assemblage is too small and incomplete to draw any clear conclusions about subsistence practices, other than the fact that the medium-sized to large mammalian elements may represent deer.

OTHER MATERIALS

Besides the burned rocks from Feature 1,

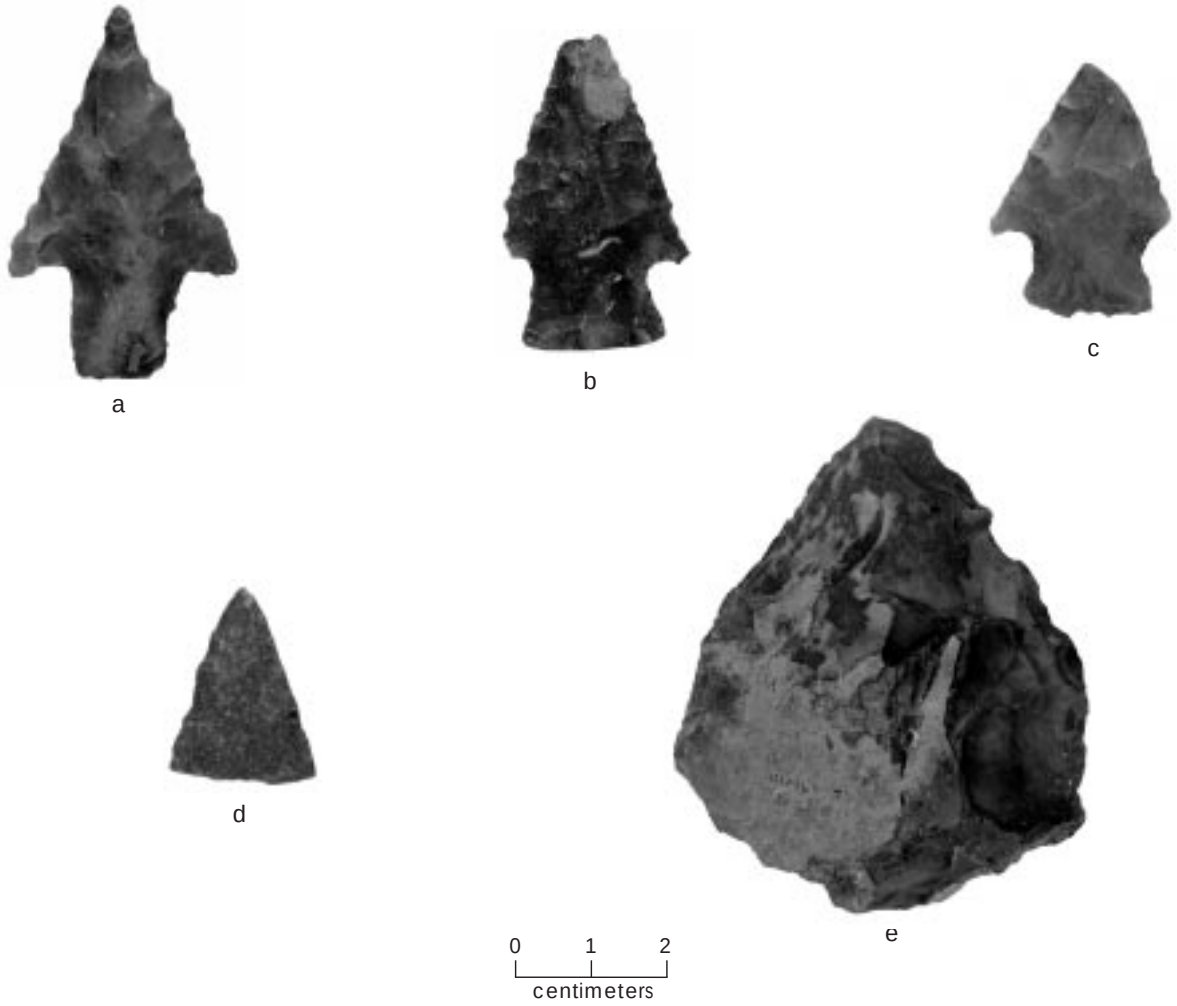

Figure 46. Dart points and a biface from 41ML195. (a) Carrollton; (b–c) Ellis; (d) untyped; (e) adze.

fewer than 30 other burned rocks weighing under 10 kg total were observed during testing. Test Units 1 and 2 yielded about 15 (6 kg) nonfeature burned rocks, while Test Units 3 and 4 yielded about 11 (3 kg).

Chronology and Components

Radiocarbon ages, soil stratigraphy, and the distribution of the cultural materials allow for the delineation of a single component. Although a small number of artifacts were recovered from the upper deposits (ca. 0–200 cm), their age and associations remain unclear. The vast majority of the artifacts and other cultural materials were recovered from a ca. 30–40-cm-thick zone within the buried soil or 2Ab horizon (Levels 17–20 of Test Units 1 and 2, and Levels 15–18 of Test Units 3 and 4).

Three diagnostic artifacts are associated with this component, but they do not provide much clarity in regards to the age of the component. The artifacts are darts typed as Carrollton and Ellis points. The Carrollton point was found on the backdirt pile of Trench 1 with numerous mussel shells shortly after they came out of the backhoe bucket. The mussel shells were part of a discrete zone of shells associated with the buried cultural deposit. Although the dart point was found out of context, there is little doubt that it is associated with the buried component. Carrollton points are assigned to the Middle Archaic period (6000–3500 B.P.) in north-central Texas (see Prikryl 1990). A fairly un-

Table 17. Provenience and metric data for dart points from 41ML195

Provenience	Point Type	Tool Completeness	Maximum Length	Maximum Blade Width	Haft Length	Neck Width	Base Width	Maximum Thickness
TRENCH 1 (backdirt)								
	Carrollton	intact/nearly complete	48.5	29.7	12.2	14.1	11.6	8.9
TEST UNIT 2								
Level 18 (245–255 cm)	Ellis	intact/nearly complete	41.2	23.3	8.3	14.7	18.6	7.0
Level 18 (245–255 cm)	Ellis	intact/nearly complete	–	–	8.1	14.0	16.9	7.0
Level 18 (245–255 cm)	Untyped	distal	–	–	–	–	–	4.7

Note: All measurements are in millimeters.

common point style, few Carrollton points are known from excavated contexts or associated with radiocarbon ages. Site 41FT226, along the Trinity River in Freestone County, yielded a Carrollton point with an associated radiocarbon age of 3786 ± 56 B.P. (Richner and Bagot 1978:232). Ellis points are common in north-central Texas and are assigned to the Late Archaic period (3500–1250 B.P.) (see Prikryl 1990). At 41CO141 along the Elm Fork of the Trinity, an Ellis-like point was associated with a raw radiocarbon age of 1810 ± 90 B.P. (Prikryl and Yates 1987:83). As previously noted, the presence of these two projectile point types does not provide much clarity in terms of the age of the component, given that the two styles are not well dated.

Four radiocarbon ages associated with the component provide a less nebulous picture and suggest the cultural materials represent a single occupation. Three of the radiocarbon ages are on charcoal and produced two-sigma calibrated date ranges that overlap significantly (see Appendix D). Two of these (2740 ± 40 and 2870 ± 40 B.P.) are believed to be associated with Feature 1 (see Cultural Features), while the third (2790 ± 40 B.P., Beta-154289) is on scattered elm wood charcoal collected from Test Unit 4, Level 19. The fourth radiocarbon age, which is on a mix of charcoal and organic sediment from Feature 1, is slightly older, at 3130 ± 40 B.P. Based on the first three radiocarbon assays, the age of the buried component is estimated to be ca. 2800–3000 B.P.

Component artifacts and other materials consist of 4 dart points, 2 bifaces (including an adze), 12 pieces of edge-modified debitage, 115 pieces of unmodified debitage, 588 mussel shells, and 14 pieces of bone. The debitage assemblage indicates that the reduction of cortical materials (chert cobbles) took place at the site, probably for the production of bifacial tools. Flake byproducts were used to complete expedient tasks. Along with the small burned rock feature (Feature 1), the formal and expedient tools suggest that hunting, game processing, and woodworking took place. The small vertebrate faunal assemblage includes three medium-sized to large mammalian elements (the other 11 specimens are identified as Vertebrata) and suggests that deer may have been consumed at the site. Aside from possibly deer, mussels also appear to have been part of the diet. The species *Amblema plicata* (threeridge mussel) dominates the assemblage.

Summary and Assessment

Site 41Ml195 contains a discrete, buried cultural zone that is ca. 30–40 cm thick. A tight series of radiocarbon ages indicates that the cultural zone may represent a single occupation dating to ca. 2800–3000 B.P. Although cultural materials are dispersed vertically over 30–40 cm (probably through bioturbation), the cultural zone has been buried and sealed by ca. 200 cm of alluvium, preserving and protecting its contextual integrity. The contextual integrity, the discreteness of the cultural zone, and the preservation of organic remains, in conjunction with the chronological data, indicate that

the site has the capacity to yield important information. The prehistoric inhabitants of the site utilized the locality as a base camp judging from the variety of activities and tasks indicated, including the consumption of mussels and possibly deer and the production of chipped stone tools. The site appears to have the ability to yield a more-detailed picture of these activities. A more-specific issue that can be addressed is subsistence and diet of the inhabitants based on the recovery of faunal remains and other organic materials, which in addition may serve as an indicator of environmental change. The recovery of a discrete tool assemblage from a well-dated context may allow identification of diagnostic assemblage characteristics. The same can be said for features at the site, in terms of their function, morphology, and composition. The temporal placement and range of Carrollton and Ellis dart points also can be addressed. On a larger scale, the site may contribute useful information for comparisons between archeological manifestations in central Texas and north-central Texas. Overall, the site offers a rare opportunity to examine a discrete interval of time, possibly a single occupation, and its associated cultural materials. For this reason, it is recommended that 41ML195 be considered eligible for listing in the National Register of Historic Places.

ASSESSMENTS AND RECOMMENDATIONS

5

NATIONAL REGISTER ASSESSMENTS

National Register of Historic Places testing was completed at seven prehistoric sites and two historic sites at Waco Lake in McLennan County, Texas, in 2000–2001. The project was prompted by plans to raise the level of the lake by 7 ft, with the testing undertaken to identify important sites that might need data recovery excavations before they are impacted by rising lake waters. As explained below, three of the prehistoric sites (41ML135, 41ML186, and 41ML194) and the two historic sites (41ML140 and 41ML179) are considered ineligible for listing in the National Register, while four prehistoric sites (41ML160, 41ML162, 41ML185, and 41ML195) are considered eligible for listing.

A site's significance is evaluated based on the criteria identified by the National Park Service (1995:2). Cultural resources are eligible for listing in the National Register of Historic Places, and thus worthy of avoidance, protection, or mitigation through data recovery, if they are significant in American history, architecture, engineering, or culture (National Park Service 1995:2). Significant properties are those that possess integrity of location, design, setting, materials, workmanship, feeling, and association and:

A. are associated with events that have made a significant contribution to the broad patterns of our history; or

B. are associated with the lives of persons significant in our past; or

C. embody the distinctive characteristics of a type, period, or method of construction, or that represent the works of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. have yielded or may likely yield information important in prehistory or history [National Park Service 1995:2].

Criterion D as defined above readily applies to both prehistoric and historic archeological sites. It is against this criterion that the sites tested in 2000–2001 are evaluated.

Neither of the tested historic sites appears to be eligible for National Register listing. Site 41ML140, the location of the housesite occupied by George Erath (1850–1868) and Duncan McLennan (1868–1930), and perhaps subsequently by tenants of Nannie Sinclair, has at least eight cultural features and numerous artifacts associated with this occupation span. However, only part of one investigated feature (a trash disposal area) yielded intact, archeologically important, mid-nineteenth-century deposits of artifacts and faunal remains. Approximately two-thirds of this feature was excavated during testing, leaving little potential for it to yield additional information. Elsewhere on the site, the cultural materials representing the various occupations are mixed together, offering little opportunity to isolate early assemblages that could contribute important information. The features provide limited

information on the general layout of the immediate house area, and 41ML140 represents only the core habitation; the larger plantation/farming complex of which the residence was a part remains unidentified archeologically. Hence, 41ML140 has little capacity to contribute important information concerning the use of space and activity areas. The sparseness of contexts containing isolable early assemblages and the inability to address issues related to overall plantation/farmstead layout render the site ineligible for National Register listing.

Site 41ML179 is the 1866–1877 Nicholas and Jennett Sneed housesite. It consists of a single identified feature representing a collapsed chimney and an associated artifact scatter. While the artifact assemblage represents a limited span of time consistent with the archivally determined dates for the Sneed occupation, it has little capacity to contribute important information because it exhibits few attributes that would aid in site interpretation. For example, most of the table ceramic sherds are either undecorated or burned, much of the glass is melted beyond identification, and the largest single artifact class—cut nails—has little interpretive value beyond the obvious. Further, the single known feature was sufficiently excavated during testing, leaving little potential for it to yield additional information, and the lack of information on other features at the site limits inquiry into questions about farmstead layout, the use of space, and activity areas. These characteristics indicate that 41ML179 is ineligible for National Register listing.

