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An Archeological Survey, Initial Site Testing and Geomorphic Study of Ditches 7, 13 and Lower Buffalo Creek in Craighead, Mississippi and Poinsett Counties, Arkansas

by
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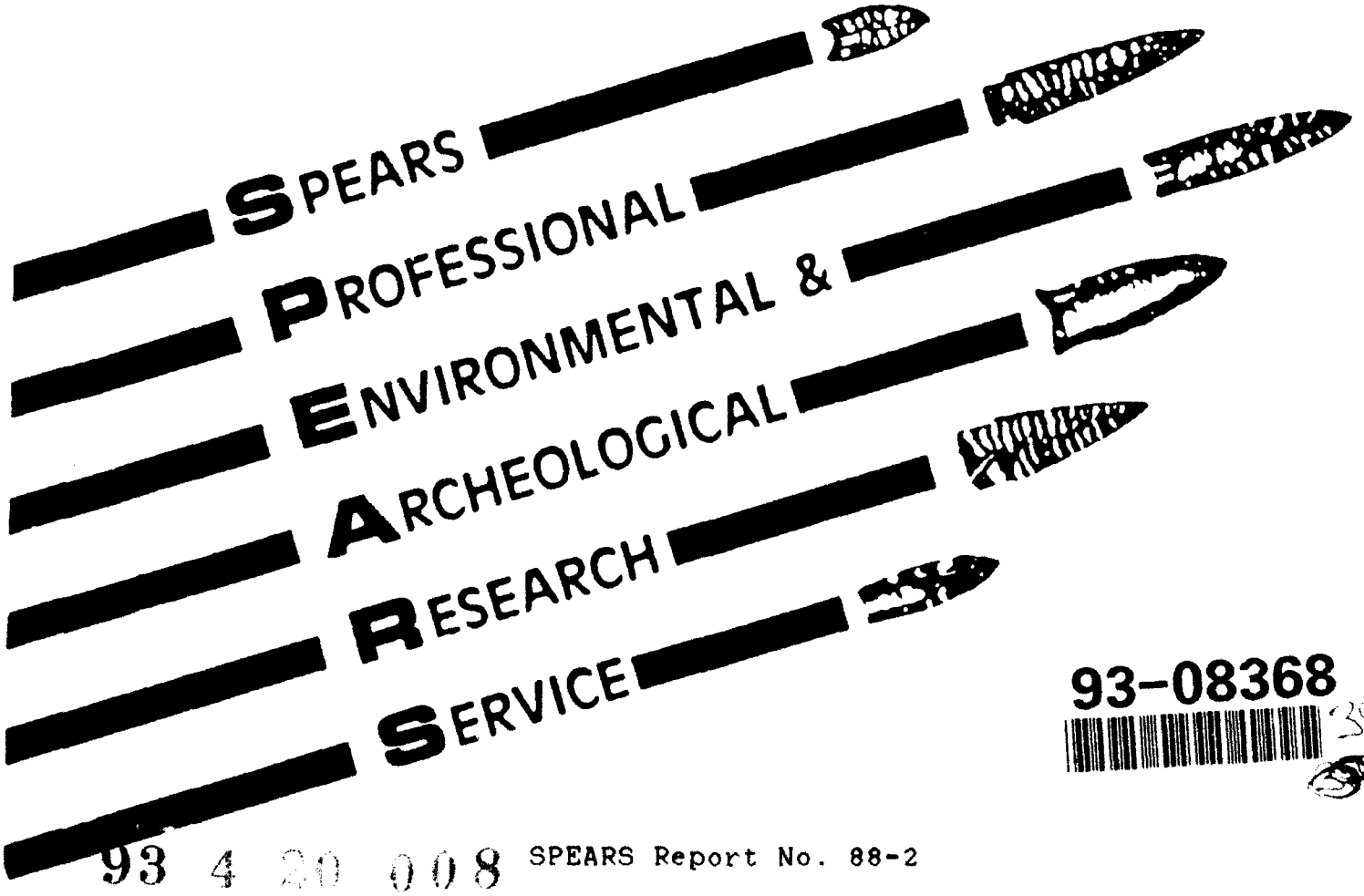

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FINAL REPORT

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Report prepared by

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ABSTRACT

An archeological survey of about 67 miles along Ditches 7, 13, and Buffalo Creek Ditch was performed by Spears Professional Environmental and Archeological Research Service (SPEARS) for the U. S. Army Corps of Engineers, Memphis District (Contract No. DACW 66-86-C-0072). The majority of the archeological survey and initial site testing was conducted by 2 field directors, 1 supervisor and 2 crew members over a period of 27 days between July 22 and August 30, 1986. Combinations of survey strategies including pedestrian transects and screened shovel tests at 30 meter intervals were utilized depending on surface visibility. The survey resulted in the identification and recording of 66 new sites and revisits at 4 previously recorded sites. Initial site testing was conducted at over half of these cultural resources.

Sites were found associated with three landforms identified in the project area which include natural levees, the braided stream terrace, and braided stream fill. Sediments from several locations and two backhoe trenches were analyzed for grain size and texture. Deep stratified sites were found on the natural levees. Other prehistoric middens were located in the braided stream channel fills and in sediments deposited on top of the braided terrace. Comparisons are made among Late Woodland Dunklin phase middens found. The earliest sites identified date to the Late Archaic (and possibly earlier) and were found in the western part of the project area.

Ten prehistoric sites and two multi-component prehistoric and historic sites are considered significant and eligible for nomination to the National Register. These sites contain information on the emergence of Mississippian culture in this area. Further testing is required at 6 prehistoric and 1 historic site before significance can be established. Cultural material was found on the spoil at 12 locations where sites are presumed to be buried. Additional work is recommended at these locations to find and evaluate the cultural resources and to determine if the proposed ditch cleaning will adversely affect important cultural strata. The remainder of the sites are isolated finds, redeposited sites, sites with deposits confined to the plowzone, or are house sites or trash areas which date to the twentieth century. These cultural resources are not considered significant and no further work is recommended. Several sites lie outside the project area and were not evaluated for significance.

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Chapter 1

INTRODUCTION TO THE DITCHES 7, 13 AND LOWER BUFFALO CREEK DITCH PROJECT

by

Carol S. Spears

INTRODUCTION

The U. S. Army Corps of Engineers, Memphis District, contracted with Spears Professional Environmental and Archeological Research Service (SPEARS) for a "Cultural resources background and literature search, an intensive survey investigation, a geomorphic study, and initial site testing along Ditches 7 and 13, and Lower Buffalo Creek in Craighead, Mississippi and Poinsett Counties, Arkansas" (Contract No. DACW66-86-C-0072). Proposed channel construction is located on the west side of Big Lake just north of Manila, and includes land west and southwest to Rivervale which lies just east of the St. Francis Sunken Lands (Figure 1). The survey corridor extends 200 feet on each side of the existing ditches and 350 feet out from the Little River Floodway levee and includes 67 linear miles.

The purposes of the project were to locate, identify, evaluate and record all cultural resources within the project corridor. Specific engineering plans for the construction, alteration, or cleanout of these ditches have not been designed in order that the cultural resources could be considered in the early planning processes. Attempts will be made to avoid significant sites or to mitigate the adverse effects. The archeological survey of this project area consisted of systematically walking the corridor when surface visibility was 10% or better. When visibility was lower, screened shovel tests on transects were excavated at 30 m intervals. Initial site testing consisted of conducting either controlled surface collections or mapping individual artifacts and excavating subsurface units. Initial site testing was accomplished at all sites found unless landowner permission was not obtained or the sites were obviously not eligible for nomination to the National Register. Backhoe trenches and bank profiles to locate buried sites were beyond the scope of this project. Portions of the Scope of Work are presented in Appendix F.

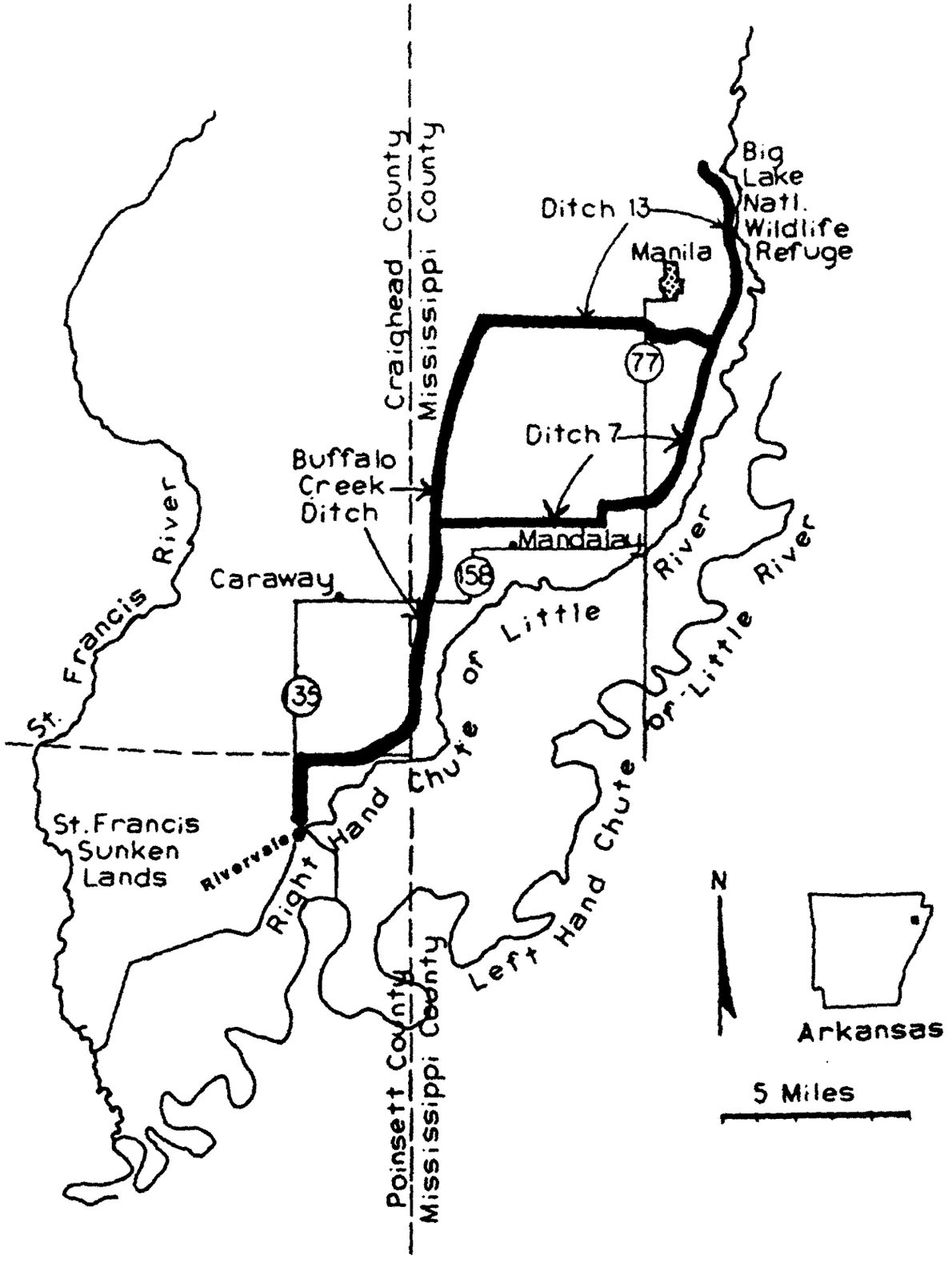


Figure 1. Location of the Project Area.

The geomorphic study was undertaken in order to examine the potential for buried sites within the project area and to collect information on the age and nature of sediments. The contract allowed for palynological samples in order to obtain data useful in the interpretation of the paleoenvironment. Geomorphic fieldwork included the collection of sediment samples at six archeological sites and backhoe trenches in two old meander scars. Samples were subjected to pollen and sediment texture analyses.

RESULTS

Prior to submitting the price proposal and the subsequent fieldwork, the number of sites likely to be found in the project area was estimated. It was calculated that at least 20% of these would be subjected to limited testing. Predictions were based solely on soil types, which were used as indicators of landscape origin and topography. By estimating high, medium, and low probability soils and multiplying these by site density estimates derived from other archeological surveys in the vicinity, it was predicted that 70.5 archeological sites would be found in the project.

The majority of the archeological survey and initial site testing was conducted by 2 field directors, 1 supervisor, and 2 crewmembers over a period of 27 days between July 22 and August 30, 1986. The preliminary background research, including a records search at the Office of the State Archeologist and a review of Government Land Office surveys, was completed prior to the fieldwork. The management summary was submitted within 10 days after completion of the fieldwork. Additional visits to the project area were made by 6 persons on December 4, 1986, and by the two field directors from February 11-17, 1987. Controlled surface collections, site mapping, and subsurface testing were accomplished where landowner permission was obtained. An updated synopsis of this work was submitted to the Corps of Engineers archeologist after returning from the field. The draft report was written over a period of several months. Completion of the entire draft was delayed due to the lengthy time required to synthesize the data and to conduct the geomorphic study which included the pollen and soil texture analyses.

The survey resulted in recording 66 new sites and investigations at 4 previously recorded sites. In this report, these sites have been divided into six sections: (1) Prehistoric Sites Recommended for Testing, (2) Buried Sites Recommended for Testing, (3) Isolated Finds, (4) Redeposited and Plowzone Sites, (5) Sites Located Outside the Project Area, and (6) Historic Sites and Artifacts. Eighteen prehistoric sites were found which contained intact deposits or middens. These sites are significant and eligible for nomination to the National Register. If these sites cannot be avoided by the proposed project, then additional testing and mitigation is recommended. Twelve prehistoric sites are buried and require further investigations

including deep subsurface tests and bank profiles in order to find and evaluate the deposits and determine the effects of the proposed project. Fifteen sites are isolated finds and 6 sites are redeposited or have cultural material confined to the plowzone. Ten sites are located almost entirely outside the project corridor. Limited testing was conducted within the proposed project corridor. Results of this testing verified the lack of intact and/or potentially significant deposits within the right of way. Nine sites are historic and 7 sites are both prehistoric and historic. Two historic sites are significant in terms of National Register Criteria and one historic site is potentially eligible.