Prehistoric sites 41ML135, 41ML186, and 41ML194 are judged to be ineligible for National Register listing because they yielded so few artifacts (only 60 chipped stone artifacts for all three sites combined) and other cultural materials that they lack the capacity to yield any important information about prehistory. Few interpretations can be made, and only limited insights on chronology and site activities can be gained from the small assemblages. In some cases, the small numbers of artifacts were recovered from disturbed contexts, further limiting interpretations.

Prehistoric sites 41ML160, 41ML162, 41ML185, and 41ML195 are considered eligible for listing in the National Register of Historic Places because they contain cultural deposits with the following characteristics: good contextual integrity; stratigraphically isolable components; and sufficient quantities of artifacts and other materials for interpretation. These four sites date from the latter part of the Middle Archaic period (ca. 5000 B.P.) to the Late Prehistoric period. At 41ML160, cultural materials are deeply buried and part of a single discrete component. Though undated, the artifacts, feature, and other materials indicate the site was occupied briefly, probably as a hunting camp. Multiple dated components characterize 41ML162. The components are discrete and rich in artifacts, indicating use of the locale as a habitation site from the latter part of the Middle Archaic period through the Toyah phase of the Late Prehistoric period. Artifacts and other materials recovered from 41ML185 indicate that it also was used as a habitation site. While the contextual integrity of the Late Archaic-Late Prehistoric component is somewhat compromised, a more-discrete, less-disturbed late Middle Archaic to early Late Archaic component is present in the deeper deposits. A single dated, discrete early Late Archaic component characterizes 41ML195. Artifacts and other materials are deeply buried and suggest the locale was utilized as a habitation site. In short, these sites have the potential to contribute high-resolution data sets that can be used to address a variety of important research issues, resulting in a reliable reconstruction of hunter and gatherer lifeways and adaptive strategies for the Waco Lake area during the late Holocene.

DATA RECOVERY RECOMMENDATIONS AND GENERAL RESEARCH ISSUES AT WACO LAKE

Two of the four prehistoric sites recommended as being eligible for National Register listing—41ML162 and 41ML195—are especially good candidates for data recovery excavations. While judged to be eligible based on the contextual integrity and discreteness of their cultural deposits, 41ML160 and 41ML185 are not as suited for data recovery excavations because they are not as well-dated as the components at 41ML162 and 41ML195 (i.e., questions remain about their chronologies) and their cultural deposits are not as rich or dense. Further, these sites appear not to represent time peri-

ods or activities that are poorly represented at 41ML162 and 41ML195, and all four sites are located fairly close to one another along a 5.6-km stretch of the North Bosque River. In short, 41ML160 and 41ML185 are likely to be less productive than 41ML162 and 41ML195 and to yield information that is largely redundant.

Along with 41ML162 and 41ML195, it also is recommended that data recovery excavations be conducted at 41ML35 (Baylor site) and 41ML37 (Britton site). Moderately extensive test excavations were conducted at the Baylor and Britton sites in the 1960s (Story and Shafer 1965), and they are considered eligible for listing in the National Register of Historic Places (see Kvernes et al. 2000:70). These four sites have the ability to address issues of how prehistoric hunters and gatherers utilized the riparian zone along the North Bosque River throughout the late Holocene. On a site by site basis, the data recovery excavations should focus on what types of activities took place, what resources were utilized, and, if possible, during what seasons the sites were occupied. Collectively, the sites may address how the riparian zone of the North Bosque River was utilized within the larger context of the Grand Prairie landscape. Was the North Bosque river valley utilized strictly as a base for foraging activities within and outside the riparian zone? Was it utilized as a corridor for movement between the Grand Prairie and the Blackland Prairie to the east? Information gained from data recovery excavations and analyses should be compared to data from sites in similar riparian environments, such as the Leon River at Fort Hood (see Mehalchick et al. 1999), to address these and similar questions.

The four sites also have the ability to address interregional contacts and movement of groups through the comparison of artifact assemblages and distributions of specific artifact types. The sites at Waco Lake are located along the northern periphery of what traditionally is considered the central Texas archeological region (e.g., Prewitt 1981; Suhm 1960). The archeological record of this area (Waco Lake) contains elements that suggest influences and contacts to varying degrees over time with areas to the north and east. Comparisons of artifact assemblages, particularly projectile points, recovered from the four Waco Lake sites to those from central Texas sites should provide some insights into the movement of groups from surrounding regions into central Texas. In addition, some of the more poorly dated projectile point styles, such as Carrollton and Ellis, can be placed more securely in time.

These research questions and others can be addressed through extensive block excavations at all four sites. At 41ML162, block excavations should focus on the western half of the site, where cultural materials were recovered from discrete, well-dated components. At the Higginbotham site (41ML195), the upper ca. 200 cm should be removed mechanically before data recovery excavations are undertaken in the vicinity of Trenches 1 and/or 3. For the Baylor and Britton sites, the collections and records at the Texas Archeological Research Laboratory should be reviewed prior to developing specific data recovery plans, e.g., to determine what kinds of information are needed to make more-complete interpretations, to determine the sizes and locations of the block excavations, etc.

Age estimates for all excavated components should be determined through radiocarbon dating of organic materials (preferably charcoal) from secure contexts, such as features. This will provide a chronological framework for the placement of artifacts and assemblages into interpretable contexts. Site activities can be interpreted through the artifact and feature assemblages recovered. Multicomponent sites, such as 41ML162, Baylor, and Britton, provide the added dimension of depicting how these assemblages, and hence site activities, varied or stayed static over time. Analyses of the chipped stone tools and debitage recovered can provide insights into the acquisition and reduction of lithic raw materials and the onsite tasks completed with lithic tools. Diversity in tool assemblages will offer indications of site activities, as well as clues about the duration of occupations.

Burned rock features also can provide information on the intensity of site use through evidence of recycling and reheating of feature rocks. Size grading of burned rocks, careful observations and documentation of feature constituents, and archeomagnetic data from feature rocks can provide clues about feature reuse and rock recycling. Analyses of faunal and charred botanical remains and residues on tools and burned rocks will provide information on what resources were utilized at the sites, what sub-

sistence strategies were employed by the sites' occupants, and possibly during what season(s) the sites were occupied. These data also may serve as proxy indicators for determining past environmental conditions and, along with sedimentological and isotopic data from soils, bones, etc., provide a better understanding of environmental constraints and resource availability. Geomorphological investigations should be conducted at the sites, as well as at other localities along the lower portion of the North Bosque River valley, to provide information on site formation processes and, on a larger scale, provide a picture of past environments and resource availability. It is recommended that these investigations involve personnel in the Department of Geology at Baylor University because of their extensive knowledge of the Quaternary geology of the Brazos River basin.

In addition, Waco Lake is an area where professional and avocational archeological investigations have taken place over several decades, involving work by some of Texas's most prominent archeologists. Many of these individuals retain an active research interest in the central Texas region, and they may be able to provide important insights into the role these earlier investigations had in the development of central Texas archeology and where research should be directed today. It is recommended that the Corps of Engineers sponsor a one-day meeting while the data recovery excavations are ongoing (e.g., during work at 41ML162 and/or 41ML195 but before work commences at the Baylor and Britton sites) to explore these issues.

Lastly, such a publicly funded project so close to a large urban area offers many opportunities to share the story of archeology and prehistoric lifeways with a large segment of the public. It is recommended that the Corps of Engineers support and sponsor such measures, which could include the production of a popular report for local distribution, the development of an interpretive display or exhibit, the preparation of an archeology-based curriculum for use in local schools, and/or the sponsorship of public tours or digs. Such activities likely could be coordinated with and carried out partly by local entities or organizations such as the Central Texas Archeological Society or the Strecker Museum at Baylor University.

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APPENDIX A: SOIL-STRATIGRAPHIC DESCRIPTIONS

Karl W. Kibler

Each soil-stratigraphic description is based on a 50–100-cm-wide exposure within the trench or test unit wall. Soil-stratigraphic descriptions use the neutral term "zone" to describe pedogenic and stratigraphic variations within the profile under a single term. Zones are numbered sequentially from the top (surface) down. For each zone the depth, thickness, color, consistence, texture, soil structure, mottles, inclusions (e.g., gravel content), and the nature of the lower boundary are described according to the procedures and criteria presented by Buol et al. (1980:21–43) and the Soil Survey Staff (1996).

The color (Munsell Soil Color Chart) and consistence (loose, very friable, friable, firm, very firm, and extremely firm) of a zone or sediment were recorded from a moist condition. Textural classifications are based on field estimates (see Olson 1976:19) of the relative proportions of particle sizes less than 2.0 mm in diameter (i.e., sand, silt, and clay). Twelve textural classes based on the USDA textural classification of soils (Soil Survey Staff 1996:631) are used: sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The textural name is prefaced by the term gravelly if 20–50 percent of the sediment by volume is of gravel size (2–76 mm), or very gravelly if 50–90 percent of the sediment is of gravel size. In some instances textural classes based on the percentages of gravels and the ratio of sand to mud (silt and clay) (see Folk 1974) are more appropriate to describe the textural properties of zones. This classification scheme has 15 textural classes: gravel, muddy gravel, muddy sandy gravel, sandy gravel, gravelly mud, gravelly muddy sand, gravelly sand, slightly gravelly mud, slightly gravelly sandy mud, slightly gravelly muddy sand, slightly gravelly sand, mud, sandy mud, muddy sand, and sand.

Soil structure characteristics include grade, size, and type. The grade is shown as weak, moderate, or strong. The size of the peds is shown as fine, medium, or coarse, depending on ped morphology or type. The type, referring to the shape of the peds, is identified as blocky (subangular and angular), platy, prismatic, columnar, or granular. Soil horizons not containing these characteristics are considered structureless. If preserved, sedimentary structures are noted and described.

Mottles are described by color, abundance, contrast, and size. Abundance is shown as few (<2 percent), common (2–20 percent), and many (>20 percent), while contrast is described as faint, distinct, or prominent. Size ranges are given as fine (<0.5 cm), medium (0.5–1.5 cm), or coarse (>1.5 cm). The lower boundary of each zone is described in terms of distinctiveness—very abrupt (<0.1 cm), abrupt (0.1–2.5 cm), clear (2.5–6.4 cm), gradual (6.4–12.7 cm), and diffuse (>12.7 cm)—and topography—smooth, wavy, irregular, and broken. Final soil horizon designations are based on the guidelines and criteria of Birkeland (1984) and the Soil Survey Staff (1996).

Site 41ML135

Trench 1

Zone 1	0–29 cm	Dark grayish brown (10YR 4/2) clay loam, very firm, moderate medium subangular blocky structure, 1% limestone gravels (matrix-supported, subrounded to rounded, granule- to pebble-sized), clear smooth boundary. A horizon, late Holocene alluvium.
Zone 2	29–81+ cm	Light olive brown (2.5Y 5/3) silty clay loam, firm, moderate medium angular blocky structure, few krotovinas, 2% limestone gravels (matrix-supported, subangular to subrounded, granule- to pebble-sized), boundary not observed. Bw horizon, late Holocene alluvium.

Trench 4

Zone 1	0–36 cm	Very dark gray (10YR 3/1) clay loam, firm, moderate medium subangular blocky structure, 1% limestone gravels (matrix-supported, subrounded, granule- to pebble-sized), abrupt smooth boundary. A horizon, late Holocene alluvium.
Zone 2	36–103+ cm	Dark grayish brown (10YR 4/2) silty clay loam, firm, weak medium prismatic breaking to moderate fine angular blocky structure, 10% limestone gravels (matrix-supported, subangular to subrounded, granule- to pebble-sized), boundary not observed. Bw horizon, late Holocene alluvium.

Site 41ML160

Trench 1

Zone 1	0–11 cm	Dark grayish brown (10YR 4/2) fine sandy clay loam, firm, moderate fine subangular blocky structure, clear smooth boundary. AC horizon, late Holocene alluvium.
Zone 2	11–54 cm	Very dark gray (10YR 3/1) and very dark grayish brown (10YR 3/2) silty clay loam, firm, moderate medium subangular blocky structure, 2% limestone gravels (dispersed stringer at 35 cm, rounded, granule-sized), gradual smooth boundary. Ab horizon, late Holocene alluvium.
Zone 3	54–219 cm	Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate medium subangular blocky structure, few $CaCO_3$ filaments, clear smooth boundary. Bwb horizon, late Holocene alluvium.
Zone 4	219–329+ cm	Brown (10YR 5/3) silt loam, friable, weak medium prismatic breaking to moderate medium angular blocky structure, common $CaCO_3$ filaments, boundary not observed. Bkb horizon, late Holocene alluvium.

Trench 3

Zone 1	0–27 cm	Alternating horizontal beds and laminae of pale brown (10YR 6/3) sand and dark gray (10YR 4/1) mud, abrupt smooth boundary. C horizon, recent alluvium.
Zone 2	27–50 cm	Grayish brown (10YR 5/2) fine sandy clay loam, firm, weak fine subangular blocky structure, few poorly preserved beds and laminae of sand and mud, heavily bioturbated (microfaunal burrowing), clear smooth boundary. AC

horizon, late Holocene alluvium.

Zone 3	50–86 cm	Very dark grayish brown (10YR 3/2) silty clay loam, firm, moderate medium subangular blocky structure, gradual smooth boundary. Ab horizon, late Holocene alluvium.
Zone 4	86–406 cm	Brown (10YR 5/3) silt loam, firm, moderate medium prismatic structure, few $CaCO_3$ filaments, thin bed of gravel, very coarse and coarse sand at 286 cm, very abrupt smooth boundary. Bwb horizon, late Holocene alluvium.
Zone 5	406–420+ cm	Brown (7.5YR 4/4) clay loam, firm, moderate medium angular blocky structure, common prominent coarse (7.5YR 6/6) mottles, boundary not observed. 2Bb horizon, early(?) Holocene alluvium.

Trench 5

Zone 1	0–32 cm	Alternating beds and laminae of pale brown (10YR 6/3) fine to medium sand and grayish brown (10YR 5/2) mud, abrupt smooth boundary. C horizon, recent alluvium.
Zone 2	32–68 cm	Dark grayish brown (10YR 4/2) silty clay loam to fine sandy clay loam, friable, weak fine subangular blocky structure, clear smooth boundary. AC horizon, late Holocene alluvium.
Zone 3	68–92 cm	Dark gray (10YR 4/1) silty clay loam, firm, moderate medium subangular blocky structure, gradual smooth boundary. Ab horizon, late Holocene alluvium.
Zone 4	92–295 cm	Dark grayish brown (10YR 4/2) silty clay loam, firm, weak medium prismatic breaking to moderate medium angular blocky structure, few $CaCO_3$ filaments, gravel stringer (slightly dispersed, granule-sized) at 184 cm, clear smooth boundary. Bb horizon, late Holocene alluvium.
Zone 5	295–425+ cm	Brown (10YR 5/3) silty clay loam, firm, weak medium prismatic breaking to moderate medium angular blocky structure, few $CaCO_3$ filaments, boundary not observed. Bwb horizon, late Holocene alluvium.

Site 41ML162

Trench 1

Zone 1	0–36 cm	Grayish brown (10YR 5/2) silty clay loam, firm, moderate fine subangular blocky structure, common preserved horizontal laminae, abrupt smooth boundary. AC horizon, recent alluvium.
Zone 2	36–52 cm	Dark gray (10YR 4/1) silty clay loam, firm, moderate fine subangular blocky structure, 10% limestone gravels (matrix-supported, subangular to subrounded, granule-sized), abrupt smooth boundary. Ab horizon, late Holocene alluvium.
Zone 3	52–64 cm	Dark grayish brown (10YR 4/2) gravelly sandy clay loam, firm, weak fine granular structure, 50% limestone gravels (matrix- and clast-supported, angular to subangular, granule- to pebble-sized), Zone 3 pinches out to the

north, abrupt smooth boundary. Bwb horizon, late Holocene colluvium.

Zone 4 64–72 cm Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate fine subangular blocky structure, Zone 4 pinches out to the south, abrupt smooth boundary. Bwb2 horizon, late Holocene alluvium.

Zone 5 72–96 cm Dark grayish brown (10YR 4/2) gravelly sandy clay loam, firm, weak fine granular structure, 50% limestone gravels (matrix- and clast-supported, subangular to subrounded, granule- to pebble-sized), Zone 5 pinches out to the north, abrupt smooth boundary. Bwb3 horizon, late Holocene colluvium.

Zone 6 96–116 cm Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate fine subangular blocky structure, Zone 6 pinches out to the south, abrupt smooth boundary. Bwb4 horizon, late Holocene alluvium.

Zone 7 116–141+ cm Dark grayish brown (10YR 4/2) gravelly sandy clay loam, firm, weak fine granular structure, 50% limestone gravels (matrix- and clast-supported, subangular to subrounded, granule- to pebble-sized), boundary not observed. C horizon, late Holocene colluvium.

Trench 3

Zone 1 0–19 cm Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate fine granular structure, few preserved horizontal laminae, abrupt smooth boundary. AC horizon, recent alluvium.

Zone 2 19–93 cm Black (10YR 2/1) silty clay loam, firm, moderate medium subangular blocky structure, 5% limestone gravels (matrix-supported, angular to subangular, granule- to pebble-sized), few freshwater mussel shell fragments, common burned rocks, gradual smooth boundary. Ab horizon, late Holocene alluvium.

Zone 3 93–143+ cm Yellowish brown (10YR 5/4) silty clay, firm, moderate medium angular blocky structure, 2 percent limestone gravels (matrix-supported, angular, granule- to pebble-sized), boundary not observed. Bwb horizon, late Holocene alluvium.

Trench 4

Zone 1 0–18 cm Dark gray (10YR 4/1) silty clay loam, firm, weak medium granular structure, abrupt smooth boundary. AC horizon, recent alluvium.

Zone 2 18–77 cm Very dark gray (10YR 3/1) silty clay loam, very firm, moderate medium subangular blocky structure, common freshwater mussel shell fragments, common burned rocks, clear smooth boundary. Radiocarbon age on bulk soil from 50–60 cm of 1720 ± 60 B.P. Ab horizon, late Holocene alluvium.

Zone 3 77–105 cm Dark grayish brown (10YR 4/2) clay loam, very firm, moderate medium angular blocky structure, 2% limestone gravel (matrix-supported, angular to subangular, granule- to pebble-sized), clear smooth boundary. Bwb horizon, late Holocene alluvium.

Zone 4 105–127 cm Very dark grayish brown (10YR 3/2) clay loam, very firm, moderate medium angular blocky structure, many burned rocks, common freshwater

mussel shells, few pieces of charcoal, few pieces of lithic debitage, clear smooth boundary. Radiocarbon age on bulk soil from 107–117 cm of 3400 ± 70 B.P. 2Ab horizon, late Holocene alluvium.

Zone 5 127–153 cm Brown (10YR 5/3) silty clay loam, firm, moderate fine angular blocky structure, 5% limestone gravels (matrix-supported, angular to subangular, granule- to pebble-sized), clear smooth boundary. 2Bb horizon, late Holocene alluvium and colluvium.

Zone 6 153–180+ cm Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate medium angular blocky structure, common freshwater mussel shells, common snail (*Rabdotus* sp.) shells, 10% limestone gravels (matrix-supported, angular to subangular, granule-sized), boundary not observed. 3ABb horizon, late Holocene alluvium and colluvium.

Site 41ML185

Trench 1

Zone 1 0–94 cm Alternating medium beds to thin laminae of pale brown (10YR 6/3) very fine sand and dark gray (10YR 4/1) mud, very abrupt smooth boundary. C horizon, recent alluvium.

Zone 2 94–154 cm Very dark grayish brown (10YR 3/2) silty clay loam, firm, moderate medium subangular blocky structure, few pieces of charcoal, moderately bioturbated (microfaunal burrowing), clear smooth boundary. Ab horizon, late Holocene alluvium.

Zone 3 154–254+ cm Yellowish brown (10YR 5/4) silty clay loam, firm, moderate medium prismatic breaking to moderate medium angular blocky structure, many distinct coarse (10YR 5/2) mottles, common $CaCO_3$ filaments, boundary not observed. Bwkb horizon, late Holocene alluvium.

Trench 2

Zone 1 0–80 cm Alternating thin beds to thin laminae of pale brown (10YR 6/3) very fine sand and dark gray (10YR 4/1) mud, common charcoal lenses, upper 50 cm of zone is bioturbated, mud beds of lower 30 cm of zone display common distinct fine (7.5YR 4/4) mottles, very abrupt smooth boundary. C horizon, recent alluvium.

Zone 2 80–125 cm Very dark grayish brown (10YR 3/2) silty clay loam, firm, moderate medium subangular blocky structure, common faint fine (10YR 4/3) mottles, many snail (*Rabdotus* sp.) shells, many freshwater mussel shell fragments, common burned rocks, common pieces of charcoal, heavily bioturbated (microfaunal burrowing), clear smooth boundary. Radiocarbon age on bulk soil from 101–109 cm of 1130 ± 80 B.P. Ab horizon, late Holocene alluvium.

Zone 3 125–300+ cm Yellowish brown (10YR 5/4) silty clay loam, firm, moderate medium subangular blocky structure, many distinct coarse (10YR 5/2) mottles that become more prominent with depth, few $CaCO_3$ filaments, few freshwater mussel shell fragments, individual burned rocks at 148 and 239 cm, boundary not observed. Bwb horizon, late Holocene alluvium.

Site 41ML186

Trench 1

Zone 1	0–30 cm	Alternating beds and laminae of yellowish brown (10YR 5/4) sand and dark grayish brown (10YR 4/2) mud, clear smooth boundary. C horizon, recent alluvium.
Zone 2	30–83 cm	Brown (10YR 4/3) fine sandy clay loam, firm, weak fine subangular blocky structure, abrupt smooth boundary. AC horizon, late Holocene alluvium.
Zone 3	83–104 cm	Grayish brown (10YR 5/2) silty clay, firm, moderate fine subangular blocky structure, few pieces of charcoal, abrupt smooth boundary. Ab horizon, late Holocene alluvium.
Zone 4	104–140 cm	Brown (10YR 5/3) fine sandy clay loam, friable, moderate fine subangular blocky structure, few poorly preserved sand and mud laminae, clear smooth boundary. C horizon, late Holocene alluvium.
Zone 5	140–170 cm	Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate medium subangular blocky structure, few $CaCO_3$ filaments, clear smooth boundary. 2Ab horizon, late Holocene alluvium.
Zone 6	170–357+ cm	Brown (10YR 5/3) silty clay loam, firm, moderate medium angular blocky structure, common $CaCO_3$ filaments, one freshwater mussel shell fragment at 204 cm, boundary not observed. 2Bkb horizon, late Holocene alluvium.

Trench 2

Zone 1	0–58 cm	Alternating horizontal beds of yellowish brown (10YR 5/4) sand and dark grayish brown (10YR 4/2) mud, abrupt smooth boundary. C horizon, recent alluvium.
Zone 2	58–102 cm	Brown (10YR 5/3) fine sandy clay loam, friable, weak fine subangular blocky structure, poorly preserved beds of sand and mud, heavily bioturbated, abrupt smooth boundary. AC horizon, late Holocene alluvium.
Zone 3	102–143 cm	Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate fine subangular blocky structure, few poorly preserved thin sand beds, clear smooth boundary. AC horizon, late Holocene alluvium.
Zone 4	143–201 cm	Very dark grayish brown (10YR 3/2) silty clay loam, firm, moderate medium angular blocky structure, 2% limestone gravels (matrix-supported, subangular, granule- to pebble-sized), few $CaCO_3$ filaments, clear smooth boundary. Ab horizon, late Holocene alluvium.
Zone 5	201–369+ cm	Pale brown (10YR 6/3) silty clay, firm, weak medium prismatic breaking to moderate medium angular blocky structure, common $CaCO_3$ filaments, boundary not observed. Bkb horizon, late Holocene alluvium.

Trench 5

Zone 1	0–55 cm	Alternating beds and laminae of yellowish brown (10YR 5/4) fine to medium sand and grayish brown (10YR 5/2) mud, abrupt smooth boundary. C horizon, recent alluvium.

Zone 2	55–120 cm	Dark grayish brown (10YR 4/2) sandy clay loam, firm, weak fine subangular blocky structure, few poorly preserved thin sand beds, few pieces of charcoal, clear smooth boundary. Ab horizon, late Holocene alluvium.
Zone 3	120–254 cm	Brown (10YR 5/3) silt loam, friable, moderate medium subangular blocky structure, few poorly preserved sand beds, few $CaCO_3$ filaments, few pieces of charcoal, clear smooth boundary. C horizon, late Holocene alluvium.
Zone 4	254–288 cm	Dark grayish brown (10YR 4/2) silty clay loam, firm, weak medium prismatic breaking to moderate fine angular blocky structure, few $CaCO_3$ filaments, thin bed of granule- to pebble-sized, subrounded to rounded gravels at 276 cm, clear smooth boundary. 2Ab horizon, late Holocene alluvium.
Zone 5	288–352+ cm	Brown (10YR 5/3) very gravelly silty clay loam, firm, weak medium prismatic breaking to moderate fine angular blocky structure, common $CaCO_3$ filaments, >50% limestone gravels (granule- to cobble-sized, rounded to subrounded) at 324–352+ cm, boundary not observed. 2Bb horizon, late Holocene alluvium.