PROJECT CONSTRAINTS

The project fieldwork was constrained by high summer temperatures which necessitated the field crews resorting to a shorter work day when the heat index was well over 100 degrees F. At the beginning of the survey, the area had suffered from droughts and crops were on the average small and sparse allowing good surface visibility. About halfway through the field work, precipitation and/or irrigation increased and crop growth improved significantly. Visibility during the latter part of the survey decreased and during initial site testing visibility was so poor that controlled surface collections could not be performed. In addition, a few landowners disallowed subsurface tests of any kind until crops were harvested. Due to a slowed harvest, several sites could not be tested. Again toward the end of the project, initial site testing was hampered by extremely dry and compact sediments at several locations. When the ceramics were softer than the surrounding matrix and sediment colors even when sprayed were indistinguishable, testing was considered detrimental to understanding the cultural resources. For this reason, testing was postponed at two sites until winter. In December and then in February 1987, several sites were revisited and mapped, and limited subsurface testing was conducted. Landowners were still reluctant to allow subsurface tests.

Although the actual number of sites to be found was accurately predicted, the estimate (20%) for the number of sites to be tested was entirely too low. Subsequent initial site testing and detailed mapping was conducted at over 50% of the sites found. In addition, several of the sites were large and artifacts were dense and/or widely dispersed. Other sites were deep, stratified, and contained intact middens, features, and a high density of artifacts. This immense amount of data had to be synthesized and summarized. All of these factors meant that the budget was stretched beyond its limits. For this reason this report is primarily descriptive. The data on these sites could lend itself to several topics of research in the future.

PREVIOUS RESEARCH WITHIN THE PROJECT AREA

The only previously recorded sites in the project area are 3MS41, 3MS43, 3MS93, 3MS211, and 3MS212. 3MS41 is a Woodland and Mississippian village which was recorded and collected by amateurs. Skeletons were allegedly taken from this site in the 1920s. 3MS43 was also reported by amateur archeologists. It was determined during SPEARS fieldwork to be outside the present project area. 3MS93 was first reported in 1973 when limited investigations were conducted at the site by the Arkansas Archeological Survey who recommended further testing at the site. This testing was never conducted yet subsequent ditch construction had an adverse impact on the site. Again in 1975, a portion of the site was bulldozed and used in a nearby bridge construction. In 1979 Iroquois Research Institute investigated the site as part of the Ditch 81 project (Iroquois Research Institute 1980a). Their work resulted in delineating surface boundaries and identifying several subsurface features. A determination of eligibility was requested for 3MS93 at that time. 3MS211 and 3MS212 were recorded on the General Land Office Surveys (GLO's) plots drawn by B.F. Owen in December of 1846. Each was the location of a field and possible house. Historic artifacts possibly related to the 3MS211 plot were identified in this study; however, no evidence of 3MS212 was found inside the corridor. Additional information on the nature of the previously recorded site is presented with the appropriate site description in this report.

The only archeological projects conducted in the vicinity of the project or directly adjacent to the project area include: (1) the recent study north of this project on Ditches 29, 10, and 11 by Mid-Continental Research Associates (Lafferty et al. 1987); (2) the work conducted by Iroquois Research Institute, Inc. on Ditch 81, which describes investigations at 3MS93 (Iroquois Research Institute 1980a), Buffalo Creek Diversion Project (Iroquois Research Institute 1978), Honey Cypress Ditch (Iroquois Research Institute 1979), and Upper Buffalo Creek Ditch (Iroquois Research Institute 1980b); (3) the survey and testing of sites within a corridor from Keo to Blytheville (Padgett 1978); and (4) two reports on the Buffalo Creek Project conducted by Soil Systems Inc. (Dicks and Glander 1982a,1982b).

An archeological survey of 35 miles of Ditches 29, 10, and 11, which are located north and east of this study area was conducted by Mid-Continental Research Associates in 1986 (Lafferty et al. 1987). Twenty-six archeological sites were recorded, but 18 of these were recent twentieth century houses or dumps. Four prehistoric sites contained stratified Woodland and Mississippian deposits and were considered significant in terms of National Register criteria. This project included a geomorphic study in which pollen cores and sediments were extracted in an east-west line from the older braided stream terrace to the Mississippi River meanders of Pemiscot Bayou. One core was taken from the area in Big Lake which is west and adjacent to our study area. In the base of this core, sediments

dated to almost 10,000 B.P. and the pollen extracted indicated the presence of open water in this vicinity at that time. The sediments were analyzed for their potential to contain buried archeolgical sites and the pollen was used to reconstruct the paleoenvironment. A slight drying period or hypsithermal was evident, but the climate as observed and interpreted in the samples suggests this climatic change was not as severe as previously hypothesized. A computer generated predictive model was developed. Results substantiated that the terrace deposits or high areas adjacent to the water are the most likely areas to contain prehistoric sites.

The Buffalo Creek Diversion Project (Iroquois Research Institute 1978) was a survey of about 4.2 miles of corridor for a proposed ditch between Buffalo Creek Ditch and Cockle Burr Slough Ditch. During this project 30 sites were found and four of these were considered significant. Recommendations included avoidance, preservation, or data recovery. The prehistoric site 3CG847 contained a high density of cultural material from the surface down to almost 1 meter. The density was highest between 20-50 cm and the artifacts indicated it was a multi-component site dating from the Archaic to the Mississippian periods. By examining the distribution of cultural material as presented in this report, the site has both Late Woodland and Mississippian components which appear to be mixed throughout the unit. However, intrusive cultural or natural features may account for the presence of shell tempered pottery in what seems to be a predominately Barnes midden.

The Honey Cypress Creek Ditch project involved the survey of 22 miles of ditch from Dunklin County, Missouri, to Mississippi County, Arkansas (Iroquois Research Institute 1979). During this project nine sites including three architectural components were found. One of the prehistoric sites was considered eligible for nomination to the National Register because it contained deep stratified deposits dating to the Woodland and Mississippian periods.

The Upper Buffalo Creek Project (Iroquois Research Institute 1980b) involved an intensive survey of about 17 miles of ditch corridor from Senath, Missouri, to Leachville, Arkansas. In this study 21 sites were found. Of these, 15 were prehistoric, 5 were historic, 3 were architectural, and 2 were located outside the project area. The prehistoric components recognized were from the Late Archaic through the Mississippian periods. Two of the sites were found to be potentially eligible for nomination to the National Register. Since design plans for the project had not been finalized, avoidance was recommended. Test units at the two significant sites (3MS373 and 23DU252) were excavated below 1 m and cultural deposits dating from the Late Archaic, Late Woodland, and Mississippian periods were found. Although the number of sites found in this study was low, the highest number found per square mile were on Cairo Silty Clay and Sharkey-Steele

complex soils (Iroquois Research Institute 1980b:78). These types of soils represent the relict gathering channels. Few sites were found on the relict interfluve subdivision (Iroquois Research Institute 1980b:76).

The AP & L Transmission line survey was conducted by the Arkansas Archeological Survey (Padgett 1978). All sites located within the corridor were recorded. In the section from Keo to Blytheville, Arkansas, a site density rate of 1.8 sites per linear mile was computed (Padgett 1978). The majority of cultural resources found were historic. This corridor passes through the northern part of the present project area.

The reports on the Buffalo Creek Project conducted by Soils Systems, Inc. (Dicks and Glander 1982a, 1982b) were not available at the Arkansas Archeological Survey or from the Memphis District Corps of Engineers. The best comprehensive overview of the region is provided in Archaeology of the Central Mississippi Valley by Morse and Morse (1983).

Chapter 2

PHYSICAL GEOGRAPHIC CHARACTERISTICS OF THE STUDY AREA

by

John C. Dixon

LOCATION

Ditches 7 and 13 are located in the northwestern corner of Mississippi County in northeastern Arkansas (Figure 1). The county is irregular in shape with a length of approximately 38 miles and a width of approximately 36 miles, covering an area of 932 square miles (Ferguson and Gray 1971). The county borders on the Mississippi River, with Missouri to the north and Tennessee to the east. Adjacent Arkansas counties are Craighead and Poinsett to the west and Crittenden County to the south.

Buffalo Creek Ditch is located partially within Mississippi, Craighead, and Poinsett Counties. The northern section of the ditch is within Mississippi County; the middle section of the ditch forms the boundary between Mississippi and Craighead Counties, and the southern section of the ditch is within Poinsett County.

Craighead County lies immediately to the west of Mississippi County. The county covers an area of 716 square miles. It is rectangular in shape, being 44 miles long and ranging from 12 miles to 20 miles wide (Ferguson 1979). The county is bounded to the east by Mississippi County; on the south by Poinsett County; on the west by Jackson and Lawrence Counties; on the north by Lawrence and Greene Counties, and Dunklin County, Missouri.

Poinsett County covers an area of 762 square miles and is approximately 42 miles wide and 18 miles long (Gray and Ferguson 1977). The county is bounded to the east by Mississippi County; to the south by Crittenden and Cross Counties; to the west by Jackson County; and to the north by Craighead County.

REGIONAL GEOMORPHOLOGY

The study area is located in the Eastern Lowlands physiographic province of the Mississippi Alluvial Plain (Figure 2). The Eastern Lowlands lie to the east of Crowley's Ridge

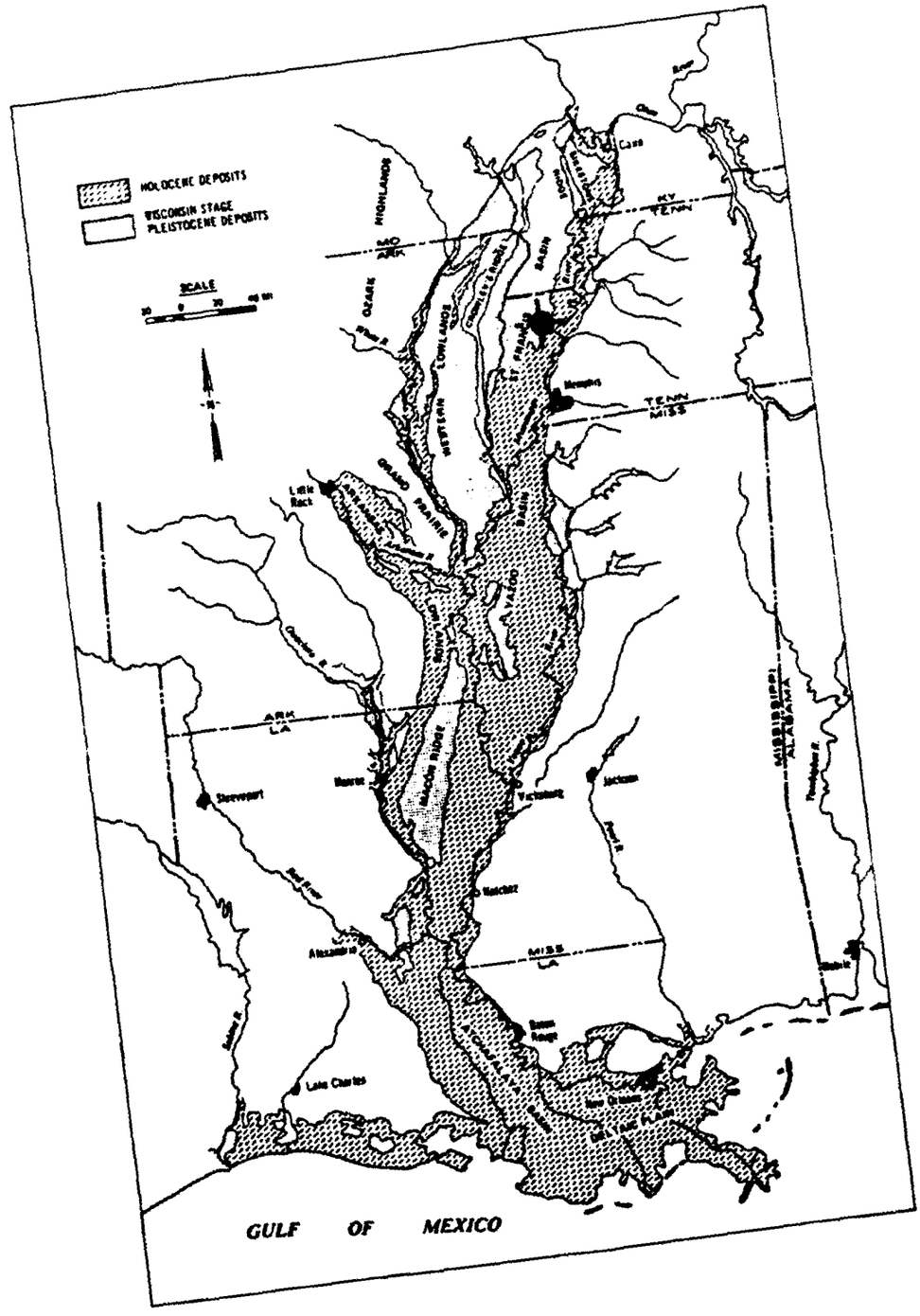


Figure 2. Simplified Regional Geomorphic Map of the Lower Mississippi River Valley, Showing the Location of the Study Area (after Saucier 1981).

and are characterized by a topography ranging from broad flat terraces to alternating swales and low ridges. The lowlands are developed on the thick alluvial sediments of the ancestral Ohio, Missouri, and Mississippi Rivers.

Within the Eastern Lowlands a variety of geomorphic and depositional environments exist. These include braided stream terraces, meander belts, backswamps, and natural levees.

The western portion of the lowlands is occupied by Pleistocene age braided stream terrace deposits. The terrace sediments were derived from glacial outwash transported by the Mississippi, Missouri, and Ohio Rivers. The sediment is composed of coarse to medium sand and gravel which extends to depths of as much as 200 feet below the terrace surface. The terraces are characterized by broad flat to gently rolling stream surfaces with sinuous, flat bottomed relict braided stream channels. The braided stream channels are commonly infilled with fine sandy sediments. Fine-grained channel fills also occur on this surface. These channel fills are much younger than the terrace deposits and represent fluvial deposition during the Holocene (Saucier 1974).

To the south and east of the braided stream terraces are the younger, Holocene age meander belts of the Mississippi and adjacent rivers. The meander belts consist of a diversity of fluvial landforms and deposits. The dominant landform of the meander belts is the point bar which consists of parallel, arcuate ridges and swales developed in laterally accreted sands and gravels (Saucier 1974).

Within the meander belts are numerous abandoned channels in various stages of infilling. Completely infilled, abandoned channels are referred to as clay plugs and consist of thick deposits of silt and clay which may reach thicknesses of as much as 100 feet. Adjacent to the abandoned channels, as well as modern channels, are natural levees and their associated deposits. Natural levee deposits are silty and sandy clays which overlie lateral and vertical accretion deposits. The natural levees are characterized by smooth to undulating topography that slopes from the margins of their parent streams at angles of less than 5 feet per mile. The natural levees commonly constitute the greatest relief in the meander belt (Saucier 1974).

Marginal to the meander belts are the backswamp areas. The backswamps represent areas of sediment aggradation associated with the deposition of silts and clays carried into the area by floodwaters. Depositional environments range from infrequently flooded bottomlands to permanent lake-filled swamps. The backswamps occupy the topographically lowest parts of the floodplains (Saucier 1974). The geomorphological history of the project is discussed in more detail in Chapter 8.

CLIMATE

The study area is located within the humid Subtropical (Cfa) climatic region of the Koppen climate classification system. Summers are warm, while the winters are mild. Occasional severe winter storms occur in the region, generally associated with cold fronts ahead of Continental Polar air masses. Most of the precipitation is in the form of rain, though snow does occasionally occur. Summers are hot and humid due to the influence of Maritime Tropical air masses over the region.

In Mississippi County, at Blytheville, the average annual daily maximum temperature is 72 degrees fahrenheit, ranging from a low of 49 degrees in January, to a high of 92 degrees in July. Average annual daily minimums ranging from 31 degrees in January to 70 degrees in July (Ferguson and Gray 1971). At Jonesboro, in Craighead County, average annual temperature is 61 degrees fahrenheit with average monthly temperatures being lowest in January (39.1 degrees) and highest in July (81.4 degrees). Average annual daily highs are 71.4 degrees, with January lows of 48.1 degrees, and July highs of 91.9. Average daily minimums are 50.7 degrees with January lows of 30.1 degrees and July highs of 70.8 (Ferguson 1979). These data are similar to the Blytheville data. At Marked Tree in Poinsett County average annual temperature is 60.4 degrees with an average January low of 38.9 degrees and an average July high of 80.9 (Gray and Ferguson 1977). Temperatures are a little cooler than those of Mississippi and Craighead Counties.

Precipitation is distributed fairly evenly throughout the year in all three counties of the study area. There is, however. considerable difference in the total rainfall amounts received at each of the recording stations, and in the seasonal pattern of distribution. At Blytheville average annual precipitation is 47.47 inches. Average January highs are 5.45 inches and average October lows are 2.8 inches. Precipitation is most abundant in winter and early spring. Precipitation falls as rain in association with the passage of fronts. Thunderstorms are responsible for most of the summer precipitation. Snowfall is a negligible source of precipitation (Ferguson and Gray 1971). At Jonesboro average annual precipitation is 48.13 inches, with average April highs of 5.16 inches and October lows of 2.47 inches. Precipitation is most abundant in the spring and late fall, occurring as rain in association with frontal activity. Convectional thunderstorm activity is responsible for the precipitation that falls in the summer. Snowfall is negligible, amounting to only about seven inches per annum (Ferguson 1979). Average annual precipitation in Marked Tree is 49.9 inches, noticeably higher than at Blytheville or Jonesboro. Precipitation is most abundant in the spring, with March highs of 5.1 inches and October lows of 2.5 inches. Again a bimodal pattern of precipitation is observed in spring and fall with most of the precipitation occurring as rain in association with the passage of frontal systems. Summer rain occurs as convectional thunderstorms. Snowfall is minimal (Gray and Ferguson 1977).

Drought is a characteristic feature of the climate, occurring between August and October when temperatures are moderately high and precipitation is moderately low. Severe storms also occur in the study area in the form of spring tornadoes and summer thunderstorms. All three counties of the study area experience long periods of frost free conditions, generally over 200 days from March to October.

SOILS

Soils within the study area are diverse, consisting of a number of series. A brief description of each follows.

Amagon Series soils occur on the lower slopes of natural levees bordering stream channels. The Amagon Sandy Loam in this study area consists of four to eight inches of sandy loam surface soil over a subsurface soil of gray silt loam of about the same depth. The subsoil extends to a depth of approximately 60 inches and consists of gray and light brownish gray silty loam with brown and red mottles. The soil has low permeability, high available water capacity and is of medium to strong acidity (Ferguson and Gray 1971).

Dundee Series soils consist of dark grayish brown or brown silt loam, or sandy loam over dark grayish brown or grayish brown silty clay loam, and silt loam with yellowish brown mottles. Below this layer is a mottled brown, grayish brown or yellowish brown, and dark reddish brown sediment of silt loam to loamy sand. The Dundee Silty Loam in this study area has a dark grayish brown or brown silt loam surface horizon. The subsoil consists of dark grayish brown and grayish brown silty clay loam and silt loam with yellowish brown mottles. The parent material consists of grayish brown and yellowish brown sediments with brown mottles. Some sandy clay loams also occur within this soil series. The soilscape is often undulating in nature. This soil is moderately permeable and possesses high available water capacity and is medium to very strongly acid (Ferguson and Gray 1971).

The Dundee-Dubbs-Crevasse soil complex occupies extensive areas of western Mississippi County. The complex consists of 50% Dundee soils, 25% Dubbs soils, and 20% Crevasse soils. The remainder of the complex consists of Amagon soils. The Crevasse soils occur as patches of sand that are associated with fissures that opened in association with the New Madrid earthquake of 1811. The sandblows are roughly circular in shape, with diameters of 8-15 feet, and 3-6 inches high. Some blows are as much as 100 feet wide and as much as 600 feet or more long. Dundee and Dubbs soils occur between the blows and patches of sand. Characteristics of the Dundee soils have been described above. Dubbs soils have a pale brown and dark grayish brown sandy loam and silt loam surface horizon that is about 11 inches thick. The upper part of the subsoil is a yellowish brown silt

loam, while the lower subsoil is a dark yellowish brown sandy clay loam. The parent material consists of yellowish brown loamy fine sand. Water movement is moderately slow through Dundee soils, moderate through Dubbs and rapid through Crevasse soils. Dundee and Dubbs soils have high available water capacity, while Crevasse soils have a low water holding capacity (Ferguson and Gray 1971).

Hayti Series soils occur on the lower slopes of natural levees, where they form in loamy sediments. The Hayti Fine Sandy Loam in this study area has a very dark grayish brown fine sandy loam surface layer that is 5-10 inches thick. The subsoil consists of gray and grayish brown silt loam or silty clay loam, loam, and sandy clay loam with brown and red mottles. The subsoil extends to a depth of approximately 52 inches. The parent material consists of gray, sandy clay loam and sandy loam. Water moves through the soil slowly and, therefore, it possesses high available water capacity. The soil is slightly acid to mildly alkaline (Ferguson and Gray 1971).

The Bowdre Silty Clay Loam is a member of the Bowdre soil series and is formed in thin beds of clay-rich sediments deposited in slackwater environments. The Bowdre Silty Clay Loam in this study area has a very dark brown silty clay loam surface horizon of some 4-7 inches in thickness. The upper part of the subsoil is very dark grayish brown silty clay, with yellowish brown mottles. The deeper subsoil is a yellowish brown and gray mottled loam. The parent material consists of two distinct horizons, the upper layer consists of mottled light gray, yellowish brown and brown fine sandy loam. Below this is a gray silt loam with dark reddish brown and strong brown mottles. This soil is also prone to swelling and shrinking. The soil is very permeable and is of slight to medium acidity (Ferguson and Gray 1971).

Soils of the Crevasse Series consist of upper horizons of very dark grayish brown loamy sand, and lower horizons of pale brown and dark grayish brown loamy sand and sand. The soils of this series occur on natural levees bordering stream channels. The Crevasse Loamy Sand in this study area has a very dark grayish brown to pale brown loamy sand 5-10 inches thick. Below this is a brown and dark grayish brown loamy sand and sand. This soil also includes areas with a sandy loam surface layer and soils in undulating areas with narrow depressions and low rises. The soil has a high permeability, low water holding capacity and is of medium acid to mild alkaline reaction (Ferguson and Gray 1971).

Iberia Series soils occur on floodplains, adjacent to major stream channels where they form on thick beds of clayey slackwater sediments. Iberia Clay in this study area is characterized by a black to very dark brown clay surface horizon 4-6 inches thick that overlies about 16 inches of black clay. The subsoil consists of black, very dark gray and gray clay with dark brown, yellowish red and yellowish brown mottles. The

parent material consists of gray and light olive gray silty clay to fine sandy loam that extends to a depth of about 47 inches. The soil swells when wet and cracks when dry. Soil water movement is rapid when the soil is cracked and slow when swollen. Available water capacity is high and the soil is slightly acid to mildly alkaline (Ferguson and Gray 1971).

Jeanerette soils make up a small proportion of the Amagon-Dundee-Crevasse Association and occur on level areas at the foot of low natural levees, where they form on loamy sediments. The Jeanerette Silt Loam in this study area has a 6-10 inch thick surface horizon of very dark grayish brown or dark brown silt loam. The subsoil consists of a very dark gray, dark gray, and gray silty clay loam and loam with dark yellowish brown and yellowish brown mottles that extends to a depth of 42 inches. The parent material consists of gray fine sandy loam, and dark gray silty clay. Water moves through the soil moderately slowly. The soil is slightly acid to mildly alkaline, and has high available water capacity (Ferguson and Gray 1971).

Routon Series soils occur on the shoulder and footslopes of natural levees on loamy sediments. The Routon-Dundee-Crevasse complex consists of about 35% Routon soils, 30% Dundee, and 25% Crevasse soils, with the remaining 10% consisting of Dubbs and Bruno soils. Dundee and Crevasse soils have been described earlier in this section. The Routon soils have a surface layer consisting of dark grayish brown sandy loam that is about six inches thick. The subsurface layer is a gray sandy loam approximately seven inches thick. The upper part of the subsoil is a dark gray silt loam, the middle part of the subsoil is a mottled grayish brown and yellowish red silty clay loam, and the lower part is a mottled grayish brown and yellowish red silt loam. Water moves through the Routon soil at a slow to moderately slow rate and the soil has a high available water capacity. The soils are of medium acidity to neutral soil reaction (Ferguson and Gray 1971).

Sharkey Series soils occur on floodplains where they develop in thick, clayey sediments deposited by slack water. The Sharkey-Crevasse Complex constitutes a patchwork soilscape of clay-rich Sharkey soils and sandy Crevasse soils in the western part of Mississippi County. Sharkey soils make up about 50% of this complex, and Crevasse soils about 30%. The remaining 20% is made up of Steele and Tunica soils. Crevasse soils have been previously described in this section. Sharkey soils consist of a very dark grayish brown or dark grayish brown silty clay loam surface horizon that is 4-8 inches thick. The subsoil is dark gray or gray clay with dark brown or dark yellowish brown mottles. The soil is poorly drained and swells and shrinks when wet and dry respectively. Water moves slowly through the soils except when they are cracked. Available water capacity is high. Sharkey soils are slightly acid to moderately alkaline (Ferguson and Gray 1971).

Steele soils occur on broad flat areas in sandy, loamy and clayey sediments. They consist of surface layers of dark grayish brown or brown loamy sand or silty clay loam. The upper subsoil consists of loamy sand overlying gray silt loam and dark gray clay with yellowish brown mottles. Steele and Tunica soils in this study area are composed of about 50% Steele soils and 40% Tunica soils, the remaining 10% consist of Sharkey soils. Water moves rapidly through the sandier upper horizons of Steele soils, and slowly through the lower clay-rich horizons. Steele-Tunica soils are slightly acid to moderately alkaline. Available water capacity is moderate in Steele soils and high in Tunica soils (Ferguson and Gray 1971).

Tiptonville Series soils occur on the lower slopes of natural levees on beds of loamy alluvium. Tiptonville and Dubbs Silt Loams in this study area consist of about 50% Tiptonville soils and about 40% Dubbs soils, with the remaining 10% consisting of Dundee soils. The soils of the Tiptonville Series consist of very dark grayish brown or brown silt loam and loam. The lower part of the subsoil displays brown mottles. The parent material consists of yellowish brown fine sandy loam with gray and yellowish red mottles. Dubbs soils have been described earlier in this section (Ferguson and Gray 1971).

Tunica Series soils occur in the higher topographic positions and have formed in moderately thick loamy slackwater deposits. The Tunica Silty Clay in this study area has a very dark grayish brown, dark brown, or dark grayish brown, silty clay surface horizon that is 5-9 inches thick. The subsoil consists of dark gray and gray clay or silty clay and silty clay loam which extends to a depth of about 45 inches. The parent material consists of silty clay loam, silt loam or fine sandy loam. The soils crack when dry and expand when wet. Water moves slowly through the swollen soil, available water capacity is high, and the soil is slightly acid to moderately alkaline (Ferguson and Gray 1971).

VEGETATION

Vegetation in the study area is dominated by cultivated crops consisting mainly of cotton, soy beans, and rice. What little natural vegetation remains occurs primarily in Big Lake, along the valley of the Right Hand Chute of Little River, and along the levees and spoil mounds adjacent to ditches and streams.

On the uplands of the region, the original vegetation was dominated by pines and hardwoods. The most common species were red oak, white oak, post oak, willow oak, water oak, black walnut, magnolia, hickory, sweetgum, blackgum, ash, yellow poplar, and shortleaf pine (Gray and Ferguson 1977). In the bottomlands, dense hardwood forest cover was found. Bald cypress grew in swampy area. In low-lying, frequently flooded areas the vegetation was dominated by water tupelo, sweetgum, soft elm,

green ash, hackberry, cottonwood, overcup oak, and willow oak. On the low ridges of the interfluves the principal trees were pecan, hickory, white oak, red oak, blackgum, and winged elm (Gray and Ferguson 1977).

Today, the greatest diversity of hardwoods in the area occurs in Big Lake. This vegetation is distributed according to the elevation of the land in the lake and the associated degree of soil saturation (Smith et al. 1984). At the higher elevations where the best drained soils occur, the following tree species occur: sycamore, pin oak, sweetgum, pecan, river birch, cottonwood, hackberry, overcup oak, mulberry, boxelder, and some bald cypress and willow (Smith et al. 1984).

In those areas of Big Lake where standing water of a few inches occurs year round, the following species occur: green ash, water elm, water locust, water tupulo, some overcup oaks and willows (Smith et al. 1984). Where the soil is flooded to a depth of one foot most of the year, a different assemblage of hardwoods occurs. This area is characterized by the occurrence of predominately bald cypress, with the remaining 40% of this zone consisting of green ash, water locust, water elm, swamp privet, willow, and occasional red maple (Smith et al. 1984).

Where water stands at a depth of 18 inches most of the year, willow is the dominant species, with some swamp privet and button bush (Smith et al. 1984).