Site 41ML194

Trench 2

Zone 1	0–18 cm	Grayish brown (10YR 5/2), silty clay, firm, weak fine subangular blocky structure, few very thin beds of fine to coarse sand, very abrupt smooth boundary. C horizon, recent alluvium.
Zone 2	18–48 cm	Dark gray (10YR 4/1) silty clay loam, firm, moderate medium subangular blocky structure, abrupt smooth boundary. Ab horizon, late Holocene alluvium.
Zone 3	48–84 cm	Brown (10YR 5/3) sandy loam, friable, weak medium subangular blocky structure, clear smooth boundary. C horizon, late Holocene alluvium.
Zone 4	84–110 cm	Dark grayish brown (10YR 4/2) silty clay loam, friable, moderate medium subangular blocky structure, clear smooth boundary. 2Ab horizon, late Holocene alluvium.
Zone 5	110–304 cm	Brown (10YR 5/3) silt loam, friable, weak fine subangular blocky structure, common poorly preserved thin beds of fine to medium (10YR 7/4) sand, clear smooth boundary. 2C horizon, late Holocene alluvium.
Zone 6	304–324+ cm	Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate medium subangular blocky structure, thin bed of gravel at 314 cm, boundary not observed. 3Ab horizon, late Holocene alluvium.

Trench 3

Zone 1	0–18 cm	Grayish brown (10YR 5/2) silty clay, firm, weak fine subangular blocky structure, few thin beds of fine to coarse sand, abrupt smooth boundary. C horizon, recent alluvium.
Zone 2	18–41 cm	Dark grayish brown (10YR 4/2) silty clay loam, firm, weak medium subangular blocky structure, clear smooth boundary. Ab horizon, late Ho-

locene alluvium.

Zone 3 41–155 cm Brown (10YR 4/3) sandy clay loam, friable, weak fine subangular blocky structure, few poorly preserved very thin to thin beds of fine to medium quartz sand, clear smooth boundary. C horizon, late Holocene alluvium.

Zone 4 155–255 cm Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate medium subangular blocky structure, two thin lenses of ash, charcoal, and oxidized sediment at 206 and 217 cm, clear smooth boundary. 2Ab horizon, late Holocene alluvium.

Zone 5 255–270+ cm Dark gray (10YR 4/1) silty clay loam, firm, moderate medium angular blocky structure, many insect burrow casts, boundary not observed. 3Ab horizon, late Holocene alluvium.

Trench 6

Zone 1 0–16 cm Brown (10YR 5/3) silty clay, firm, weak fine subangular blocky structure, thin bed of fine to medium sand at 16 cm, abrupt wavy boundary. C horizon, recent alluvium.

Zone 2 16–41 cm Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate fine subangular blocky structure, clear smooth boundary. Ab horizon, late Holocene alluvium.

Zone 3 41–85 cm Brown (10YR 5/3) silty clay, firm, weak fine subangular blocky structure, few poorly preserved very thin to thin beds of fine to medium quartz sand, clear smooth boundary. C horizon, late Holocene alluvium.

Zone 4 85–156 cm Dark gray (10YR 4/1) silty clay loam, firm, moderate medium angular blocky structure, clear smooth boundary. Radiocarbon age on bulk soil from 114–122 cm of 1070 ± 80 B.P. 2Ab horizon, late Holocene alluvium.

Zone 5 156–306 cm Dark grayish brown (10YR 4/2) silty clay, friable, moderate medium angular blocky structure, few $CaCO_3$ filaments, clear smooth boundary. 2Bwb horizon, late Holocene alluvium.

Zone 6 306–330+ cm Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate medium prismatic breaking to moderate medium angular blocky structure, few $CaCO_3$ filaments, boundary not observed. 2Bb horizon, late Holocene alluvium.

Site 41ML195

Trench 1

Zone 1 0–18 cm Dark grayish brown (10YR 4/2) silty clay loam, firm, weak fine subangular blocky structure, discontinuous very thin bed of medium to coarse sand-sized quartz and carbonate clasts at 18 cm, abrupt wavy boundary. C horizon, recent alluvium.

Zone 2 18–46 cm Very dark grayish brown (10YR 3/2) sandy clay loam, friable, weak medium subangular blocky structure, discontinuous thin bed of coarse sand-sized quartz, carbonate clasts, and fossilized shell, clear smooth boundary. Ab

horizon, late Holocene alluvium.

Zone 3	46–96 cm	Dark grayish brown (10YR 4/2) very fine sandy clay loam, firm, weak medium subangular blocky structure, sand component coarsens down profile to a coarse sand, clear smooth boundary. Bwb horizon, late Holocene alluvium.
Zone 4	96–200 cm	Very dark grayish brown (10YR 3/2) fine to medium sandy loam, friable, weak fine subangular blocky structure, clear smooth boundary. Bwb2 horizon, late Holocene alluvium.
Zone 5	200–250+ cm	Dark grayish brown (10YR 4/2) silty clay loam, firm, moderate fine subangular blocky structure, few $CaCO_3$ filaments, common freshwater mussel shells, common pieces of charcoal, and common burned rocks at 235–240 cm, boundary not observed. 2Ab horizon, late Holocene alluvium.

Trench 3

Zone 1	0–19 cm	Grayish brown (10YR 5/2) clay loam, firm, weak fine subangular blocky structure, thin bed of medium to coarse sand-sized quartz and carbonate clasts at 19 cm, abrupt wavy boundary. C horizon, recent alluvium.
Zone 2	19–36 cm	Very dark grayish brown (10YR 3/2) silty clay loam, firm, moderate fine subangular blocky structure, clear smooth boundary. Ab horizon, late Holocene alluvium.
Zone 3	36–190 cm	Dark grayish brown (10YR 4/2) coarse to very coarse sandy clay loam, friable, moderate medium angular blocky structure, 2% limestone gravels (slightly bedded, subrounded to rounded, granule-sized), abrupt smooth boundary. Bwb horizon, late Holocene alluvium.
Zone 4	190–242+ cm	Dark grayish brown (10YR 4/2) clay loam, very firm, moderate medium angular blocky structure, few $CaCO_3$ filaments, 2% limestone gravels (matrix-supported, rounded, granule-sized), boundary not observed. 2Ab horizon, late Holocene alluvium.

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APPENDIX B: INVERTEBRATE FAUNAL ANALYSIS

Karen M. Gardner

This analysis focuses on the invertebrate faunal remains, specifically the freshwater mussel shells recovered during the excavations (Table 18). All of the shells recovered from each site were reviewed, but only complete valves or umbo fragments were looked at more closely for species identification. Fragments, tooth fragments, and umbo fragments that are too fragmentary for identification (whether due to breakage or poor preservation) were quantified, but no attempt at identification was made. All of the mussel shells were examined for evidence of cultural modification.

Amblema plicata (Threeridge)

Amblema plicata, a member of the family Unionidae, is a common species, ranging from the San Antonio and Guadalupe River systems through central, north, and east Texas. It typically is found on a variety of substrates ranging from silt and mud to gravel and cobbles at water depths of 2.5 cm to 3.0 m in small streams, the headwaters and shallower sections of larger rivers, and reservoirs. This species is known to tolerate a lower water quality than other species (Howells et al. 1996:33–35; Parmalee 1967:26).

Cyrtonaias tampicoensis (Tampico Pearlymussel)

Cyrtonaias tampicoensis, a member of the family Unionidae, is found in many of the major river systems of Texas, including the Brazos and Trinity. It usually is found on mud, mud and sand, or mud and gravel substrates, and occasionally those of cobble or rock. It prefers slow-flowing, mud-bottomed rivers or gravel-bottomed streams with swifter currents, and it has been known to adapt well to some reservoir environments (Howells et al. 1996:48–50).

Leptodea fragilis (Fragile Papershell)

Leptodea fragilis, a member of the family Unionidae, is a common species in central, north, and east Texas. It is found on mud, gravel, mud and gravel, and occasionally sand, silt, or rocky substrates, in both shallow and deep waters. It is an adaptable species and is found in a variety of environments, ranging from small streams to large rivers, in clear or murky waters, and in still to swiftly flowing waters, although it is more common in quieter waters (Howells et al. 1996:75–76; Parmalee 1967:72).

Potamilus pupuratus (Bleufer)

Potamilus purpuratus, a member of the family Unionidae, is found in Texas from the Guadalupe River basin into the north and east. It is found in deep-water streams or rivers with slow to moderate currents, or in reservoirs or slow-moving sloughs at depths from ca. 0.5 to 3.0 m. It favors mud substrates or a fine to medium gravel interspersed with mud (Howells et al. 1996:100–102).

Quadrula apiculata (Southern Mapleleaf)

Quadrula apiculata, a member of the family Unionidae, is a common species in Texas and has been documented in all major river drainages. It is found on a variety of substrates, including mud, mud and sand, mud and gravel, and mud, gravel, and cobbles. It occurs in flowing waters in rivers and streams, as well as in slow-moving canals and still-water reservoirs. It can be found at depths of up to 4.6 m, but also is common in much shallower waters (Howells et al. 1996:105–106).

Quadrula petrina (Texas pimpleback)

Quadrula petrina, a member of the family Unionidae, is found primarily in the Guadalupe and Colorado River systems, but it also has been noted elsewhere. It prefers mud and gravel substrates in slow-moving water, but also has been found on sand and gravel substrates in shallow flowing waters. It typically is found in shallow waters, at depths of 0.5 to 1.0 m (Howells et al. 1996:119–120).

Tritogonia verrucosa (Pistolgrip)

Tritogonia verrucosa, a member of the family Unionidae, has been noted from the San Antonio River drainage into east and north Texas. It has been noted on a variety of substrates,

Table 18. Provenience of invertebrate faunal remains

Provenience	Quantity	Taxon	Description
41ML135			
Test Unit 4, Level 1	2	unidentified	fragments
41ML140			
Test Unit 1, Feature 5, Level 2	6	unidentified	fragments, 1 fossilized
Test Unit 1, Feature 5, Level 3	1	unidentified	fragment
Test Unit 1, Feature 5, Level 3	1	fossilized oyster	umbo fragment
Test Unit 6, Feature 5, Level 2	3	unidentified	fragments, possibly cut (?)
Test Unit 6, Feature 5, Level 3	6	unidentified	fragments, possibly cut (?)
41ML160			
Test Unit 1, Level 5	1	unidentified	eroded umbo fragment
Test Unit 1, Level 10	1	*Quadrula* sp.	umbo fragment
Test Unit 1, Level 10	1	unidentified	fragment
Test Unit 1, Level 18	1	*Amblema plicata*	umbo fragment (in two pieces)
Test Unit 1, Level 22	1	*Amblema plicata*	nearly complete valve
Test Unit 1, Level 27	2	unidentified	fragments
Test Unit 1, Level 30	1	unidentified	fossilized fragment
Test Unit 1, Level 34	2	*Quadrula petrina*	1 complete valve, 1 umbo fragment
Test Unit 1, Level 34	1	unidentified	fragment
Test Unit 2, Level 32	1	*Leptodea fragilis*	complete valve
Test Unit 2, Level 32	1	*Amblema plicata*	umbo fragment
Test Unit 3, Level 12	1	*Amblema plicata*	nearly complete valve
Test Unit 3, Level 14	4	*Amblema plicata*	umbo fragments
Test Unit 3, Level 15	2	*Amblema plicata*	umbo fragments, weathered
Test Unit 3, Level 16	2	unidentified	umbo fragments, too eroded to ID
Test Unit 3, Level 21	2	*Amblema plicata*	umbo fragments
Test Unit 3, Level 21	1	*Quadrula petrina*	complete valve
Test Unit 4, Level 5	1	*Cyrtonaias tampicoensis*	nearly complete valve
Test Unit 4, Level 14	1	*Tritogonia verrucosa*	nearly complete valve
Test Unit 4, Level 14	4	*Amblema plicata*	umbo fragments
Test Unit 4, Level 14	2	unidentified	fragments
Test Unit 4, Level 15	1	unidentified	umbo fragment, too eroded to ID
Test Unit 4, Level 16	1	*Amblema plicata*	umbo fragment
Test Unit 4, Level 16	3	unidentified	umbo fragments, too eroded to ID
Test Unit 4, Level 20	3	*Amblema plicata*	umbo fragments
Test Unit 4, Level 20	1	*Quadrula* sp.	umbo fragment
Test Unit 4, Level 21	1	*Quadrula petrina*	complete valve
Test Unit 4, Level 22	1	*Amblema plicata*	umbo fragment
41ML162			
Test Unit 1, Level 5	1	*Amblema plicata*	umbo fragment
Test Unit 1, Level 5	2	unidentified	umbo fragments, too eroded to ID
Test Unit 1, Level 6	1	*Amblema plicata*	umbo fragment
Test Unit 1, Level 6	1	unidentified	1 umbo fragment/5 fragments, too eroded to ID
Test Unit 1, Level 7	1	unidentified	1 umbo fragment/14 fragments, too eroded to ID
Test Unit 1, Level 8	3	*Amblema plicata*	umbo fragments
Test Unit 1, Level 8	1	unidentified	umbo fragment, too small to ID
Test Unit 1, Level 9	1	*Amblema plicata*	nearly complete valve
Test Unit 1, Level 9	3	unidentified	3 umbo fragments/3 fragments, too eroded to ID
Test Unit 1, Level 10	1	*Leptodea fragilis*	umbo fragment
Test Unit 1, Level 10	3	*Tritogonia verrucosa*	umbo fragments
Test Unit 1, Level 10	2	*Amblema plicata*	umbo fragments
Test Unit 1, Level 10	2	unidentified	umbo fragments, too small/eroded to ID
Test Unit 1, Level 11	5	*Amblema plicata*	umbo fragments
Test Unit 1, Level 11	1	*Potamilus purpuratus*	umbo fragment
Test Unit 1, Level 11	1	*Leptodea fragilis*	umbo fragment
Test Unit 1, Level 11	1	*Quadrula* sp.	umbo fragment
Test Unit 1, Level 11	9	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 1, Level 12	1	*Amblema plicata*	eroded umbo fragment
Test Unit 1, Level 12	2	unidentified	umbo fragments, too eroded to ID