WILDLIFE

Wildlife in the study area is abundant and diverse. There are many species of birds, mammals, reptiles, amphibians and fish. The most diverse assemblage of wildlife is to be found in the Big Lake Wildlife Refuge in the eastern part of the study area. Mammals living in the wildlife refuge include raccoons, muskrats, beaver, mink, bobcats, opossums, skunks, red and gray foxes, and white-tailed deer. There are 22 species of mammals, 27 species of reptiles, 8 species of amphibians, and 38 species of fish reported from the refuge (United States Department of Interior 1974).

By far the greatest abundance and diversity of wildlife are found in the 200 or so species of birds that have been identified in the refuge. As many as 30,000 waterfowl are to be observed in the refuge in the winter. About 90% of these are mallards. Other species commonly observed include: Canada geese, wood ducks, hooded mergansers, herons, egrets, terns, gulls, snipes, and woodcocks. Endangered and rare species in the area include: bald eagles, osprey, brown pelicans, wood ibis, and peregrine falcons (United States Department of Interior 1974).

Chapter 3

CULTURAL HISTORY

by

Robert A. Taylor

PALEO-INDIAN PERIODS

Although people have lived in the St. Francis basin since about 9000 B.C., evidence of the earliest habitation (known as the Paleo-Indian period) is rare, consisting only of isolated finds of distinctive, fluted projectile points. These projectile points are assigned to the Crowley's Ridge phase and Sedgwick phase, each phase representing a particular distinctive point style (Morse and Morse 1983:61). No intact sites have been discovered, and there are no direct indicators of Paleo-Indian lifeways. Based on ethnographic studies of primitive societies and paleoenvironmental reconstructions, small band level societies probably depended for subsistence on a combination of hunting and fishing and collecting edible wild plants. Some intact sites of this time period (9,500 to 8,500 B.C.) may be preserved on late Pleistocene braided stream terraces buried by subsequent alluvium of the basin.

DALTON AND ARCHAIC PERIODS

The next oldest prehistoric cultural period recognized in the St. Francis basin is the Dalton, or Early Archaic, period. Again, distinctive projectile points are the markers for this cultural horizon, although known sites have produced an extensive stone tool assemblage. Direct data on non-lithic tools, floral and faunal resources, and social organization are lacking, although a sophisticated band level organization utilizing high biomass game animals, fish and wild plants is postulated. The Dalton period in northeast Arkansas is known as the L'Anguille phase, and in southeast Missouri as the Bloomfield Ridge phase; it dates from about 8,500 to 7,900 B.C. (Morse and Morse 1983:71).

Several other projectile point types found in northeast Arkansas have been assigned to the Early Archaic period. These types post-date the Dalton period, and Morse and Morse (1983:99-113) interpret their appearance as evidence of adaptation to a warm, dry climate beginning about 7,000 B.C. This period of warm, dry climatic conditions, known as the hypsithermal, lasted from about 7,000 to 3,000 B.C. (Morse and Morse 1983:99). During

this time, human occupation of the St. Francis basin probably became less intense, and in the period known as the Middle Archaic, the basin may have been seasonally used by populations residing outside the area.

The return of a cooler, wetter climate about 3,000 B.C. corresponds to the beginning of the Late Archaic, or Poverty Point, cultural period, which lasted until about 500 B.C. (Morse and Morse 1983:115). This period is characterized by a variety of projectile point types and ground and polished stone artifacts, including atlatl weights, axes, beads, and tubular pipes. There are also indicators of widespread trade networks represented by artifacts such as marine shells from the Gulf coast and novaculite from southwest Arkansas. One of the horizon markers for the Late Archaic period is the presence of fired clay balls known as Poverty Point objects. These presumably functioned as heating elements in earth ovens. Clay balls are not common in the St. Francis basin; but sandstone and chert can also be used in earth ovens, and fire cracked rock is common on many Late Archaic sites. Late Archaic trade networks and the numerous sites attributable to the period suggest an increase in population from the preceding periods, and these populations were probably organized at a tribal level, more complex than the earlier band level societies (Morse and Morse 1983:132).

WOODLAND PERIODS

The Woodland period of prehistoric cultural development is identified in the St. Francis basin by the presence of pottery vessels tempered with clay or sand. The Early Woodland period, dating from 500 B.C. to 0, and also called the Tchula period, is represented by non-ceramic artifacts similar to the artifacts of the preceding Late Archaic period. The addition of pottery to the tool assemblage indicates a new cooking technology, and the presence of cultivated plants in the Tchula period indicates a more sedentary settlement system than in earlier periods. However, the Late Archaic earth oven method of cooking is still used along with the Woodland cooking pots, and the cultigens found on Tchula period sites developed during the Late Archaic also. The noticeable correlation of agriculture, pottery, and burial mounds suggests increased social and ceremonial organization during the Woodland period. The Tchula period is represented in the present project vicinity by one excavated site, the McCarty site (Morse 1982a), which has been assigned to the Pascola phase (Morse and Morse 1983:145-159), and by one recently tested site assigned to the Tchula period on the basis of its similarity to the McCarty site (Taylor and Spears 1986).

The Middle Woodland period, known as the Marksville period in the central Mississippi valley and the St. Francis basin, dates from 0 to A.D. 400. This period is represented just south of the present project by the Helena phase, named after a complex of burial mounds at Helena, Arkansas, near the mouth of the St. Francis River. The phase boundaries extend up the St. Francis to

near Parkin, Arkansas, but no sites are reported in the present project vicinity (Morse and Morse 1983:172-175). Known sites of the Helena phase contain the exotic artifacts typical of the Middle Woodland period, representing trade networks extending from the Gulf coast to Canada and as far west as the Rocky Mountains. Grog tempered pottery, decorated by incising, punctating, red filming and stamping, is characteristic of the Marksville period.

The Late Woodland period in the project vicinity dates from A.D. 400 to 700. The project is north of the boundary of the Baytown phase, identified by grog tempered ceramics decorated primarily by cordmarking. In the project area Late Woodland sites contain sand tempered pottery characteristic of the Dunklin phase. The two types of tempering may represent social groups organized into two separate tribes each possessing a different settlement pattern and social organization (Morse and Morse 1983:180-199). There seems to be an increase in population during the Late Woodland period. This population is widely distributed throughout the lowlands of the St. Francis basin on small sites that probably reflect the seasonal exploitation of specific, varied environments and on larger sites which were occupied on a semi-permanent and permanent basis.

MISSISSIPPIAN PERIODS

About A.D. 700, the grog tempered and sand tempered ceramics of the Woodland period were replaced by shell tempered pottery. This technological innovation, along with the introduction of the bow and arrow, signaled the beginning of the Mississippian cultural period. Early Mississippian populations were commonly distributed very much like the Late Woodland populations of the Baytown phase, in varied environmental zones. Archeological indicators of social organization suggest the development of incipient chiefdoms in the Early Mississippian period, with well organized villages and distribution systems. By A.D. 1000, these villages were becoming stratified politically, and were oriented around prominent civic-ceremonial centers with mounds. These mound centers served individual, independent chiefdoms recognized archeologically by significant variation in the decorated ceramics. All of these chiefdoms participated in broad exchange networks and a common ceremonial complex represented by shell ornaments, embossed copper plates, exotic lithics and human figurines. The Middle Mississippian period, which dates from A.D. 1000 to 1350, is represented in the present project area by the Cherry Valley phase (Morse and Morse 1983:241-246). By A.D. 1350, the populations in the St. Francis basin had become nucleated in large, fortified villages. These large villages indicate increasing levels of conflict among complex, powerful chiefdoms, and are the primary characteristic used to define the Late Mississippian period. One marker for this period is a distinctive arrow point which may have been developed specifically for warfare (Morse and Morse 1983:271). These chiefdoms continued to develop until their populations were

decimated by diseases introduced with the earliest European explorers, and by A.D. 1673 only the Quapaw remained in any numbers in the central Mississippi valley (Morse and Morse 1983:300-301).

PROTO-HISTORIC PERIOD

The earliest of the European explorers was De Soto, with his expedition of 1541. Morse and Morse (1983:305-315) have summarized a probable route of the expedition that would have taken the explorers up the St. Francis River, passing very near the present project locality. Sixteenth century European artifacts have been found at the Parkin site a few miles downstream from the present project (Klinger 1977). The area was probably not again visited by Europeans until the Marquette expedition of 1673. By 1828, the native populations had been removed by treaty from Arkansas to the Indian Territory.

HISTORIC PERIOD

Soon after the removal of the native populations, the St. Francis basin became sparsely settled by subsistence farmers who probably derived a large part of their food and some income from hunting. Because of the swampy conditions in the area, much land was undeveloped and remained available for homesteading through the first third of the twentieth century. Timber harvesting was a major economic enterprise during this period, and was followed closely by farmsteads. These farm populations have followed the pattern set by their prehistoric predecessors in becoming increasingly nucleated and more dependent on broad exchange networks.

Chapter 4

History of the Buffalo Island Area

by

Phyllis A. Morse

THE EUROPEAN PERIOD 1500-1803

When Marquette and Joliet journeyed down the Mississippi River from French Canada in 1673, they discovered that this stream emptied into the Gulf of Mexico. This knowledge inspired plans for a French North American empire (Conrad 1982:102). Reni-Robert Cavalier de La Salle explored the lower Mississippi area to see whether a continent-wide economic base was possible, tying together the Great Lakes and the Mississippi. He claimed Louisiana for France in 1682. The first European settlement was founded in 1686 with the establishment of Arkansas Post at the mouth of the Arkansas River.

Spain continued to claim the Lower Mississippi Valley, and formally took title from France in 1762, when the Treaty of San Ildefonse was signed (Bannon 1974:9). Although Spain controlled the area, many resident Frenchmen served as officials and very few persons of Spanish ancestry settled there. Almost the entire population of the Lower Mississippi Valley remained of French descent (Gerlock 1976:11).

The Spanish began to encourage "American" settlements in 1797 by offering free lands, seed, tools, animals, and tax exemption to potential settlers (Gerlach 1976:15). Various land grants with irregular boundaries, rather than square townships, were awarded and still exist today.

France reclaimed the Lower Mississippi in 1800; Napoleon then sold the territory to the United States in 1803. French and Spanish land claims to parts of the area were honored by the United States, although they complicated the granting of lands for settlement. The settlement by Euro-Americans in the Arkansas area was sparse before 1803 with fewer than 2,000 people were living between New Madrid, Missouri and the Arkansas River (Kniffen 1971:49). Only individuals who were Catholic and willing to swear allegiance to the Spanish king were permitted to purchase land. Protestants were allowed to settle in Missouri after 1795 (Gerlach 1976:11).

THE LOUISIANA PURCHASE 1803-1836

After 1803, the Louisiana Purchase lands were open for colonization with the primary routes of transportation being the major waterways. The earliest settlements in Arkansas were mainly in the uplands and foothills of the Ozarks and on the levees of the Mississippi River; however, widely spaced single family dwellings often appeared in the lowlands as well. As Schoolcraft described in his journal of 1818, many of these families moved every two or three years, building another log cabin and clearing enough land to grow corn (Park 1955). Their subsistence focused mainly on hunting. But Schoolcraft also found other more permanently settled families who had cabins with several rooms, fenced gardens, and smokehouses. The notion that the lowlands were not settled until drainage of rivers occurred is not reflected by either the archeological or historical record.

In the years following the Louisiana Purchase of 1803, there was a rapid increase in population. The number of Euro-American residents of Missouri doubled in six years and then tripled in the next ten years (Gerlach 1976:23). The Osage claimed northeast Arkansas as part of their hunting territory, but ceded this claim in the treaty of Fort Clark in 1808. Another factor contributing to the increase in population was the granting of land to veterans of the War of 1812 as a bonus for their bravery and service to their country.

The New Madrid earthquakes of 1811-1812, however, temporarily discouraged settlement of northeast Arkansas and southeast Missouri (Penick 1976). In 1810, New Madrid County had a population of 3,165, but by 1830 the population was only 2,350 (Penick 1976:51). The United States government offered other tracts of land to exchange for those in the New Madrid area. Unfortunately, speculators bought up much of the property before the exchange became widely known (Penick 1976:49). To confuse the land titles further, many New Madrid settlers sold their land claims several times. After 1830 the tremors ceased to be as violent and the population of the area began to increase again.

After the Louisiana Purchase, Arkansas became part of the District of Louisiana and in 1805 it was reclassified as being in the territory of Louisiana. Arkansas fell under the Missouri territory jurisdiction in 1815, became a territory of its own in 1819, and finally became a state in 1836. In 1833, Mississippi County, Arkansas was formed out of Crittenden County. Unfortunately, most of the early county records were destroyed in the Civil War when a boat shipping them to Memphis was sunk.

IMMIGRATION AND HOMESTEADING IN ARKANSAS 1836-1861

People began immigrating to Arkansas to obtain free land to homestead (Walz 1958:309). As early as 1840, settlers could obtain tax-forfeited lands in 160 acre plots by promising to pay

the taxes in the future. That same year the census reported the population of Mississippi County to be comprised of 900 whites and 510 slaves most of whom lived near the Mississippi River. This was before the Homestead Act of 1862.

By 1850, the federal government gave the State over 7 million acres of swamp and overflow land to sell. The proceeds were to be used to pay for reclamation, particularly the construction of levees. Land sold for as little as fifty cents an acre. Over 2 million acres of railroad lands were given to the state in 1853 for development of railroad right-of-ways. Alternative sections six miles wide were given to railroad companies who could then offer it to the public. The remainder of the public land in Arkansas was to be sold under the Homestead Act of 1862. Only 80 acres could be obtained per family by those qualifying. However, squatting rather than purchase was apparently the norm. In 1850 in one county, there were 448 families recorded by the census and only 64 landowners were assessed for taxes that particular year (Walz 1958:314).

At the Zebree site on the west edge of Big Lake, a cypress lined well 400 cm deep was found which dates to 1830-1845 (P. Morse 1980:26, 18). There is no record of anyone legally claiming title to that area during this particular time; however, the archeological record indicates that a prosperous family was present. Their presence is reflected in the artifacts recovered of English origin such as handpainted peachware, blue shelledge pearlware, blue and red transfer printed pearlware and a scimitar-shaped knife. Other objects in the well included a shoe heel, a bucket base, lead, a draw knife blade, hooks and eyes, an iron skillet, square nails, bone and glass buttons, and marbles, all suggesting commercial contact with the outside world. Their method of subsistence is indicated by the presence of corn cobs, peach and plum pits, watermelon and muskmelon seeds, a peanut shell, egg shells, and pig and chicken bones. These data suggest the presence of a kitchen, garden, and an orchard. The amount of time taken to dig the well implies a long-term settlement. No other remains of a pioneer settlement were found. This location, a relatively high area of land previously occupied by three separate prehistoric groups, was obviously a desirable spot for a small agriculture based habitation.

THE CIVIL WAR 1861-1865

The Civil War was a time of extreme population disruption in northeast Arkansas. This was due more to the depredations of various bands by jayhawkers and guerrillas than actual military action. Refugee families of the war moved to Texas or to the new states in the northwest by steamboat and wagon train. Outlaw bands, comprised mostly of deserters or draft dodgers, preyed upon those with northern and southern sympathies alike (Huff 1965:127).

The Big Lake area harbored several guerrilla groups during the Civil War. On September 7, 1863, an expedition of 200 men and 1 cannon was sent to Big Lake from Camp Loury, Missouri, to capture or drive out one of these bands. Although 200 more soldiers were sent as reinforcements, only 13 "noted guerrillas" were killed (U.S. War Department 1888, 22:616). Some 30 other guerrillas were captured along with horses, mules, and guns. According to Major Fred Poole, leader of the skirmish, the people of Arkansas appeared to be more loyal to the United States than the residents of Missouri.

Another force of the Missouri Light Artillery entered Mississippi County on April 5, 1864 (U.S. War Department 1888, vol. 34:872-873). Major Rabb and 100 men proceeded from the Mississippi River to Chickasawba settlement, near the present town of Blytheville, on Pemiscott Bayou. To reinforce this detachment another 100 soldiers joined them from Osceola. A gang of guerrillas was encountered; however, most of them escaped into the heavily timbered, swampy country. The next night the Missouri Light Artillery was attacked by a band of 100 outlaws, losing 2 men. Papers found on one guerrilla estimated around 1,000 men comprised the various bands in northeast Arkansas.

BUFFALO ISLAND AREA COLONIZATION 1830-1897

The area between the Little River and Big Lake on the east to the St. Francis River on the west is called Buffalo Island (Jones 1976:2A). It is about 40 miles long and 10-16 miles wide in the vicinity of three major towns: Manila, Monette, and Leachville. The area takes its name from the plentiful game which used to be present in the area; however, buffalo never inhabited northeast Arkansas (Jones 1976:2A). Numerous canebrakes at one time in Buffalo Island offered shelter to turkey, deer, bear, and fox. Fur traders traveling from Cape Girardeau, Missouri, came to trade with the Indians living on the shores of Big Lake.

In 1832 the first recorded Euro-American to settle on Buffalo Island was Ed Mattix. He came from Kentucky, claimed land, built a log cabin, and cultivated crops. Population growth was negligible until the lumber industry moved to northeast Arkansas in the 1890s. The first general store was not built in the Buffalo Island area until 1898, when Monette was established (Town Crier 6-17-76:4B).

Thomas Varner, a surgeon who accompanied the Cherokee to Chilicataw-near Kennett, Missouri, remained there and married a local woman. His son, Francis H. Varner, was born in Chilicataw in 1841. The family built a houseboat, floated down a tributary of the St. Francis, and settled in the area known as Buffalo Island (Buffaloe 1960:152). They built a corral at Upper Poplar Ridge, about 4 miles west and 1/2 mile north of Monette, Arkansas. Dr. Varner allegedly killed 2 buffalo and captured a calf on one hunting expedition when they first arrived. Next

they took their houseboat some 8 miles to the southwest and encountered the cabin and clearing of Mr. Mattix. Dr. Varner purchased the area from him in 1844. The site of this clearing is about 1/4 mile west of Mangrum Cemetery where Dr. Varner is buried.

"France" Varner grew up as a woodsman. He was never taught to read or write; nevertheless, he learned to captain a steamboat and eventually owned one which operated on the St. Francis and Little River. He brought household goods to the Buffalo Island area. He also owned and operated a sawmill, a cotton gin, and a gristmill.

The reminiscences of "France" Varner are representative of the nineteenth century inhabitants of the Buffalo Island area. These people anticipated a flood every spring from the Mississippi River. Higher ridges were the areas of older settlements where cattle were driven when flooding began. Most of the recorded Varner stories concern various feats of hunting, particularly of panthers and bears. The reputation of Northeast Arkansas as a wildlife paradise is reinforced by these pioneer memories.

THE BIRTH OF THE RAILROADS AND THE FORMATION OF LEVEE COMMISSIONS 1897-PRESENT

The Buffalo Island area depended mainly on steamboat transportation for no bridges connected this area to the rest of the county until recently (Dew 1968:23). However, major railroads were built around the area, particularly the Cotton Belt, Iron Mountain, and Frisco Railroads. In 1897, the Jonesboro, Lake City, and Eastern Railroad Company (J, LC & E) was formed to build a line from Nettleton to Lake City. It took only six months to build the first segment of the railroad, the major economic incentive being the untapped timber resources present in the "sunk lands" area of Buffalo Island. Ultimately the St. Francis River had to be bridged for further development. This was accomplished by borrowing pile driving equipment from the Kansas City, Ft. Scott, and Memphis railroad. In 1899 Monette and Leachville were reached by the railroad and a short extension from Nettleton to Jonesboro was also completed.

The economic benefit to the area from the railroad was immediate. Over 100 new homes were built in Lake City six months after the railroad was completed (Dew 1968:26). New towns such as Black Oak and Monette were created along the railroad. Freight including logs, lumber, shingles, fish, and ducks were very profitable. In 1900, the J, LC & E reached Manila in Mississippi County. Two years later a bridge was built over Big Lake and by the end of that year the railroad stretched to Blytheville. The timber boom, with large orders such as 1 million railroad ties, attracted many loggers and saw mill operators to the area.

The homestead of Inness Sebree, dating to the 1895-1940 time period, is located along the edge of Big Lake (P. Morse 1980b). This place was previously mentioned in this text as the Zebree site. The exact spelling of the first homeowner was not known when the first excavation was undertaken. Various artifacts dating to this occupation were uncovered during the excavation of the Zebree site. Mr. Sebree was a hunting guide who made his living as a professional duck hunter. He brought in as many as 500 ducks per day. The Sebree home was a three room board and batten structure with its foundation resting on posts. On 40 acres of cleared land, corn, vegetables, and fruit were grown for household consumption. The main economic focus of the Sebree family was toward the lake and its many resources.

Artifacts from the Sebree occupation include: tin cans, a stone lid lifter, trunk corner braces, a bed rail, a hoe, a drawknife blade, buggy brow, and a harness loop. Other objects excavated relating to extra-activity patterns were fishing and hunting artifacts such as lead sinkers, various caliber shells, and a wader buckle. A log shackle indicates lumbering activity.

Since most of the timber along the railroads had been cut by 1913, the J, LC & E then employed a land agent to attract settlers to the area. Cut-over land was sold for $25 to $30 per acre to individuals who were given 6 to 10 year loans to purchase land at a six per cent interest rate (Dew 1968:29).

The advent of World War I continued the prosperity of the area. Farms growing corn, cotton, vegetables, wheat, oats, and alfalfa increased in number as agricultural prices rose, with cotton reaching 20 cents per pound.

Drainage activities continued during World War I, with the "final work" done in 1918. Dredge boats cut ditches throughout the area, and thousands of acres were reclaimed. At the end of the war an even larger land boom took place with land prices rising to over $100 per acre. For example, in one week the railroad immigration agent sold over $275,000 worth of land. Most sales were to small farmers in tracts of 80 acres or less. Farm size was limited by the size of the family, as all hoeing and picking of cotton had to be done by hand. Unfortunately, the land boom was short-lived. Cotton dropped to six cents a pound in 1920, and the price of wheat fell. Farmers would have lost their land but found employment digging new drainage ditches and building bridges over old ones. The railroad employed an agriculture agent to teach farmers about alternative crops and fertilizer.

In 1920, a cantaloupe and watermelon growing business was begun near Monette. This was instantly profitable, and many farmers began growing these crops as well as other vegetables. The Buffalo Island area still produces melons today.

The J, LC & E railroad faced increased competition both from private vehicle traffic and motorbus lines. In 1925, it was sold to the Frisco railroad. Most of the J, LC & E original line was torn up and removed in 1982. The ties were sold as garden timbers and the track land was returned to farming.

The St. Francis levee district was formed in 1892 (Anonymous 1944:8). A coordinated effort by all the affected counties was seen as the only way to develop the area. Representatives from southeast Missouri were included on the board. In 1893 the St. Francis district was formally incorporated by the Arkansas legislature. At this time, the sunk lands still owned by the State were given to the levee district to help finance improvements. Lands were sold from 50 cents to $2.50 an acre (Anonymous 1944:9).

Once an adequate levee was built along the Mississippi, the interior of the St. Francis basin could be divided into smaller drainage districts. These smaller drainage districts were formed by a petition of the major land owners, who would submit a plan by an engineer (Anonymous 1944:233). The plan and a tax schedule would be submitted to the county judge and a public hearing would be held. Once approved, a board of commissioners could sell bonds to pay for the excavation of the ditches. The formation of these individual districts was not always a routine matter. Often the major landowners were lumber companies who had no interest in draining the land (Simonson 1946:265). The public hearing to establish Drainage District 9 in Mississippi County was opposed by the local sheriff. A mob carrying pistols and bottles of whiskey held the county judge captive in his courtroom. After a while, the judge refused to continue the hearing. New officials had to be elected before the district was formed (Simonson 1946:271).

The improved drainage and transportation brought about economic prosperity almost immediately. Mississippi County, Arkansas grew more rapidly than any county in the United States between 1910 and 1920 (Simonson 1946:272). Furthermore, it became the second most populous county in Arkansas and was notable for its production of cotton.

An interview with Melvin Cude of Leachville, Arkansas, by Phyllis Morse tells a typical story of life in the Buffalo Island area in the early to middle twentieth century. In 1909, Mr. Cude moved into the Buckeye area, near Big Lake, from Hornersville, Missouri. He cleared an area for a garden and hunted. Mr. Cude remembers his father and Ennis Sebree killing the last bear in the Big Lake area in 1910. In 1909, a Mr. Cockrum killed 18 deer in one day in the same area. Mr. Cude lived there three years from which time he remembers there being solid woods between his father's clearing and Leachville to the southwest, with no other settlers in between.

Melvin Cude married Maggie Cude in 1919. He worked on a plantation near Clear Lake for $50 a month, plus a house, food and laundry. He was provided with a car. In the 1920s he played banjo in a dance band in a dance hall at the foot of Big Lake. He made up to $60 per night, but had to divide it with the rest of the band. His wife objected to his hours, so he quit.

A site of such a dance hall was located during an archeological survey of the Big Lake area (P. Morse 1979:22). Surface collections included an unusual number of jug fragments, as well as numerous bottle sherds. Window glass, a flow blue plate fragment, and white ironstone sherds were present.

There were several settled areas around Big Lake when Mr. Cude moved to the area in 1909. Cole's dock was on the Arkansas-Missouri state line where hunters and fishermen launched their boats into Big Lake. Ennis Sebree had a place on the western edge of Big Lake. He housed duck hunters and worked as a hunting and fishing guide. Buck's Point or Buckeye Landing was the next settlement to the south. This was an area homesteaded by Mr. Beckhardt, who transformed a houseboat into a home by placing it onto posts. He was also a hunting guide who later made a famous patented duck call. Rice Landing was the next settled area and had an ice house where ducks and fish were packed for shipment.

Rauls place was along Buffalo Creek, and had been settled since 1880. In 1882 there was a severe flood and the house was rebuilt on piers. The Rauls place was a stock farm, with hundreds of goats, sheep, and cattle. In the winter, the cattle grazed on wild grasses. In addition to raising livestock, they also cultivated cotton, corn, and hay.

Later this area was timbered. Buckeye Landing had a stave mill and a shingle mill near the Zebree site around 1912. Various restaurants and hotels were built to accommodate workers. Once the area was timbered, it was sold for farm land.

The county agent for the Buffalo Island area recorded his impression of the changes in agriculture in the last 75 years (Bilbrey 1976). The building of the levees prevented frequent flooding and made this a highly productive area. Land sold for $2.50 an acre in 1900 and was worth approximately $1,000 per acre in 1976. From 1920 to 1940 cotton was the main crop being farmed with mules and hand labor. One-row planters and walking cultivators were the only machinery used. Hand hoeing and hand picking was done by individual families on small holdings. Even with this mode of processing over 200,000 bales of cotton were produced in Mississippi County every year.

The schools held classes in July and August, releasing the children in the fall to work in the cotton harvest. They suspended school again in the spring to allow time for planting. Other crops planted besides cotton were corn and hay with

soybeans being introduced during World War II. All the small farms were individually fenced, and sand blows still mark some of these fences.

After World War II, with the widespread use of mechanized farming and a decline in the need for agriculture labor, farms became much larger with only a few specialized crops like cotton and soybeans being grown. In 1960, only one share cropper who farmed with mules was recorded in all of the Buffalo Island area (Bilbrey 1976:D1).

Farm holdings of over 400 acres are now the norm in the Buffalo Island area. The demands of modern agribusiness, with large heavy machinery and extensive land leveling for increased efficiency, have squeezed out the small subsistence farmer. In response to this there was an extensive outmigration of people from the area after World War II. The population has now stabilized, and various industries such as shoe manufacture are beginning to move overseas.

SUMMARY

The Buffalo Island area is now fully cleared for agriculture, except for the Big Lake National Wildlife Refuge. Economic development was halted several times during the last 200 years, particularly during the time of the New Madrid Earthquake and the Civil War. At the turn of the century the agricultural potential began to be developed when levees were built, the land was drained, and adequate transportation was provided. Population was sparse in the region until then, except for relatively self-sufficient families whose main occupation was hunting. Just as in the past, the Big Lake area is still a fishers' and duck hunters' paradise.

Chapter 5

FIELD METHODS AND PROJECT CONDITIONS

by

Carol S. Spears

FIELDWORK CONDITIONS

The archeological survey of almost 67 miles of ditch corridor was accomplished over a period of about 13 days by five persons (July 22-August 11, 1986). Weather during this time was extremely hot with temperatures reaching 100 degrees Fahrenheit. In July, the drought-like conditions had hampered crop growth and surface visibility in the corridor was good. Rain occurred by the middle of the project and crop growth rebounded. During initial site testing over a period of 14 days (August 11-30, 1986), there was little to no surface visibility. This was especially true in soybean fields which had been close-drilled. For this reason, it was not possible to conduct controlled surface collections at several sites. Also the dry clayey soils were difficult to excavate and in some instances a pick mattock had to be used. Screening was also difficult. The technique utilized was to throw all the chunky dry sediments into a screen where they were sifted and/or carefully troweled through.