Table 18, continued

Provenience	Quantity	Taxon	Description
Test Unit 1, Level 13	1	*Amblema plicata*	umbo fragment
Test Unit 1, Level 14	1	*Amblema plicata*	umbo fragment
Test Unit 1, Level 14	1	*Quadrula* sp.	umbo fragment
Test Unit 1, Level 14	1	unidentified	umbo fragment, too eroded to ID
Test Unit 1, Level 15	1	*Amblema plicata*	umbo fragment
Test Unit 2, Level 3	2	*Amblema plicata*	umbo fragments
Test Unit 2, Level 3	3	unidentified	umbo fragments, too eroded to ID
Test Unit 7, Level 4	27	*Amblema plicata*	umbo fragments
Test Unit 7, Level 4	8	*Quadrula petrina*	umbo fragments
Test Unit 7, Level 4	1	*Potamilus purpuratus*	umbo fragment
Test Unit 7, Level 4	2	*Tritogonia verrucosa*	umbo fragments
Test Unit 7, Level 4	19	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 2, Level 5	24	*Amblema plicata*	umbo fragments
Test Unit 2, Level 5	6	*Quadrula petrina*	umbo fragments
Test Unit 2, Level 5	3	*Quadrula* sp.	umbo fragments
Test Unit 2, Level 5	3	*Tritogonia verrucosa*	umbo fragments
Test Unit 2, Level 5	4	*Potamilus* sp.	umbo fragments
Test Unit 2, Level 5	2	*Leptodea fragilis*	umbo fragments
Test Unit 2, Level 5	13	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 2, Level 6	1	*Amblema plicata*	umbo fragment
Test Unit 2, Level 6	2	*Tritogonia verrucosa*	umbo fragments
Test Unit 2, Level 6	1	*Quadrula* sp.	umbo fragment
Test Unit 2, Level 8	1	*Quadrula petrina*	umbo fragment
Test Unit 2, Level 10	2	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 2, Level 12	1	*Quadrula* sp.	umbo fragment
Test Unit 2, Level 14	3	unidentified	umbo fragments, too eroded to ID
Test Unit 3, Level 3	84	*Amblema plicata*	umbo fragments
Test Unit 3, Level 3	6	*Leptodea fragilis*	umbo fragments, nearly complete valves
Test Unit 3, Level 3	2	*Potamilus purpuratus*	umbo fragments
Test Unit 3, Level 3	8	*Tritogonia verrucosa*	umbo fragments
Test Unit 3, Level 3	16	*Quadrula petrina*	umbo fragments
Test Unit 3, Level 3	18	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 3, Level 4	18	*Amblema plicata*	umbo fragments
Test Unit 3, Level 4	7	*Quadrula petrina*	umbo fragments
Test Unit 3, Level 4	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 3, Level 4	4	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 3, Level 5	19	*Amblema plicata*	umbo fragments
Test Unit 3, Level 5	5	*Quadrula petrina*	umbo fragments
Test Unit 3, Level 5	1	*Cyrtonaias tampicoensis*	umbo fragment
Test Unit 3, Level 5	3	*Tritogonia verrucosa*	umbo fragments
Test Unit 3, Level 5	1	*Leptodea fragilis*	umbo fragment
Test Unit 3, Level 5	1	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 3, Level 6	10	*Amblema plicata*	umbo fragments
Test Unit 3, Level 6	1	*Leptodea fragilis*	umbo fragment
Test Unit 3, Level 6	1	*Tritogonian verrucosa*	umbo fragment
Test Unit 3, Level 7	19	*Amblema plicata*	umbo fragments, nearly complete valves
Test Unit 3, Level 7	2	*Tritogonia verrucosa*	umbo fragments
Test Unit 3, Level 7	4	*Quadrula petrina*	umbo fragments
Test Unit 3, Level 7	5	*Leptodea fragilis*	umbo fragments
Test Unit 3, Level 7	4	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 3, Level 8	12	*Amblema plicata*	umbo fragments, nearly complete valves
Test Unit 3, Level 8	3	*Quadrula petrina*	umbo fragments
Test Unit 3, Level 8	4	*Leptodea fragilis*	nearly complete valves
Test Unit 3, Level 8	2	*Tritogonia verrucosa*	umbo fragments
Test Unit 3, Level 8	7	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 3, Level 9	4	*Amblema plicata*	umbo fragments
Test Unit 3, Level 9	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 3, Level 9	1	unidentifed	umbo fragment/fragments, too eroded to ID
Test Unit 3, Level 10	4	unidentifed	umbo fragments/fragments, too eroded to ID
Test Unit 3, Level 11	2	*Amblema plicata*	umbo fragments
Test Unit 3, Level 12	1	*Amblema plicata*	umbo fragment
Test Unit 4, Level 3	1	*Amblema plicata*	umbo fragment
Test Unit 4, Level 4	2	*Quadrula petrina*	umbo fragments
Test Unit 4, Level 4	11	unidentified	umbo fragments/fragments, too eroded to ID

Table 18, continued

Provenience	Quantity	Taxon	Description
Test Unit 4, Level 5	9	*Amblema plicata*	umbo fragments
Test Unit 4, Level 5	3	*Quadrula petrina*	umbo fragments
Test Unit 4, Level 5	3	*Potamilus purpuratus*	umbo fragments
Test Unit 4, Level 5	1	*Leptodea fragilis*	complete valve
Test Unit 4, Level 5	17	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 6	7	*Amblema plicata*	umbo fragments
Test Unit 4, Level 6	4	*Quadrula petrina*	umbo fragments
Test Unit 4, Level 6	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 4, Level 6	17	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 7	1	*Tritogonia verrucosa*	nearly complete valve
Test Unit 4, Level 7	4	*Quadrula petrina*	umbo fragments
Test Unit 4, Level 7	6	*Amblema plicata*	umbo fragments
Test Unit 4, Level 7	43	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 8	1	unidentified	umbo fragment/fragments, too eroded to ID
Test Unit 4, Level 9	5	unidentified	umbo fragment/fragments, too eroded to ID
Test Unit 4, Level 10	5	unidentified	umbo fragment/fragments, too eroded to ID
Test Unit 4, Level 11	4	*Quadrula* sp.	umbo fragments
Test Unit 4, Level 11	1	*Amblema plicata*	umbo fragment
Test Unit 4, Level 11	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 4, Level 11	20	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 12	3	*Amblema plicata*	umbo fragments
Test Unit 4, Level 12	1	*Quadrula apiculata*	complete valve
Test Unit 4, Level 12	1	*Leptodea fragilis*	umbo fragment
Test Unit 4, Level 12	9	*Quadrula* sp.	umbo fragments
Test Unit 4, Level 12	17	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 13	7	*Amblema plicata*	umbo fragments
Test Unit 4, Level 13	8	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 14	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 4, Level 14	1	*Quadrula* sp.	umbo fragment
Test Unit 4, Level 14	2	*Amblema plicata*	umbo fragments
Test Unit 4, Level 14	10	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 15	14	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 16	24	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 17	1	*Amblema plicata*	umbo fragment
Test Unit 4, Level 17	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 4, Level 17	12	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 18	22	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 5, Level 5	1	*Leptodea fragilis*	umbo fragment
Test Unit 5, Level 5	1	*Quadrula petrina*	umbo fragment
Test Unit 5, Level 5	1	*Amblema plicata*	umbo fragment
Test Unit 5, Level 6	5	*Amblema plicata*	umbo fragments
Test Unit 5, Level 6	1	*Potamilus* sp.	umbo fragment
Test Unit 5, Level 7	2	unknown	umbo fragments, cannot ID
Test Unit 5, Level 8	1	unidentified	umbo fragment
Test Unit 5, Level 9	3	*Quadrula petrina*	umbo fragments
Test Unit 5, Level 9	3	*Tritogonia verrucosa*	umbo fragments
Test Unit 5, Level 9	11	*Amblema plicata*	umbo fragments
Test Unit 5, Level 9	17	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 5, Level 10	1	*Leptodea fragilis*	umbo fragment
Test Unit 5, Level 10	4	*Amblema plicata*	umbo fragments
Test Unit 5, Level 10	1	oyster	umbo fragment
Test Unit 5, Level 10	3	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 5, Level 11	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 5, Level 11	1	*Amblema plicata*	umbo fragment
Test Unit 5, Level 11	2	unidentified	umbo fragments, too small to ID
Test Unit 3, Feature 1, Level 5	4	unidentified	umbo fragments, too small to ID
41ML185			
Test Unit 1, Level 10	1	unidentified	umbo fragment, too small to ID
Test Unit 1, Level 11	3	unidentified	umbo fragments, too small to ID
Test Unit 1, Level 12	1	unidentified	umbo fragment, too small to ID
Test Unit 1, Level 13	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 1, Level 14	3	*Amblema plicata*	umbo fragments
Test Unit 1, Level 15	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 1, Level 17	1	unidentified	umbo fragment/fragments, too small to ID

Table 18, continued

Provenience	Quantity	Taxon	Description
Test Unit 2, Level 11	1	unidentified	umbo fragment, too small to ID
Test Unit 2, Level 12	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 2, Level 14	1	unidentified	umbo fragment, too small to ID
Test Unit 3, Level 2	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 3, Level 3	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 3, Level 4	2	unidentified	umbo fragments/fragments, too small to ID
Test Unit 3, Level 5	4	unidentified	umbo fragments/fragments, too small to ID
Test Unit 3, Level 6	7	unidentified	umbo fragments/fragments, too small to ID
Test Unit 3, Level 7	8	unidentified	umbo fragments/fragments, too small to ID
Test Unit 3, Level 8	5	unidentified	fragments
Test Unit 3, Level 9	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 3, Level 10	1	unidentified	fragment
Test Unit 3, Level 11	3	unidentified	umbo fragments/fragments, too small to ID
Test Unit 3, Level 12	3	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 3, Level 13	2	unidentified	umbo fragments/fragments, too small to ID
Test Unit 3, Level 14	10	unidentified	fragments
Test Unit 4, Level 1	1	unidentified	cardinal tooth fragment
Test Unit 4, Level 2	8	unidentified	umbo fragments, too eroded to ID
Test Unit 4, Level 3	2	unidentified	umbo fragments/fragments, too small to ID
Test Unit 4, Level 4	3	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 5	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 4, Level 6	5	unidentified	umbo fragments/fragments, too small to ID
Test Unit 4, Level 7	3	*Tritogonia verrucosa*	umbo fragments, extremely weathered
Test Unit 4, Level 7	6	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 8	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 4, Level 9	4	unidentified	fragments
Test Unit 4, Level 10	1	unidentified	fragment
Test Unit 4, Level 11	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 4, Level 12	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 4, Level 13	2	unidentified	umbo fragments/fragments, too small to ID
Test Unit 4, Level 14	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 5, Level 3	2	*Amblema plicata*	umbo fragments
Test Unit 5, Level 3	2	*Quadrula* sp.	umbo fragments
Test Unit 5, Level 3	5	unidentified	umbo fragments/fragments, too small to ID
Test Unit 5, Level 4	3	unidentified	umbo fragments/fragments, too small to ID
Test Unit 5, Level 5	1	*Tritogonia verrucosa*	nearly complete valve
Test Unit 5, Level 5	2	*Amblema plicata*	umbo fragments
Test Unit 5, Level 5	11	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 5, Level 6	1	*Amblema plicata*	umbo fragment
Test Unit 5, Level 6	1	*Quadrula petrina*	umbo fragment
Test Unit 5, Level 6	1	*Leptodea fragilis*	umbo fragment
Test Unit 5, Level 6	26	unidentified	umbo fragments/fragments, too small/eroded to ID
Test Unit 5, Level 7	2	*Amblema plicata*	umbo fragments
Test Unit 5, Level 7	20	unidentified	umbo fragments/fragments, too small/eroded to ID
Test Unit 5, Level 8	4	*Amblema plicata*	umbo fragments, badly weathered
Test Unit 5, Level 8	2	*Tritogonia verrucosa*	umbo fragments, badly weathered
Test Unit 5, Level 8	7	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 5, Level 9	7	*Amblema plicata*	umbo fragments, weathered with deposit buildup
Test Unit 5, Level 9	2	*Tritogonia verrucosa*	umbo fragments, weathered with deposit buildup
Test Unit 5, Level 9	11	unidentified	umbo fragments/fragments, too eroded/too much deposit buildup to ID
Test Unit 5, Level 10	1	*Amblema plicata*	umbo fragments
Test Unit 5, Level 10	8	unidentified	umbo fragments, too eroded to ID
Test Unit 5, Level 11	1	*Amblema plicata*	umbo fragment
Test Unit 5, Feature 1, Levels 6–7, flotation sample	5	unidentified	umbo fragments, too small and eroded to ID
Test Unit 5, Feature 2, Level 7, flotation sample	3	unidentified	umbo fragments, too small and eroded to ID
41ML186			
Test Unit 1, Level 12	3	unidentified	1 umbo fragment, 2 fragments too eroded to ID
Test Unit 2, Level 11	1	unidentified	umbo fragment, too eroded to ID
Test Unit 3, Level 11	2	unidentified	fragments, too eroded to ID
Test Unit 3, Level 13	1	*Quadrula* sp.	umbo fragment