On return visits to the project area in the winter (December 4, 1986, and February 11-17, 1987), surface visibility was excellent and soil moisture was ideal. The temperature, however, was extremely low.

CREW ORGANIZATION AND SURVEY TECHNIQUES

The fieldcrews were divided into two survey teams with two and three persons each. Each team was directed by a Co-Field Director (Carol S. Spears and Robert A. Taylor) or the Project Supervisor (Michael G. Million). Crewmembers on the project in the summer of 1986 were J. K. Finney and Sarah K. Huber. Most of the time, the crews operated semi-autonomously. However, the teams coordinated transects so that a vehicle would be at the end of the transect, and no team had to backtrack over the same area. During the first two weeks of the project, Million worked almost full time contacting landowners and land operators in order to gain permission for surveying the corridor.

The survey techniques used consisted of zig-zag pedestrian surveys on about 64 miles of corridor. In most transects visibility on the spoil was usually excellent because of a farm road paralleling the ditch or because crops planted on the spoil were stunted and sparse. A summary of vegetation and surface visibilities in the fields is presented in Table 1. On a few transects, the area between the crop rows had been recently tilled and not rained on. Since surface surveys rely heavily on artifacts being washed off by rain or irrigation systems, visibility was considered poor and these transects were walked a second time toward the end of the project. No new sites were found in the areas resurveyed.

About three miles of the project were wooded or covered in thick pasture grasses and had little to no surface visibility. In these areas, survey teams were spaced about 30 m apart, and screened shovel tests were excavated every 30 m.

The shovel tests were at least 30 cm in diameter and excavated to at least 50 cm. All sediments removed were screened through 1/4 inch mesh or carefully troweled if the sediments were too hard to screen. When cultural materials were found, the sediment levels in the test were accurately measured and described, and the depth of the artifacts or cultural level was recorded. All positive shovel tests excavated on archeological sites were profiled.

Sites found were initially recorded, evaluated, and plotted on day maps. Only diagnostic artifacts were collected at this time and these were tied into a temporary datum which was later mapped in with a transit. Flagging was used to mark the temporary datum and galvanized or copper pipes were set as permanent datums.

Table 1. Vegetation and Surface Visibility Estimates in the Project Corridor.

VEGETATION	VISIBILITY	MILES
DITCH 7		
Plowed Fields	80-100%	2.05
Soybeans	10-90%	9.65
Milo	20-70%	4.10
Cotton	50-80%	1.50
Weeds and Woods	0-90%	2.70
DITCH 13		
Plowed Fields	90-100%	5.90
Soybeans	50-90%	6.15
Milo	40-50%	1.35
Cotton	60-80%	5.35
Weeds and Grass	10-70%	2.25

LOWER BUFFALO CREEK DITCH		
Plowed Fields	80-100%	6.65
Soybeans	30-90%	12.01
Milo	30-60%	1.70
Cotton	40-80%	1.25
Weeds and Grass	10-90%	2.65
Rice	10%	.75
Corn	40%	.40

SURVEY RECORDS

The team leaders were responsible for recording information relative to transects and sites found. Arkansas site forms were filled out upon completion of the project.

At the end of each day, all temporary (or daily) site numbers were logged into the Daily Site Log and given a consecutive Project number. These numbers were written on the artifact bags and each bag was logged on the Field Specimen Log. All sites and transects were plotted on the Project Maps and the information transferred to the appropriate quadrangle. Daily transect information was logged into a chart in the field notebooks. Information included the transect number, distance covered, the quad map, the survey methods, the number of shovel tests, sites located, vegetation, soils, surface visibility, disturbances, obstructions to survey, sites found, and general comments.

SITE DEFINITION

A prehistoric site is defined as the location of at least one prehistoric behavior, depositional event, activity, or behavior as evidenced by one or more artifacts. Thus, prehistoric isolated finds including nondiagnostic artifacts are considered sites. However, a historic site had to contain a prominent feature, cluster of artifacts, or possess architectural or vegetation evidence, and date earlier than 1930. Miscellaneous historic debris, which has been strewn randomly over much of the landscape, and recent dumps along roads and in ditches were not recorded as sites. However, the locations of late period scatters were plotted on day maps which were then given to the project historian to verify construction and occupation periods. All historic structures within the project area were photographed. The historic information and artifacts from sites tested were analyzed by Phyllis A. Morse, the project historian.

During the initial discovery of prehistoric sites, preliminary information was gathered concerning the context of the site. In addition to descriptive field notes, this information included an assessment of the potential for intact

deposits or features, artifact density, temporal affiliation, significant or unique artifacts, and research potential. These evaluations were used to determine which sites warranted initial site testing.

INITIAL SITE TESTING

Surface Collections

In areas of adequate visibility (10-100%), such as the cleared or cultivated fields, where artifact densities were relatively high, controlled surface collections were made. Rows of 4 x 4 m units were laid out with wire flags and all artifacts in each square were collected. The collection rows were oriented so that they crossed over the center of the site in several directions. In addition, diagnostic artifacts found outside the collection grid were point plotted. When artifact densities were low and the site was located in a field, all artifacts were point plotted using a transit, stadia, and tape. For sites found on the spoil, the distribution of artifacts was mapped and a complete collection made.

Controlled Columns and Shovel Tests

Controlled columns consisted of 50 cm x 50 cm units which were excavated in 10 cm levels to about 50 cm below the surface. All sediments in these units were screened. One wall was profiled and most of these were photographed and mapped in with a transit.

Shovel Tests differed from Controlled Columns in that they were usually only 30 cm in diameter and they were not excavated in 10 cm levels. Shovel tests that did not contain cultural material or evidence of anthropic stratum were not always profiled. Sediments from these tests were not always screened.

Test Units

A minimum of one 1 m x 1 m test unit was excavated at each site discovered unless the landowner denied permission for testing or it could be conclusively demonstrated that no significant intact cultural resources occurred at the site. The test unit was excavated to determine if the site was eligible for nomination to the National Register and/or whether it would need further testing to determine eligibility. Units were laid out according to magnetic north, and all depth measurements were taken from the line level string attached to the southwest corner.

The plowzone was either excavated in 10 cm levels or as one unit. All other levels were excavated according to cultural or natural levels of no more than 10 cm in depth. Levels were troweled or shovel skimmed and all soil removed was dry screened through 1/4 inch mesh. The base of each level was scraped with a

trowel, photographed, drawn, and examined closely for features. If feature stains or clusters of artifacts were found, they were mapped, described, photographed, and artifacts given a separate provenience number.

A portion of each test unit was excavated at least two levels below cultural bearing levels. Once a test unit was completed, one wall was cleaned, photographed and profiled. Soil colors were described according to the Munsell Color designations. Upon completion, each unit was backfilled.

Site Mapping

A detailed map of the site including the work performed was drawn using a transit, stadia, and tape. All measurements were tied into a permanent datum or a metal pipe set at the ditch edge. This site datum was triangulated to at least two permanent reference points and when possible also tied into the Corps of Engineers surveying stakes.

Chapter 6

LABORATORY METHODS, LITHIC AND CERAMIC ANALYSES AND COLLECTIONS CURATION

by

Robert A. Taylor, Michael G. Million, and Carol S. Spears

LAB METHODS

All artifacts were returned from the field to the SPEARS laboratory and checked against the Field Specimen Catalog. They were then washed, air dried, and sorted. The collections include about 13,000 prehistoric artifacts, the majority of which are prehistoric ceramics. Controlled surface collections were conducted at one single component historic site (3MS211), but other historic artifacts were collected during investigations at multicomponent sites. Lithic analyses were accomplished by Robert A. Taylor. Michael G. Million conducted the ceramic analyses. Diagnostic historic artifacts were analyzed by Phyllis A. Morse. Non-diagnostic historic artifacts were tallied by J. K. Finney, Joanna R. Clark, or Carol S. Spears.

LITHICS

Lithic artifacts from each provenience were sorted into appropriate classes and entered on a lithic analysis form developed for the project (Appendix A). These analysis forms included the kinds of artifacts expected to occur in the assemblage on the basis of field observations. However, some of the classes of artifacts listed were not recognized in the collections during the analysis. Definitions of artifact classes are presented in Appendix B. Definitions of other lithic categories and raw material types which follow are partly derived from several sources including The Cache River Archeological Project (Schiffer and House 1975) and Village Creek (Klinger et al. 1985). Each identifiable tool found during this project was separated for further analysis and description. These descriptions are presented in Appendix C. Several selected diagnostic artifacts or tools were photographed and these are shown in Appendix D.

Raw materials in the collection were derived from several sources. The most common raw material was cobble chert from

Crowley's Ridge gravels, although some of the chert sorted as Crowley's Ridge chert may have been derived from similar gravel deposits elsewhere (cf. Lafferty et al. 1984:149).

A second raw material found on Crowley's Ridge is orthoquartzite. Although orthoquartzite is common on many sites in northeast Arkansas, including the nearby Zebree site, it occurred infrequently in the present collection.

A third distinctive raw material present in the collections is a whitish chert which probably originated in the Burlington limestone of Missouri and southern Illinois (Myers 1970). This chert has been referred to in local archeological reports as Dupo chert (Morse 1969:129), Crescent Quarry chert (Morse 1976:51; Sierzchula 1980:12; Iroquois 1979;1980), and Burlington chert (Iroquois Research Institute 1980). Pursuant to discussions with Dan F. Morse of the Arkansas Archeological Survey, all cherts similar in color and texture to any of these previous designations have been sorted as "Burlington-like" chert.

An "other chert" class was also used in the analysis. Most of the specimens attributed to this class are probably a typical Crowley's Ridge chert and Crowley's Ridge cherts that have been thermally altered. Other distinctive cherts occurred in low frequencies and were included in the "other chert" class. Among these were two specimens of Mill Creek chert (Morse 1975). No specimens were identified as Pitkin chert (Erwin 1972) or Penters chert (Manger 1986:210), although these types are sometimes found on sites in northeast Arkansas. The chert types and other lithic raw material classes used in the analysis are further defined in Appendix B.

CERAMICS

Introduction

The ceramic materials from this project have been classified using a two step procedure with an initial focus on physical attributes (specifically temper materials), and with subsequent derivation of pottery types (based on definitions of type standards in general usage in the archeological literature). A classification form (Appendix A) was devised to quantify the presence of each ceramic category by provenience. The vast majority of ceramic remains are fragments of pottery vessels (sherds) and pieces of amorphous fired clay.

Once washed, dried, and rebagged, each provenience was sorted in a tray under strong light. A hand loupe (10x) and binocular microscope (10-30x) were utilized when necessary. In order to clearly view the various paste components in pottery sherds, a single, small break was often made, usually on a corner, to expose the paste interior. Sherd edges are often eroded and worn but do occasionally exhibit coil breaks (where the sherd broke along a weak coil juncture). Interior and exterior surfaces were

examined for degree of smoothing, slip applications, cordmarking and other decorations, evidence of temper, adhering mineral or carbonized deposits, and any indication of manufacture technique, wear or usage.

The ceramic classification form (Appendix A) has been developed specifically for the materials anticipated within the project area. Five temper groups were selected to account for the expected variety of pottery wares; these temper groups are shell, sand/shell, sand, sand/grog, and grog. Initial classification by physical attributes is utilized since these characteristics are permanent and not subject to revisions in definition which pottery types sometimes undergo. Pottery types are extrapolated using the latest and most widely standardized taxonomy for this cultural area (Phillips 1970). Pottery type criteria are presented below.

The five temper groups were further subdivided into the three major portions of a vessel, the rim, body, and base. The analysis correlates these groups and subdivisions with two major surface treatment categories, plain and decorated. In this manner a tally in any one box supplies temper, vessel portion, and surface treatment (which generally correspond to individual pottery types). Each classification was assigned a unique accession number, the last digit of which is noted adjacent to the count box in the matrix of the form. Weights were measured on a sample of ceramics from test units to determine relative sherd size data for the vertical strata. Results of these analyses are presented in Chapter 7.

The form also contains categories for fired clay types and other ceramics which will be described after the temper group/pottery type definitions. Totals are tabulated on the right margin of the matrix for temper groups in total sherd count and by vessel portion. Along the bottom of the matrix, totals are tallied for plain and decorated surface categories. Sherd and fired clay fragments less than approximately 1/4 inch (5 or 6 mm) were bagged unsorted and catalogued under the category of "Unsorted Particles".

SHELL TEMPERED: Shell tempered pottery is diagnostic of Mississippian Culture. Vessels of this type have been constructed by the coil method using a paste made up of backswamp clays tempered with burned freshwater mussel shells. The shell appears as flat, plate-like particles usually no larger than 2-4 mm in diameter; finer particles in the form of a calcite 'dust' are also present but practically invisible. The shell generally constitutes about 10 to 15% by weight of the paste. The post-depositional effect of centuries of rain, with its carbonic acid, have in many cases leached the shell out of the sherds leaving only a thin, plate-like hole or lacuna. Shell tempered pottery is usually easy to identify, though magnification is sometimes necessary.

Due to post-depositional weathering, shell often seems very friable and soft in comparison to its sand tempered counterpart in the Woodland Barnes culture. However, during vessel manufacture and use it is a stronger and more durable pottery. Since the shell is lighter than the clay and it has a chemical bonding effect on the clay, shell tempered pottery could be made into a larger variety of thinner and more spherical forms. Thin, round-bottomed vessels were efficient to cook with and lasted longer. Jars and bowls are the most common vessel forms. Wall thicknesses range about 4-5 mm on the smaller vessel forms.

Salt pan sherds were few and seemed to range about 7-10 mm in thickness and 4-7 mm on the larger jars. Surface treatment is usually plain, moderately smoothed. Color ranges from pale brown or buff to light yellow , or even orange to brown with gray areas of local reduction. The decorated forms found within the project area are limited to redslipped forms though elsewhere in the Mississippi Valley and at later times several forms of incised, engraved, punctated, and effigy pottery appears.

Plain shell tempered pottery is classified as Mississippi Plain according to Phillips (1970). In this geographical area the variety is Neeley's Ferry Plain.