Table 18, continued

Provenience	Quantity	Taxon	Description
Test Unit 3, Level 14	1	*Cyrtonaias tampicoensis*	umbo fragment
Test Unit 3, Level 15	1	unidentified	umbo fragment, too eroded to ID
Test Unit 4, Level 12	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 4, Level 15	2	unidentified	1 umbo fragment, 1 fragment too eroded to ID
Test Unit 4, Level 27	1	*Quadrula petrina*	umbo fragment
Test Unit 4, Level 29	1	*Quadrula* sp.	umbo fragment
Test Unit 4, Level 29	3	unidentified	umbo fragments, too eroded to ID
41ML194			
Test Unit 3, Level 22	8	unidentified	fragments
Test Unit 4, Level 17	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 4, Level 19	1	unidentified	umbo fragment, too eroded to ID
Test Unit 4, Level 21	2	unidentified	umbo fragments, too eroded to ID
Test Unit 5, Level 5	1	unidentified	umbo fragment, too eroded to ID
Test Unit 5, Level 17	2	unidentified	umbo fragments, too eroded to ID
Test Unit 5, Level 18	1	*Amblema plicata*	umbo fragment
Test Unit 5, Level 19	3	unidentified	2 umbo fragments, 1 fragment too eroded to ID
Test Unit 5, Level 22	2	unidentified	fragments
Test Unit 5, Level 24	1	unidentified	umbo fragment, too eroded to ID
Test Unit 6, Level 16	1	unidentified	umbo fragment, too eroded to ID
Test Unit 6, Level 17	3	unidentified	fragments
Test Unit 6, Level 18	1	*Quadrula* sp.	umbo fragment
Test Unit 6, Level 18	1	unidentified	umbo fragment, too eroded to ID
Test Unit 6, Level 19	3	unidentified	fragments
41ML195			
Test Unit 1, Level 2	1	unidentified	umbo fragment, too small to ID
Test Unit 1, Level 5	1	unidentified	fragment
Test Unit 1, Level 6	1	*Amblema plicata*	umbo fragment
Test Unit 1, Level 8	1	unidentified	umbo fragment, too small to ID
Test Unit 1, Level 11	1	*Quadrula apiculata*	umbo fragment
Test Unit 1, Level 11	1	*Cyrtonaias tampicoensis*	umbo fragment, eroded
Test Unit 1, Level 12	1	*Amblema plicata*	umbo fragment
Test Unit 1, Level 12	1	*Quadrula petrina*	umbo fragment
Test Unit 1, Level 12	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 1, Level 14	1	*Amblema plicata*	umbo fragment
Test Unit 1, Level 14	2	unidentified	umbo fragments, too eroded to ID
Test Unit 1, Level 15	3	*Amblema plicata*	umbo fragments
Test Unit 1, Level 15	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 1, Level 15	1	*Quadrula apiculata*	umbo fragment
Test Unit 1, Level 15	1	*Leptodea* sp.	umbo fragment
Test Unit 1, Level 15	2	*Quadrula* sp.	umbo fragments
Test Unit 1, Level 15	1	unidentified	umbo fragment, too eroded to ID
Test Unit 1, Level 16	3	*Amblema plicata*	umbo fragments
Test Unit 1, Level 16	5	unidentified	umbo fragments, too eroded to ID
Test Unit 1, Level 17	4	*Amblema plicata*	umbo fragments
Test Unit 1, Level 17	1	*Leptodea fragilis*	umbo fragment
Test Unit 1, Level 17	1	oyster	umbo fragment
Test Unit 1, Level 17	4	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 1, Level 18	45	*Amblema plicata*	umbo fragments
Test Unit 1, Level 18	4	*Tritogonia verrucosa*	umbo fragments
Test Unit 1, Level 18	2	*Quadrula apiculata*	umbo fragments
Test Unit 1, Level 18	9	*Quadrula* sp.	umbo fragments
Test Unit 1, Level 18	1	*Leptodea fragilis*	umbo fragment
Test Unit 1, Level 18	52	unidentifed	umbo fragments/fragments, too small/eroded to ID
Test Unit 1, Level 19	12	*Amblema plicata*	umbo fragments
Test Unit 1, Level 19	1	*Leptodea fragilia*	umbo fragment
Test Unit 1, Level 19	1	*Quadrula apiculata*	umbo fragment
Test Unit 1, Level 19	1	*Potamilus* sp.	umbo fragment
Test Unit 1, Level 19	5	*Quadrula* sp.	umbo fragments
Test Unit 1, Level 19	46	unidentified	umbo fragments/fragments, too small/eroded to ID
Test Unit 1, Level 20	30	*Amblema plicata*	umbo fragments
Test Unit 1, Level 20	1	*Potamilus purpuratus*	umbo fragment
Test Unit 1, Level 20	1	*Leptodea fragilis*	umbo fragment
Test Unit 1, Level 20	1	*Tritogonia verrucosa*	umbo fragment

Table 18, continued

Provenience	Quantity	Taxon	Description
Test Unit 1, Level 20	4	*Quadrula* sp.	umbo fragments
Test Unit 1, Level 20	2	*Quadrula petrina*	umbo fragments
Test Unit 1, Level 20	30	unidentified	umbo fragments/fragments, too small/eroded to ID
Test Unit 1, Level 21	5	*Amblema plicata*	umbo fragments
Test Unit 1, Level 21	1	*Leptodea fragilis*	umbo fragment
Test Unit 1, Level 21	5	unidentified	umbo fragments, too eroded to ID
Test Unit 2, Level 8	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 2, Level 11	2	*Amblema plicata*	umbo fragments
Test Unit 2, Level 11	1	*Quadrula* sp.	umbo fragment
Test Unit 2, Level 12	2	*Leptodea fragilis*	nearly complete valves
Test Unit 2, Level 13	1	unidentified	umbo fragment
Test Unit 2, Level 14	1	*Potamilus* sp.	umbo fragment
Test Unit 2, Level 14	1	unidentified	umbo fragment
Test Unit 2, Level 15	21	*Amblema plicata*	umbo fragments
Test Unit 2, Level 15	3	*Tritogonia verrucosa*	umbo fragments
Test Unit 2, Level 15	1	*Leptodea fragilis*	umbo fragment
Test Unit 2, Level 15	17	*Cyrtonaias* sp.	umbo fragments
Test Unit 2, Level 15	18	unidentified	umbo fragments/fragments, too small to ID
Test Unit 2, Level 16	1	*Amblema plicata*	umbo fragment
Test Unit 2, Level 16	1	*Leptodea* sp.	umbo fragment
Test Unit 2, Level 16	1	unidentified	umbo fragment, too eroded to ID
Test Unit 2, Level 17	12	*Amblema plicata*	umbo fragments
Test Unit 2, Level 17	2	*Quadrula* sp.	umbo fragments
Test Unit 2, Level 17	8	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 2, Level 18	73	*Amblema plicata*	umbo fragments
Test Unit 2, Level 18	6	*Tritogonia verrucosa*	umbo fragments
Test Unit 2, Level 18	4	*Quadrula apiculata*	umbo fragments
Test Unit 2, Level 18	12	*Quadrula* sp.	umbo fragments
Test Unit 2, Level 18	4	*Quadrula petrina*	umbo fragments
Test Unit 2, Level 18	1	*Leptodea fragilis*	umbo fragment
Test Unit 2, Level 18	58	unidentified	umbo fragments/fragments, too small/eroded to ID
Test Unit 2, Level 19	2	*Quadrula* sp.	umbo fragments
Test Unit 2, Level 19	2	*Quadrula apiculata*	umbo fragments
Test Unit 2, Level 19	5	*Amblema plicata*	umbo fragments
Test Unit 2, Level 19	4	unidentified	umbo fragments
Test Unit 2, Level 20	11	*Amblema plicata*	umbo fragments
Test Unit 2, Level 20	3	*Tritogonia verrucosa*	umbo fragments
Test Unit 2, Level 20	1	*Quadrula* sp.	umbo fragment
Test Unit 2, Level 20	1	*Leptodea fragilis*	umbo fragment
Test Unit 2, Level 20	10	unidentified	umbo fragments, too eroded to ID
Test Unit 2, Level 21	1	*Amblema plicata*	umbo fragment
Test Unit 2, Level 21	2	*Quadrula* sp.	umbo fragments
Test Unit 2, Level 21	1	unidentified	umbo fragment, too eroded to ID
Test Unit 3, Level 5	4	unidentified	umbo fragments/fragments
Test Unit 3, Level 6	1	*Amblema plicata*	umbo fragment
Test Unit 3, Level 9	1	*Quadrula petrina*	umbo fragment
Test Unit 3, Level 9	1	*Cyrtonaias* sp.	umbo fragment
Test Unit 3, Level 9	3	unidentified	umbo fragments, too eroded to ID
Test Unit 3, Level 10	1	*Amblema plicata*	umbo fragment
Test Unit 3, Level 10	1	unidentified	umbo fragment/fragment, too small to ID
Test Unit 3, Level 11	3	unidentified	umbo fragments, too eroded to ID
Test Unit 3, Level 12	1	*Amblema plicata*	umbo fragment
Test Unit 3, Level 13	2	*Amblema plicata*	umbo fragments
Test Unit 3, Level 13	2	unidentified	umbo fragments, too eroded to ID
Test Unit 3, Level 14	1	*Amblema plicata*	umbo fragment
Test Unit 3, Level 14	2	unidentified	umbo fragments, too eroded to ID
Test Unit 3, Level 15	1	*Leptodea fragilis*	umbo fragment
Test Unit 3, Level 15	3	*Amblema plicata*	umbo fragments
Test Unit 3, Level 15	6	unidentified	umbo fragments, too eroded to ID
Test Unit 3, Level 16	6	*Amblema plicata*	umbo fragments
Test Unit 3, Level 16	10	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 3, Level 17	4	*Amblema plicata*	umbo fragments
Test Unit 3, Level 17	3	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 18	3	*Quadrula petrina*	umbo fragments

Table 18, continued

Provenience	Quantity	Taxon	Description
Test Unit 4, Level 18	3	*Quadrula apiculata*	umbo fragments
Test Unit 4, Level 18	5	*Amblema plicata*	umbo fragments
Test Unit 4, Level 18	3	*Leptodea fragilis*	umbo fragment, nearly complete valves
Test Unit 4, Level 18	13	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 3, Level 19	1	*Leptodea fragilis*	umbo fragment
Test Unit 3, Level 19	2	*Amblema plicata*	umbo fragments
Test Unit 3, Level 19	2	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 1	1	*Amblema plicata*	umbo fragment
Test Unit 4, Level 4	1	unidentified	umbo fragment/fragments
Test Unit 4, Level 6	1	unidentified	umbo fragment/fragments, too small to ID
Test Unit 4, Level 7	1	unidentified	umbo fragment
Test Unit 4, Level 8	1	*Amblema plicata*	umbo fragment
Test Unit 4, Level 9	2	*Amblema plicata*	umbo fragments
Test Unit 4, Level 9	1	unidentified	umbo fragment/fragment, too small to ID
Test Unit 4, Level 10	1	*Amblema plicata*	umbo fragment
Test Unit 4, Level 10	2	unidentified	umbo fragments/fragments
Test Unit 4, Level 11	3	unidentified	umbo fragments/fragments
Test Unit 4, Level 12	1	unidentified	umbo fragment/fragments
Test Unit 4, Level 13	3	*Amblema plicata*	umbo fragments
Test Unit 4, Level 13	2	unidentified	umbo fragments, too eroded to ID
Test Unit 4, Level 14	8	unidentified	umbo fragments, too eroded to ID
Test Unit 4, Level 15	3	*Amblema plicata*	umbo fragments, nearly complete valve
Test Unit 4, Level 15	2	*Leptodea fragilis*	umbo fragment, nearly complete valve
Test Unit 4, Level 15	1	*Quadrula petrina*	umbo fragment
Test Unit 4, Level 15	1	*Quadrula apiculata*	umbo fragment
Test Unit 4, Level 15	1	*Tritogonia verrucosa*	umbo fragment
Test Unit 4, Level 15	6	unidentified	umbo fragments/fragments
Test Unit 4, Level 16	3	*Amblema plicata*	umbo fragments
Test Unit 4, Level 16	1	*Quadrula petrina*	umbo fragment
Test Unit 4, Level 16	1	*Quadrula apiculata*	umbo fragment
Test Unit 4, Level 16	6	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 4, Level 17	1	*Leptodea fragilis*	nearly complete valve
Test Unit 4, Level 17	1	*Quadrula* sp.	nearly complete valve
Test Unit 4, Level 17	4	unidentified	umbo fragments, too eroded to ID
Test Unit 4, Level 18	3	*Amblema plicata*	umbo fragments
Test Unit 4, Level 18	1	*Leptodea fragilis*	nearly complete valve
Test Unit 4, Level 18	1	*Quadrula* sp.	umbo fragment
Test Unit 4, Level 18	7	unidentified	umbo fragments/fragments, too eroded to ID
Test Unit 1, Feature 1, Level 19, flotation sample	8	unidentified	umbo fragments/fragments, too eroded to ID

including rock and hard mud or silty soft bottoms. Found in medium to large rivers, it is common in both shallow and deeper waters at depths ranging from several centimeters to several meters (Howells et al. 1996:136–137; Parmalee 1967:43–44).