When a sherd was noticed as having a red slip it was carefully washed so that it would not be further eroded. An occasional sherd would have a side which had been highly oxidized (such as in a clean hot fire) appearing orange or red brown similar to a hematite slip. In these cases, magnification was used to determine if the coloration was due to oxidation of naturally occurring iron in the clay or a true pigmented clay slip layer.

The two decorated types within the shell tempered pottery recovered in the project are interrelated: Old Town Red Filmed and Varney Red Filmed. Phillips' (1970) taxonomy arranges Varney Red Filmed as a <u>variety</u> of the main pottery type, Old Town Red Filmed. Both resulted from the application previous to firing of a powdered hematite and clay slip mixture to the still green (unfired) vessel's surface. The hematite serves to pigment the watery, fine clay solution so that it oxidizes to a bright red during the firing process. Old Town Red Filmed is chronologically later than Varney Red Filmed. The former appears on both the utilitarian Neeley's Ferry coarser shell ware and the ceremonial Bell ware with its more finely ground shell temper. Also, Old Town Red Filmed is more commonly applied to a vessel's exterior surface than the interior one. Varney Red Filmed is generally associated with Early Mississippian cultures such as the Big Lake Phase in Northeast Arkansas and Southeast Missouri (Morse 1975). In this context it is most common on the interior surfaces of large jars and salt pans where it is probably associated with a salt procurement system. Varney Red Filmed is generally thickly applied and well polished with a burnishing stone. Varney Red Filmed jars have gracefully recurved rims while Old Town Red Filmed jar rims are vertical or slightly flared.

Red filmed body sherds are difficult to categorize between the type and variety; and, unless the Varney Red Filmed variety characteristics are obvious, the sherds must be classified as Old Town Red Filmed. However, since there is an absence of Middle and Late Mississippian pottery (i.e. incised, engraved, effigy) the few recurved jar rims and salt pan body sherds present in the assemblages indicate they are from Early Mississippian components. Almost all of the red filmed pottery is probably Varney Red Filmed.

SAND AND SHELL TEMPERED: This ware appears identical to shell tempered pottery in all respects except that a second temper consisting of coarse sand is also present. Since minor amounts of fine sand does occur naturally in some clay deposits, criteria for this type were defined on the basis of sand size and quantity. To be considered as a pottery additive, the sand had to be in significant quantities to be visible with a low power microscope. The proportion of sand was at least half or more than the amounts usually found in Barnes pottery. No experiments have been conducted to measure this percentage accurately, it is considered to be about 5-15% by weight with the shell tempering present in proportions about 10-15%. Barnes sand tempered sherds usually contain 25-33% sand. Sand in the sand/shell category also had to be coarse (0.50 - 1.0 mm), again like the Barnes ware, as such sand more efficiently reduces shrinkage rates and opens up the paste texture. The type of sand consistently observed in this category is rounded, sub-angular with a characteristically dull or frosty appearance. These sand grains have probably been subjected to both aeolian and alluvial wear over time (Saucier 1974). Sands are abundantly distributed on the old braided stream terraces east of the St. Francis and west of the Little River drainages.

During the sorting process, shell tempered sherds with a slightly gritty feel were examined under magnification to determine if enough larger sand grains were present to justify the classification sand/shell. None of these sherds was cordmarked though several had red film applications. No pottery types have been defined in this geographical area for plain or decorated pottery made with this composition of paste.

SAND TEMPERED: Sand tempered pottery in this area is diagnostic for the Late Woodland Barnes phase culture. Local backswamp clay is tempered with coarse sand in relatively large proportions as described in the preceding section on sand/shell pottery. The sherds of this ware were divided almost exclusively between plain and cordmarked surface treatments. A cordwrapped paddle is thought to have been used to help form the vessel. Sherds range in color from medium brown to dark gray brown.

Most of Barnes vessels are apparently large and medium cooking jars with conical bases. A very few bowls are represented by rim sherds and were usually plain. Jars seem to have been either completely cordmarked or cordmarked in the central two thirds of the vessel with the upper area with rim and

the base smoothed plain. It is estimated that the jars range in capacity from about 10 to 15 liters. Interior surfaces were generally well smoothed and blackened; a few exhibited carbonized encrustations on the interior surfaces. Wall thickness ranges for jars are as follows: lip and rim 4-6 mm; body 5-9 mm; and base 8-13 mm.

The two main pottery types are Plain and Barnes Cordmarked. Small and highly eroded Barnes sherds were common and may have at one time been visibly cordmarked. The two types are also interconnected since they can both appear on the same vessel.

SAND AND GROG TEMPERED: Very few sherds of this ware were recognized. The paste is a combination of the Barnes and grog wares. No pottery types for this paste have been defined.

GROG TEMPERED: Pottery tempered with grog (crushed potsherds or fired clay) is generally associated with the Baytown culture of the Late Woodland period. Only a very few grog tempered sherds were found during the project survey. For a thorough discussion of Barnes and Baytown population distribution see Morse and Morse (1983).

Grog tempered sherds are most often lighter in color (light to medium gray browns predominate) and without the 'gritty' texture of sand tempered wares. Grog particles are usually irregular in shape and range in size from 1.0 - 3.0 mm. Often they are difficult to discern if their color is similar to the main paste body. Wall thicknesses are slightly thinner than Barnes and range from 4-7 mm. Surface treatment can be plain or cordmarked. Baytown Plain and Mulberry Creek cordmarked are the respective pottery types.

FIRED CLAY: Very common throughout most sites containing any ceramics are fragments of fired clay. Often eroded and irregular, they have been divided into two categories: fired clay with sand and fired clay without sand. If the sand content was greater than that which would occur naturally, fragments were classified as fired clay w/sand. Such sand was often identical to the tempering in Barnes pottery but sometimes it was finer, 1 mm or less.

Fired clay w/sand ranges in color from dark brown to orange brown. Fired clay w/o sand was more often a light to medium brown. Fired clay fragments could come from a variety of sources including hearths, hearth supports, and pottery manufacturing by-products.

HISTORIC ARTIFACTS

The majority of the historic artifact categories are self explanatory. Definitions and interpretations of the diagnostic types are presented with the Historic Sites and Artifacts in Chapter 7.

ARTIFACT AND COLLECTIONS CURATION

The artifacts and records generated from this project will be curated with the Arkansas Archeological Survey at the Jonesboro Station. This includes all cultural materials, all analysis forms, all field notes and maps, etc. Table 2 lists the accession numbers assigned to collections from the sites indicated. These accession numbers precede the Field Specimen Numbers (FSN's) referred to in this text, tables, and figures.

Table 2. Accession Numbers Assigned to Project Site Collections.

State Site Number	Accession Number
3MS519	86-921
3MS490	86-922
3MS492	86-923
Site 6	86-924
3MS41	86-925
3MS479	86-926
3MS480	86-927
Site 10	86-928
3MS481	86-929
3MS493	86-930
3MS482	86-931
3MS494	86-932
3MS510	86-933
3MS511	86-934
3MS516	86-935
3MS487	86-936
3MS512	86-937
3MS495	86-938
3MS513	86-939
3MS514	86-940
3MS496	86-941
3MS483	86-942
3MS93	86-943
3MS43	86-944
3MS497W	86-945
3MS515	86-946
3MS497	86-947
3PO499	86-948
3PO500	86-949
3PO501	86-950
3CG914	86-951
3PO496	86-952
3CG917	86-953
3CG918	86-954

State Site Number	Accession Number
3MS498	86-955
3MS517	86-956
Site 46	86-957
3MS211	86-958
Site 48	86-959
3MS501	86-960
3MS502	86-961, 86-963
3MS503	86-962
3MS484	86-964
3MS485	86-965
3MS518	86-966
3MS504	86-967
Site 59	86-968
Site 60	86-969
3MS505	86-970
Site 63	86-971
3MS506	86-972
3MS522	86-973
3PO497	86-974
3PO498	86-975
3MS507	86-976
3MS508	86-977
3MS509	86-978
3MS499	86-989
3MS500	86-990
3CG915	86-991

Chapter 7

SITE DESCRIPTIONS

by

Carol S. Spears and Robert A. Taylor

INTRODUCTION

Sixty-six new archeological sites were identified during this project and four previously recorded sites were revisited . Initial site testing was performed at about half of the sites. Descriptions of the archeological investigations at each site are presented in this chapter. The sites are grouped under six sections: (1) Sites Recommended for Testing, (2) Buried Sites, Recommended for Testing, (3) Isolated Finds, (4) Redeposited and Plowzone Sites, (5) Sites Located Outside the Project, and (6) Historic Sites and Artifacts. Diagnostic artifacts mentioned in these descriptions are further described in Appendix C, and selected artifacts are shown in Appendix D. Long tables listing the artifacts collected in the controlled surface collections are presented in Appendix E.

PREHISTORIC SITES RECOMMENDED FOR TESTING

The Hutton Site (3MS41)

Description

The Hutton Site (3MS41) was first recorded by the Arkansas Archeological Survey in 1967. At that time an amateur archeologist, R. W. Lyerly, reported on the Site Survey form:

> Site debris found on point of a ridge and its northern slope to the drainage ditch. The debris concentrated on the point. There probably was a small Woodland and Mississippi village at this spot.

Lyerly also reported that the prehistoric components may have been disturbed by an old homestead which had been located on the site, and that lots of material, including skeletons, had been excavated in the 1920s.

During SPEARS initial survey of Ditch 13, in July, 1986, a concentration of sand tempered and shell tempered sherds and a few lithics were observed in the vicinity where Lyerly had reported the skeletons. Surface visibility was limited by weeds and grass on one portion of the site and by recent cultivation elsewhere, and no artifacts were collected during this initial visit.

The site was revisited by SPEARS in August, at which time limited subsurface investigations were conducted. Surface visibility remained poor at that time, and again no surface collections were made. The site was visited a third time by SPEARS in December. Surface visibility was much improved and controlled surface collections were made.

Surface Collections

At the time of SPEARS third visit to 3MS41, most of the site had good visibility. The beans and cotton on the site had been partly harvested, weeds along Ditch 13 had been replaced by winter wheat, and all of the site had been rained on. Visibility in the wheat was about 20%, in the disked bean field about 98%, and in the cotton field about 90%.

Three rows of 4 m x 4 m collection units were established (Figure 3). Row A was oriented east-west in the disked field parallel to the south edge of the wheat and contained 25 collection units. Because visibility in the wheat was poor, no extensive surface collection was attempted there, although earlier observations had indicated that the site continued northward beyond Row A toward Ditch 13.

Row B was oriented almost perpendicular to Row A. Row B was 50 units long (200 m). It extended 16 m north of Row A into the wheat field, where visibility was relatively poor, and extended south across a disked area and into the cotton field, where visibility was excellent.

Row C was located in the cotton field, perpendicular to Row B, and was 25 units (100 m) long. Row C crossed Row B and extended 72 m east of Row B to near the eastern edge of the observed artifact distribution. Unit C7 was the same collection unit as unit B32, and unit A20 was the same unit as B5. Therefore units A20 and B32 are omitted from Tables 78 and 79.

More than 4,200 artifacts were collected in the controlled surface collections. Almost half of these were historic artifacts, and about half were prehistoric ceramics. About 200 lithic artifacts were collected (Table E2). In the lithic assemblage, 160 specimens were unmodified stone; and this category includes: fragments of limestone, which are almost certainly modern agricultural limestone; pebbles, which were probably deposited both historically and prehistorically; and fragments of historic slate. Other slate fragments are included in the total for historic artifacts.

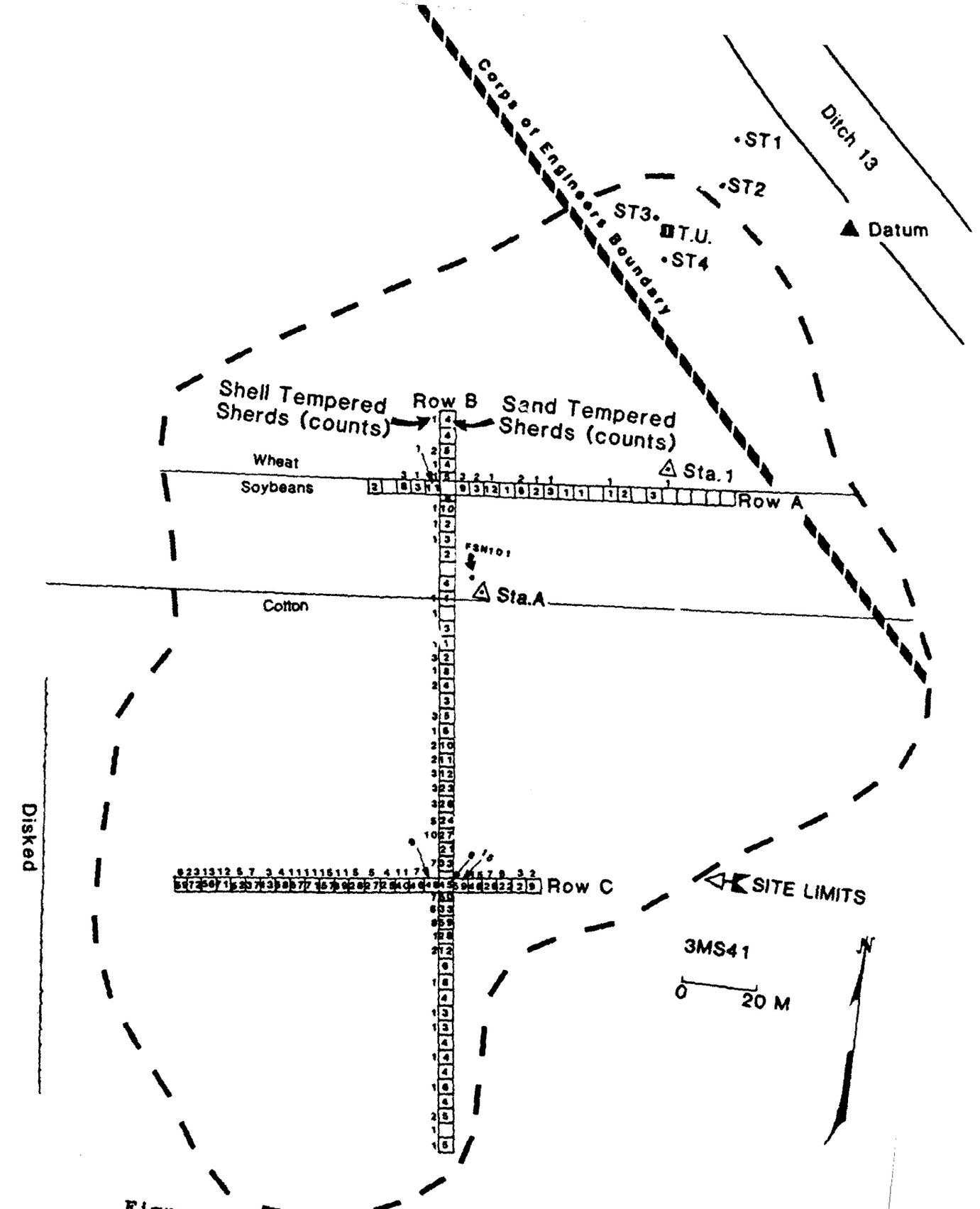


Figure 3. Site Map of 3MS41 Showing the Distribution of Ceramics in the Controlled Surface Collections.