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APPENDIX C: VERTEBRATE FAUNAL ANALYSIS

Brian S. Shaffer

Vertebrate faunal remains recovered were analyzed to identify the taxa present and discern taphonomic processes that had impacted the assemblages (Tables 19–21). Identifications were made to the most specific taxon possible given the condition of the assemblage and analyst skill. Remains were tabulated by simple bone counts.

Taphonomic processes addressed include weathering, breakage, burning, chemical dissolution, rodent gnawing, and cut marks. In terms of surface exposure (weathering) that typically results in bleaching, fine-line cracking, and flaking in planes of the surface of the bone, the assemblages are in good shape. Chemical etching produced by roots or matrix acidity can result in dendritic patterns on the surface of the bone (root etching), or pitting over the entire surface (extensive root etching and matrix acidity). Specimens from 41ML160, 41ML179, and 41ML195 exhibit significant chemical dissolution affecting all specimens from those sites.

Breakage was addressed by recording specimens as unbroken, angular fractures, and spiral fractures. Only a few specimens are unbroken. Most of the breakage is the result of angular fractures. Angular fractures typically occur in flat bones of the skeleton such as on portions of the scapulae and ribs, and also on the cranium and pelvis. In long bones and other elements with thick cortical bone, angular fractures typically occur after the specimen has lost its collagen or become "dry." This can result from the processes of cooking that leach collagen from the bone, burning, weathering, and degradation over time. Spiral fractures occur in long bones and other elements with thick cortical bone while the bone still contains collagen or is "fresh." "Fresh" is a relative term since bone may remain fresh for an extended amount of time given favorable conditions of preservation. Spiral fractures of fresh bone may occur during the processing of carcasses for their meat, through the intentional breakage of the bone to gain access to the marrow, or through breaking of the bone into small pieces to process for grease. Processing of bone for marrow or grease may be evidenced by the presence of impact points. Five specimens from 41ML160 and 41ML162 exhibit impact points. Impact points are where the bone suffered an impact from an object that fractured the bone. Impact points are characterized by a cone of percussion and concentric fractures around the point of impact.

Burning was recorded as unburned, charred, and calcined. Charred bone is bone that has been incompletely combusted and may be black or brown in color. Calcined bone is more completely combusted bone that has turned white (sometimes blue as well, but none are noted in this analysis). Combustion beyond calcination results in complete destruction of the bone.

Another taphonomic result observed is the presence of rodent gnawing. Rodent gnawing is evidenced by the closely spaced parallel groove marks produced on the bone's surface by rodent teeth. These marks are differentiated from carnivore gnawing that typically does not produce parallel grooves. Rodent gnawing is differentiated from cut marks by the typical "U" shape of the grooves as compared to the "V" shape of cut marks. Five specimens from 41ML162 exhibit rodent gnawing.

Nine specimens from 41ML140 and 41ML179 have cut marks. All were identified as chop marks. With one exception, all of the chop marks completely transect the bone. Where discernible, the cut marks were made with a smooth-bladed implement such as a cleaver.

Table 19. Summary of vertebrate faunal remains

Site	Taxon	Totals
41ML135	Mammalia (Canid/deer-sized)	4
41ML140	Vertebrata (Vertebrates)	24
	Bufo sp. (Toads)	1
	Aves (Duck/turkey-sized)	3
	Mammalia (Canid/deer-sized)	102
	Mammalia (Deer/bison-sized)	24
	Artiodactyla (Goat/deer-sized)	2
	Sus scrofa (Pig)	25
	Bos/Bison (Cow/bison)	1
	Ovis/Capra (Sheep/goat)	1
Subtotal		183
41ML160	Vertebrata (Vertebrates)	11
	Mammalia (Canid/deer-sized)	75
	Artiodactyla (Goat/deer-sized)	7
Subtotal		93
41ML162	Vertebrata (Vertebrates)	46
	Osteichthyes (Medium-sized, >6 inches)	2
	Sciaenidae (Drum)	1
	Testudinata (Turtles)	11
	Mammalia (Rabbit/canid-sized)	1
	Mammalia (Canid/deer-sized)	114
	Mammalia (Large/very large)	26
	Sylvilagus sp. (Cottontail rabbits)	2
	Artiodactyla (Goat/deer-sized)	21
	Artiodactyla (Cow/bison-sized)	3
	Odocoileus sp. (Deer)	2
	Bos/Bison (Cow/bison)	1
Subtotal		230
41ML179	Mammalia (Canid/deer-sized)	5
	Artiodactyla (Goat/deer-sized)	1
Subtotal		6
41ML185	Vertebrata (Vertebrates)	5
	Mammalia (Canid/deer-sized)	17
	Artiodacyla (Goat/deer-sized)	1
Subtotal		23
41ML195	Vertebrata (Vertebrates)	11
	Mammalia (Canid/deer-sized)	3
Subtotal		14
TOTALS		553

Table 20. Vertebrate faunal taphonomy

	Weathering		Breakage			Burning						
Site	Light	Marked	Unbroken	Angular	Spiral	Unburned	Charred	Calcined	Rodent Gnawed	Chemical Etching	Chopped	Impact Fracture
41ML135	4	–	–	–	4	4	–	–	–	–	–	–
41ML140	182	1	6	143	29	140	16	24	–	–	8	3
41ML160	93	–	–	47	46	81	11	1	–	93	–	2
41ML162	224	2	2	147	77	172	28	26	5	1	–	–
41ML179	5	–	–	5	–	5	–	–	–	5	1	–
41ML185	23	–	1	12	10	20	–	3	–	10	–	–
41ML195	14	–	–	12	2	–	5	–	–	9	–	–

Table 21. Provenience of vertebrate faunal remains

Provenience	Quantity	Taxon	Comments
41ML135			
Test Unit 4, Level 1	4	Mammalia (medium/large)	light weathering, spiral break, unburned
41ML140			
Test Unit 1, Feature 5, Level 2	6	Vertebrata	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 2	2	Aves (large)	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 2	5	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 2	1	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 1, Feature 5, Level 2	2	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 1, Feature 5, Level 2	1	*Sus scrofa*	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 3	3	Vertebrata	light weathering, angular break, calcined
Test Unit 1, Feature 5, Level 3	3	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 4	2	Vertebrata	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 4	1	Mammalia (medium/large)	light weathering, angular break, unburned, 2 chop marks
Test Unit 1, Feature 5, Level 4	1	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 4	2	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 1, Feature 5, Level 4	1	*Sus scrofa*	light weathering, unbroken, unburned
Test Unit 1, Feature 5, Level 5	4	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 1, Feature 5, Level 5	2	Mammalia (medium/large)	light weathering, spiral break, charred
Test Unit 1, Feature 5, Level 5	3	Mammalia (medium/large)	light weathering, spiral break, calcined
Test Unit 1, Feature 5, Level 5	3	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 1, Feature 5, Level 5	8	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 1, Feature 5, Level 5	8	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 5	3	Mammalia (large/very large)	light weathering, spiral break, unburned
Test Unit 1, Feature 5, Level 5	2	Mammalia (large/very large)	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 5	1	Mammalia (large/very large)	light weathering, angular break, unburned, chopped
Test Unit 1, Feature 5, Level 5	1	Artiodactyla (large)	
Test Unit 1, Feature 5, Level 5	1	*Bos/Bison*	light weathering, angular break, unburned
Test Unit 1, Feature 5, Level 6	2	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 1, Feature 5, Level 6	1	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 1, Feature 5, Level 6	8	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 1, Feature 5, Level 6	3	Mammalia (medium/large)	light weathering, spiral break, calcined
Test Unit 1, Feature 5, Level 7	1	Mammalia (large/very large)	light weathering, angular break, unburned, chopped at least 2 times
Test Unit 1, Feature 5, Level 7	1	Artiodactyla (medium)	marked weathering, angular break, calcined
Test Unit 2, Feature 2, Level 1	1	Aves (large)	light weathering, unbroken, unburned
Test Unit 2, Feature 2, Level 2	5	Vertebrata	light weathering, angular break, unburned
Test Unit 2, Feature 2, Level 2	2	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 2, Feature 2, Level 2	5	*Sus scrofa*	light weathering, angular break, unburned

Table 21, continued

Provenience	Quantity	Taxon	Comments
Test Unit 2, Feature 2, Level 2	2	*Sus scrofa*	light weathering, unbroken, unburned
Test Unit 2, Feature 2, Level 3	3	Vertebrata	light weathering, angular break, unburned
Test Unit 2, Feature 2, Level 3	5	*Sus scrofa*	light weathering, angular break, unburned
Test Unit 2, Feature 2, Level 3	2	*Sus scrofa*	light weathering, unbroken, unburned
Test Unit 3, Feature 3, Level 1	1	Vertebrata	light weathering, spiral break, unburned
Test Unit 3, Feature 3, Level 2	3	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 3, Feature 3, Level 2	1	Mammalia (large/very large)	light weathering, spiral break, unburned
Test Unit 3, Feature 3, Level 2	2	*Sus scrofa*	light weathering, angular break, unburned
Test Unit 3, Feature 3, Level 3	2	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 5, Feature 6, Level 2	3	Vertebrata	light weathering, angular break, charred
Test Unit 5, Feature 6, Level 2	2	Mammalia (medium/large)	light weathering, spiral break, charred
Test Unit 6, Feature 5, Level 2	1	*Bufo* sp.	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 2	1	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 6, Feature 5, Level 3	1	Vertebrata	light weathering, spiral break, unburned
Test Unit 6, Feature 5, Level 3	1	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 6, Feature 5, Level 3	8	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 3	4	*Sus scrofa*	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 4	1	Mammalia (medium/large)	light weathering, angular break, unburned, chopped
Test Unit 6, Feature 5, Level 4	3	*Sus scrofa*	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 5	1	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 6, Feature 5, Level 5	10	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 5	3	Mammalia (large/very large)	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 5	1	Mammalia (large/very large)	light weathering, angular break, unburned, chopped
Test Unit 6, Feature 5, Level 5	3	Mammalia (large/very large)	light weathering, spiral break, unburned
Test Unit 6, Feature 5, Level 5	1	Ovis/Capra	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 6	11	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 6	1	Mammalia (medium/large)	light weathering, angular break, unburned, chopped
Test Unit 6, Feature 5, Level 6	2	Mammalia (large/very large)	light weathering, angular break, unburned, chopped
Test Unit 6, Feature 5, Level 6	1	Mammalia (large/very large)	light weathering, spiral break, charred
Test Unit 6, Feature 5, Level 6	6	Mammalia (large/very large)	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 7	1	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 6, Feature 5, Level 7	1	Mammalia (medium/large)	light weathering, angular break, calcined
41ML160			
Test Unit 3, Feature 1, Level 18	3	Mammalia (medium/large)	light weathering, spiral break, unburned, marked chemical etching
Test Unit 3, Feature 1, Level 18	2	Mammalia (medium/large)	light weathering, spiral break, charred, marked chemical etching
Test Unit 3, Feature 1, Level 18	1	Artiodactyla (medium)	light weathering, angular break, unburned, marked chemical etching, deer-sized
Test Unit 3, Level 18	7	Vertebrata	light weathering, angular break, unburned, marked chemical etching
Test Unit 3, Level 18	1	Vertebrata	light weathering, angular break, calcined

Table 21, continued

Provenience	Quantity	Taxon	Comments
Test Unit 3, Level 18	8	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 3, Level 18	2	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 3, Level 18	6	Mammalia (medium/large)	light weathering, spiral break, charred
Test Unit 3, Level 18	6	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 3, Level 18	1	Artiodactyla (medium)	light weathering, spiral break, charred, marked chemical etching
Test Unit 3, Level 18	1	Artiodactyla (medium)	light weathering, spiral break, unburned, marked chemical etching
Test Unit 3, Level 18	1	Artiodactyla (medium)	light weathering, spiral break, unburned, marked chemical ethcing, impact fracture
Test Unit 4, Level 18	3	Vertebrata	light weathering, angular break, unburned, marked chemical etching
Test Unit 4, Level 18	26	Mammalia (medium/large)	light weathering, angular break, unburned, marked chemical etching
Test Unit 4, Level 18	22	Mammalia (medium/large)	light weathering, spiral break, unburned, marked chemical etching
Test Unit 4, Level 18	2	Artiodactyla (medium)	light weathering, spiral break, unburned, marked chemical etching, impact fracture
Test Unit 4, Level 18	1	Artiodactyla (medium)	light weathering, angular break, unburned, marked chemical etching
41ML162			
Test Unit 1, Level 4	1	Artiodactyla (medium)	light weathering, angular break, unburned
Test Unit 1, Level 7	12	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 1, Level 7	5	Mammalia (large/very large)	light weathering, angular break, unburned
Test Unit 1, Level 7	1	Mammalia (large/very large)	light weathering, angular break, unburned
Test Unit 1, Level 10	1	Testudinata	light weathering, angular break, unburned
Test Unit 1, Level 11	1	Vertebrata	light weathering, angular break, calcined
Test Unit 1, Level 12	1	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 1, Level 13	1	Artiodactyla (medium)	light weathering, spiral break, unburned, rodent gnawed
Test Unit 2, Level 3	1	Mammalia (medium/large)	light weathering, spiral break, calcined
Test Unit 2, Level 3	12	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 2, Level 3	4	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 2, Level 3	6	Mammalia (large/very large)	light weathering, spiral break, unburned
Test Unit 2, Level 3	1	*Sylvilagus* sp.	light weathering, angular break, unburned
Test Unit 2, Level 3	2	Artiodactyla (large)	light weathering, spiral break, unburned
Test Unit 2, Level 3	1	Artiodactyla (large)	light weathering, angular break, unburned, rodent gnawed
Test Unit 2, Level 4	15	Vertebrata	light weathering, angular break, unburned
Test Unit 2, Level 4	3	Testudinata	light weathering, angular break, unburned
Test Unit 2, Level 4	6	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 2, Level 4	3	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 2, Level 4	1	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 2, Level 4	12	Mammalia (large/very large)	light weathering, spiral break, unburned
Test Unit 2, Level 4	1	Artiodactyla (medium)	light weathering, angular break, unburned
Test Unit 2, Level 4	1	*Bos*/*Bison*	marked weathering, spiral break, unburned
Test Unit 2, Level 5	2	Osteichthyes (medium)	light weathering, angular break, unburned

Table 21, continued

Provenience	Quantity	Taxon	Comments
Test Unit 2, Level 5	1	Sciaenidae	light weathering, angular break, unburned
Test Unit 2, Level 5	6	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 2, Level 5	7	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 2, Level 5	2	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 2, Level 5	1	Artiodactyla (medium)	light weathering, spiral break, unburned, impact fracture
Test Unit 2, Level 5	4	Testudinata	
Test Unit 2, Level 6	1	Vertebrata	light weathering, angular break, unburned
Test Unit 3, Level 3	2	Vertebrata	light weathering, angular break, charred
Test Unit 3, Level 3	1	Testudinata	light weathering, angular break, unburned
Test Unit 3, Level 3	1	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 3, Level 3	1	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 3, Level 3	1	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 3, Level 3	1	Artiodactyla (medium)	marked weathering, spiral break, unburned
Test Unit 3, Level 4	2	Vertebrata	light weathering, angular break, unburned
Test Unit 3, Level 4	1	Vertebrata	light weathering, angular break, calcined
Test Unit 3, Level 4	2	Mammalia (medium/large)	light weathering, spiral break, unburned, rodent gnawed
Test Unit 3, Level 4	1	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 3, Level 4	1	Mammalia (large/very large)	light weathering, spiral break, unburned
Test Unit 3, Level 4	1	*Odocoileus* sp.	light weathering, unbroken, unburned
Test Unit 3, Feature 1, Level 5	4	Vertebrata	light weathering, angular break, charred
Test Unit 3, Feature 1, Level 5	1	Mammalia (Small/medium)	light weathering, angular break, unburned
Test Unit 3, Feature 1, Level 5	2	Mammalia (medium/large)	light weathering, spiral break, calcined
Test Unit 3, Feature 1, Level 5	2	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 3, Feature 1, Level 5	2	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 3, Feature 1, Level 5	1	Artiodactyla (medium)	light weathering, angular break, calcined
Test Unit 3, Feature 1, Level 5	1	Artiodactyla (medium)	light weathering, angular break, unburned
Test Unit 3, Feature 1, Level 6	5	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 3, Feature 1, Level 6	1	Artiodactyla (medium)	light weathering, unbroken, unburned
Test Unit 3, Feature 1, Level 6	1	Artiodactyla (medium)	light weathering, spiral break, unburned
Test Unit 3, Feature 1, Level 6	1	Artiodactyla (medium)	light weathering, spiral break, unburned, impact fracture
Test Unit 3, Feature 1, Level 6	2	Artiodactyla (medium)	light weathering, angular break, unburned
Test Unit 3, Feature 1, Level 7	2	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 3, Feature 1, Level 7	2	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 3, Feature 1, Level 7	1	*Sylvilagus* sp.	light weathering, angular break, unburned
Test Unit 3, Feature 1, Level 7	3	Artiodactyla (medium)	light weathering, spiral break, unburned
Test Unit 3, Feature 1, Level 8	1	Vertebrata	light weathering, angular break, unburned
Test Unit 3, Feature 1, Level 8	3	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 3, Feature 1, Level 9	1	Vertebrata	light weathering, angular break, calcined
Test Unit 3, Feature 1, Level 9	1	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 4, Level 4	3	Vertebrata	light weathering, angular break, charred

Table 21, continued

Provenience	Quantity	Taxon	Comments
Test Unit 4, Level 4	3	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 4, Level 5	3	Vertebrata	light weathering, angular break, unburned
Test Unit 4, Level 5	8	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 4, Level 5	2	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 4, Level 6	2	Vertebrata	light weathering, angular break, calcined
Test Unit 4, Level 6	1	Vertebrata	light weathering, angular break, unburned
Test Unit 4, Level 6	1	Artiodactyla (medium)	light weathering, angular break, unburned
Test Unit 4, Level 7	1	Vertebrata	light weathering, angular break, unburned
Test Unit 4, Level 7	1	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 4, Level 7	1	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 4, Level 7	1	*Odocoileus* sp.	light weathering, spiral break, unburned
Test Unit 4, Level 10	1	Vertebrata	light weathering, angular break, calcined
Test Unit 4, Level 10	2	Vertebrata	light weathering, angular break, charred
Test Unit 4, Level 12	1	Mammalia (large/very large)	light weathering, angular break, unburned, root etched
Test Unit 4, Level 14	4	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 4, Level 14	6	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 4, Level 14	1	Artiodactyla (medium)	light weathering, spiral break, unburned, rodent gnawed
Test Unit 4, Level 14	1	Artiodactyla (medium)	light weathering, spiral break, unburned
Test Unit 4, Level 16	1	Mammalia (medium/large)	light weathering, spiral break, charred
Test Unit 4, Level 16	1	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 4, Level 16	1	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 4, Level 17	1	Mammalia (medium/large)	light weathering, angular break, charred
Test Unit 4, Level 17	1	Mammalia (medium/large)	light weathering, spiral break, unburned
Test Unit 4, Level 18	4	Vertebrata	light weathering, angular break, unburned
Test Unit 4, Level 18	2	Testudinata	light weathering, angular break, unburned
Test Unit 5, Level 4	1	Vertebrata	light weathering, angular break, unburned
Test Unit 5, Level 4	1	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 5, Level 5	1	Artiodactyla (medium)	light weathering, angular break, unburned
Test Unit 5, Level 5	1	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 5, Level 6	1	Artiodactyla (medium)	light weathering, spiral break, unburned
Test Unit 5, Level 7	1	Artiodactyla (medium)	light weathering, angular break, charred
Test Unit 5, Level 9	1	Mammalia (medium/large)	light weathering, spiral break, unburned, greasy
Test Unit 5, Level 9	1	Mammalia (medium/large)	light weathering, angular break, unburned
41ML179			
Test Unit 1, Feature 1, Level 4	1	Mammalia (medium/large)	light weathering, angular break, unburned, chopped, marked chemcial etching
Test Unit 1, Feature 1, Level 4	1	Artiodactyla (medium)	light weathering, angular break, unburned, marked chemical etching
Test Unit 1, Feature 1, Level 5	3	Mammalia (medium/large)	light weathering, angular break, unburned, marked chemical etching
Test Unit 1, Feature 1, Level 6	1	Mammalia (medium/large)	

Table 21, continued

Provenience	Quantity	Taxon	Comments
41ML185			
Test Unit 2, Level 11	3	Mammalia (medium/large)	light weathering, angular break, calcined
Test Unit 1, Level 9	3	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 1, Level 11	1	Mammalia (medium/large)	light weathering, angular break, unburned
Test Unit 1, Level 15	3	Vertebrata	light weathering, angular break, unburned
Test Unit 1, Level 15	10	Mammalia (medium/large)	light weathering, spiral break, unburned, marked chemical etching
Test Unit 3, Level 3	1	Vertebrata	light weathering, angular break, unburned
Test Unit 3, Level 5	1	Vertebrata	light weathering, angular break, unburned
Test Unit 5, Level 4	1	Artiodactyla (medium)	light weathering, unbroken, unburned
41ML195			
Test Unit 1, Level 19	1	Mammalia (medium/large)	light weathering, angular break, unburned, marked chemical etching
Test Unit 2, Level 18	2	Vertebrata	light weathering, spiral break, unburned, marked chemical etching
Test Unit 2, Level 18	1	Mammalia (medium/large)	light weathering, angular break, unburned, marked chemical etching
Test Unit 2, Level 18	1	Mammalia (medium/large)	light weathering, angular break, charred, marked chemical etching
Test Unit 1, Feature 1, Level 19	4	Vertebrata	light weathering, angular break, charred, marked chemical etching
Test Unit 1, Feature 1, Level 19	5	Vertebrata	light weathering, angular break, unburned

APPENDIX D: SUMMARY OF RADIOCARBON DATES

Table 22. Summary of radiocarbon dates

Sample	Material	Provenience	Feature	Conventional ^{14}C Age B.P. (δ^{13}C)	Two-Sigma Calibrated Age Range and Intercept(s)**
Beta–154279*	charcoal	41ML162, Test Unit 3, Level 6 (50–60 cm)	1	1980 ± 60 (–24.1‰)	2060 (1920) 1820 B.P.
Beta–154280*	charcoal	41ML162, Test Unit 4, Level 7 (69 cm)	2	2830 ± 40 (–26.5‰)	3050 (2940) 2850 B.P.
Beta–154281*	charcoal	41ML162, Test Unit 4, Level 8 (72 cm)	2	2780 ± 40 (–25.3‰)	2960 (2870) 2780 B.P.
Beta–154282*	charcoal	41ML162, Test Unit 4, Level 12 (110–120 cm)	–	3600 ± 40 (–25.5‰)	3990 (3900) 3830 B.P.
Beta–154283*	charcoal	41ML162, Test Unit 1, Level 12 (112 cm)	–	2210 ± 40 (–22.8‰)	2330 (2300, 2250, 2170) 2120 B.P.
Beta–154285*	charcoal	41ML185, Test Unit 5, Level 8 (160–170 cm)	–	117.5 ± 0.6 (–27.0‰)	modern date
Beta–154286*	charcoal	41ML185, Test Unit 4, Level 4 (120–130 cm)	–	160 ± 50 (–29.3‰)	300 (270, 200, 150, 20, 0) 0 B.P.
Beta–154287*	bulk soil/ charcoal	41ML195, Test Unit 1, Level 19 (259 cm)	1	3130 ± 40 (–25.0‰)	3440 (3360) 3260 B.P.
Beta–154288*	charcoal	41ML195, Test Unit 2, Level 19 (265 cm)	–	2870 ± 40 (–25.0‰)	3090 (2970) 2870 B.P.
Beta–154289*	charcoal	41ML195, Test Unit 4, Level 19 (265–275 cm)	–	2790 ± 40 (–24.6‰)	2970 (2870) 2780 B.P.
Beta–154290*	charcoal	41ML195, Test Unit 2, Level 18 (245–255 cm)	–	2740 ± 40 (–25.0‰)	2920 (2840) 2760 B.P.
Beta–154291*	charcoal	41ML162, Test Unit 5, Level 8 (72 cm)	–	810 ± 40 (–25.5‰)	780 (710) 670 B.P.
Beta–154292*	charcoal	41ML162, Test Unit 4, Level 13 (127 cm)	–	3490 ± 40 (–24.2‰)	3860 (3720) 3650 B.P.
Beta–154293	bulk soil	41ML162, Trench 4, Ab horizon (50–60 cm)	–	1720 ± 60 (–23.3‰)	1800 (1610) 1520 B.P.
Beta–154294	bulk soil	41ML162, Trench 4, 2Ab horizon (107–117 cm)	–	3400 ± 70 (–22.0‰)	3840 (3640) 3470 B.P.
Beta–154295	bulk soil	41ML185, Trench 2, Ab horizon (101–109 cm)	–	1130 ± 80 (–16.4‰)	1250 (1050) 920 B.P.
Beta–154296	bulk soil	41ML194, Trench 6, 2Ab horizon (114–122 cm)	–	1070 ± 80 (–16.3‰)	1170 (960) 790 B.P.

* AMS radiocarbon dates

** Calibration database used:

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