Lithic Tools

Lithic tools found in the controlled surface collections are described in Appendix C, and listed in Appendix E, Table E2. Some are shown in photographs in Appendix D. These included six hammerstones (Plate 6a, 6b, 6c), three cores (Plate 4f), one microblade (Plate 3a), two sandstone abraders (Plate 6d), 1 steep uniface, 3 utilized flakes, 1 tested cobble with one flake removed, and 1 small fragment of polished stone. Although these artifacts are mostly not assignable to a specific cultural period, they are functionally diagnostic. The hammerstones and cores represent a lithic reduction technology, the polished stone probably represents ideological behavior, and the sandstone abraders probably functioned in the manufacture and maintenance of bone tools. In addition, the three cores were found in adjacent collection units and may indicate a functionally discrete area within the site.

Ceramics

Most of the prehistoric ceramics were Woodland period sand tempered (1,685); and, of these, over 950 were plain, about 740 were cordmarked, around 30 were red slipped, and 1 was check stamped (Table E1). Three sherds with grog temper and one with sand and grog temper also belong to the Woodland component. The grog tempered sherds were plain, and the sand and grog tempered sherd was check stamped. Two other Woodland sherds were apparently reused by later Mississippian peoples; one as an abrader and the other as a discoidal.

The shell tempered sherds and sherds with a combination of sand and shell tempering are attributed to a Mississippian component. Over 300 have shell tempering and less than 20 have a combination of sand and shell (Table E1). All of the sherds with a combination of tempering are plain. Of those containing only shell tempering, 271 are plain, 32 are red filmed on one or both surfaces, and 1 is painted red on white.

Although Woodland ceramics occurred in higher densities everywhere on the site, the highest densities of both Woodland and Mississippian ceramics co-occurred on the highest part of the natural levee, in the southwest quadrant of the mapped distribution (Figure 3). It is likely that the high observed density may be partly a function of erosion and other site disturbances, although no subsurface units were excavated in that area of the site to confirm such a hypothesis. The highest density of historic artifacts also occurred in the same area as the highest prehistoric artifact density, and both occurred in an "area of concentration" mapped by Lyerly when the site was first recorded. An intact buried midden observed in another part of the site at a lower elevation may be eroded and mixed on the higher elevation by modern farming activities.

Shovel Tests

Four shovel tests were excavated at 3MS41 (Figure 3). All of these were near Ditch 13 at the north end of the site. No subsurface tests were conducted elsewhere on the site because the crops had not been harvested. No artifacts were found in Shovel Tests 1 and 2, but artifacts and an intact, buried midden were found in Shovel Tests 3 and 4.

Shovel Test 1

Shovel Test 1 was located nearest Ditch 13 on what appeared to be spoil from previous ditch excavations. From 10 to 40 cm below the surface were various lenses of obvious spoil. From 40 to 60 cm was a homogeneous, compact, brown loam. No artifacts were found in Shovel Test 1, although an eroded shell tempered sherd was observed on the surface of the spoil three meters south of the shovel test.

Shovel Test 2

Shovel Test 2 was located farther from Ditch 13 and 18 m south of Shovel Test 1. From 0 to 30 cm was the same homogeneous sandy loam recognized at 40 to 60 cm in Shovel Test 1. From 30 to 40 cm was a medium sand with mineral precipitates, and from 40 to 80 cm was a finer sand becoming mottled near 80 cm. None of these strata appeared to be cultural and no artifacts were found in Shovel Test 2. The stratum between 30 and 40 cm was examined by Dr. John Dixon, the project geomorphologist, who identified the mineral precipitates as transported and eroded charcoal deposited in channel sands. The sediments in Shovel Tests 1 and 2, then, appear to be fill in an old channel.

Shovel Test 3

Shovel Test 3 was located 19 m southwest of Shovel Test 2. From 0 to 20 cm was a compact, fine sandy loam with no artifacts. From 20 to 45 cm was a mottled silt loam containing both sand tempered and shell tempered sherds (Table 3). This stratum appeared to be an intact midden, and Shovel Test 3 was unexcavated below 45 cm.

Shovel Test 4

Shovel Test 4 was located about 10 m south of Shovel Test 3. It was excavated only deep enough (25 cm) to verify that the intact midden was present below the plowzone. Test Unit 1 was then positioned between Shovel Tests 3 and 4 to sample the midden.

Table 3. Artifacts Collected in Subsurface Units at 3MS41.

Abbreviations Used: Ceramics are identified by temper. PL=Plain; RF=Red Filmed; CDM=Cordmarked; FC=Fired Clay; P=Ceramic Particles; SFLK=Secondary Flake; FCR=Fire Cracked Rock.

FSN	LOCATION	SHELL		SAND		FC	P	B	SFLK	FCR	TOTAL
		PL	RF	PL	CDM						
1	ST3 0-50				1	X					1
2	ST3 50		1		2						3
3	ST4 35			1	1						2
4	TU1 0-10	1		4	7	X	X				12
5	TU1 10-17	6		4	13	X	X	X		1	24
6	TU1 17-27	11	19		29	X	X	X	1		60
	TOTAL	18	20	9	53				1	1	102

Test Unit 1

Test Unit 1 was a 1 m x 1 m excavation unit located 3 m south of Shovel Test 3 (Figure 3). It was intended to sample the intact midden identified in Shovel Tests 3 and 4.

The plowzone in Test Unit 1 was 15 to 17 cm deep. At the base of the plowzone was a dark, mottled silt loam containing fired clay and sherds. Excavation of the intact level below the plowzone had just begun when a human bone, tentatively identified as a femur, was encountered near the center of the unit. Only the southeast quarter of Test Unit 1 was excavated below the plowzone, and only to 27 cm below the surface. No pit outline or other feature was observed. The portion of the femur protruding above 27 cm was cleaned and photographed, then left in situ and reburied with the soil which had been excavated near it. The sponsoring agency was immediately notified of the presence of human remains and SPEARS recommended that the skeletal remains exposed be excavated as soon as possible and analyzed by a physical anthropologist. Exhuming this skeleton was beyond the scope of this project.

Several sherds were found in the small portion of the intact stratum which was excavated, and this zone appeared to be a rich cultural midden (Table 3). Other burials are probably located near Test Unit 1 also, since this is the portion of the site where Lyerly has reported that burials were found in the 1920s.

The high proportion of red filmed sherds in the intact midden (Table 3) contrasts noticeably with the low percentage on the surface. These sherds may represent an Early Mississippian component in this portion of the site which is distinct from and earlier than the Mississippian component represented in the surface collections.

Alternatively, the high percentage of red filming in Test Unit 1 may be a factor of better preservation below the plowzone than on the surface, and only one Mississippian component may be present at the site. The Woodland sherds below the plowzone in Test Unit 1 are also exclusively cordmarked, in contrast to the lower percentage of cordmarking on the surface, and this supports the hypothesis that sherds on the surface have been eroded, significantly reducing the percentages of decorated specimens.

Summary

Controlled surface collections indicated that at least one historic and two prehistoric components are present at 3MS41. The collections also demonstrated that the highest surface densities of artifacts of all three components are located on the highest part of a natural levee toward the southwest quarter of the site. However, subsurface tests and a previous site description indicate that a significant portion of the site, including an intact midden and human burials, is located in close proximity to and perhaps intersected by Ditch 13. In addition, differences in the percentages of red filmed shell tempered ceramics and cordmarked sand tempered ceramics were noted between the surface collections and the test excavations. These differences are tentatively attributed to differential preservation on the surface and in the intact subsurface deposits, although it is possible that the differences may reflect additional Mississippian and Woodland components present in the intact midden but not represented in the surface collections.

Although the controlled surface collections give an adequate picture of the surface artifact distribution and densities, it is very likely that the limits of the intact subsurface deposits do not conform to the surface distributions. Neither the vertical nor the horizontal boundaries of the intact midden have been defined. The high artifact density and the presence of burials suggest an intensive permanent occupation of the site. It is likely that features such as house floors and storage pits are preserved.

Significance

SPEARS investigations at 3MS41 revealed a large, multicomponent site with intact subsurface deposits and human burials. It is also likely that other kinds of domestic features, such as house floors and storage pits, are preserved at the site, although none was detected during the limited investigations conducted thus far. The site has a very high

potential for containing data pertinent to several significant research questions. It is likely that data on seasonality, settlement pattern, ceramic and lithic technologies, and human biology are present in both Mississippian and Woodland contexts; and that, additionally, the relationships between Mississippian and Woodland subsistence and social systems can be investigated with data from the site. The historic artifacts may also provide information on late nineteenth and early twentieth century domestic activities in the lowlands of northeast Arkansas.

Recommendations

Additional subsurface investigations should be conducted at 3MS41 to establish the boundaries and nature of the buried, intact midden and to gather data necessary to nominate the site to the National Register of Historic Places. Due to the presence of human skeletal remains in close proximity to Ditch 13, consideration should be given to avoiding any impact on the site that might result from proposed ditch cleanout operations. Additional subsurface investigations are also necessary to assess potential impacts and to recommend specific alternative ditch locations or protective measures.

3MS93

Site 3MS93 was first reported to the Arkansas Archeological Survey in 1973, and limited investigations undertaken at that time resulted in the description of a large site with intact features dating to the Woodland and Mississippian periods. Recommendations for further investigations were made by the Arkansas Archeological Survey, but these investigations were not undertaken and later ditch construction had a significant impact on the site. The site was reported to be bulldozed away in 1975, and fill from a portion of the site had been used in nearby bridge construction.

The site was again investigated in 1979 by Iroquois Research Institute (1980a) in connection with the construction of a control structure on Ditch 81. At that time lateral migration of Ditch 81 and streambank erosion had continued to destroy portions of the site in the interval since 1975. Iroquois Research Institute examined the site in order to assess the impact of the imminent control structure construction.

Their investigations included surface transects with shovel tests, two test units, and bank profiles. Artifacts observed in the surface transects were counted but not collected (Iroquois Research Institute 1980a:33). The test units were 1 m x 2 m in the upper levels and 1 m x 1 m in lower levels.

As a result of their investigations, Iroquois Research Institute (1980a:39) reported:

> During Iroquois Research Institute's examination of 3MS93, prehistoric and historic materials were observed over a very large area including the fields on both sides of the ditch, the test pits and the ditch channel. Based on controlled observations, the site size is estimated to be approximately 22.8 hectares (57 acres). The area which has been either destroyed by channel excavation or buried beneath the spoil banks is estimated to be approximately 4.9 hectares (12 acres). The larger portion of the site is on the right descending bank of the ditch. Repeated cultivation of the area has no doubt increased the apparent surficial extent of the site.

Besides a variety of Woodland and Mississippian artifacts, the researchers also identified intact cultural features including "a hearth, a pit, a sherd concentration and several areas of concentrated midden" (Iroquois Research Institute 1980a:66). These features contained artifacts, charcoal, faunal remains, and human skeletal materials.

The features were associated with Late Woodland, Early Mississippian, and Middle Mississippian components at the site (Iroquois Research Institute 1980a:71). Iroquois Research Institute (1980a:72) recommended that the Corps of Engineers seek a determination of eligibility and concluded that the overall effect of the proposed control structure would be to preserve the site.

SPEARS visited 3MS93 in July, 1986. Only the portion of the site west of the Little River Floodway levee was within the scope of the investigations undertaken by SPEARS. Since the significance of the site and its cultural affiliation had already been assessed, SPEARS made no controlled collections and conducted no subsurface tests. Two lithic artifacts were collected which are listed in Table 4. The micro core (FSN 1-1) is shown in Plate 5f.

Table 4. Lithics Collected From the Surface of 3MS93.

FSN	LOCATION	DESCRIPTION
1	50 m west of levee 56 m south of ditch	1 micro-core, 1 tested cobble

Both historic and prehistoric artifacts were observed widely scattered up to 100 meters west of the levee and extending north-south along the levee about 300 meters. These observations

generally agreed with the distributions earlier mapped by Iroquois Research Institute, although the current dimensions of the artifact scatter may be slightly greater than in 1979, probably due to continued cultivation. Some artifacts, however, appeared to occur in discrete clusters, even at the edges of the surface distribution, and may represent subsurface features or middens recently disturbed by agricultural activities.

Recommendations

Although Iroquois Research Institute concluded that the control structure would have no adverse effect on 3MS93, the presently proposed improvements to Ditch 7 impose a new threat to the integrity of the site. The largest intact portion of the site, on the right descending bank of Ditch 81, would be adversely impacted by any new construction.

SPEARS concurs with Iroquois Research Institute that the Corps of Engineers should seek a determination of eligibility for inclusion of 3MS93 in the National Register of Historic Places and that an adequate preservation plan for the site be developed. The impact of proposed Ditch 7 improvements should be mitigated by data recovery through excavation, or the site should be completely avoided by the proposed project.

3MS493

Description

3MS493 is a large multi-component site which contained artifacts dating from the Late Woodland through the Early and Middle Mississippian Periods. Two distinct clusters of material measuring 80 m in diameter were observed on the surface of the site. These areas (A and B) were separated by a low lying swamp or drainage. Archeological investigations included 42 controlled surface collections, one test unit, one controlled column, and a few shovel tests (Figure 4).

Surface Collections

Mapped Specimens

When 3MS493 was first discovered the soybean crop was young and surface visibility was good. The spoil had been recently tilled and rained on and surface visibility was excellent. Only one flake (FSN 6-1) and one sand/shell tempered sherd (FSN 7) were found on the spoil near the ditch. The flake has been utilized and it is composed of Crowley's Ridge chert. The highest density of artifacts was observed in the field and the site may be buried under the spoil. Artifacts collected during site discovery are listed in Table 5. The pottery disk made on a Barnes Cordmarked sherd is 2.4 cm in diameter and 7 mm thick. FSN 5-1 is a utilized flake composed of Burlington-like chert.

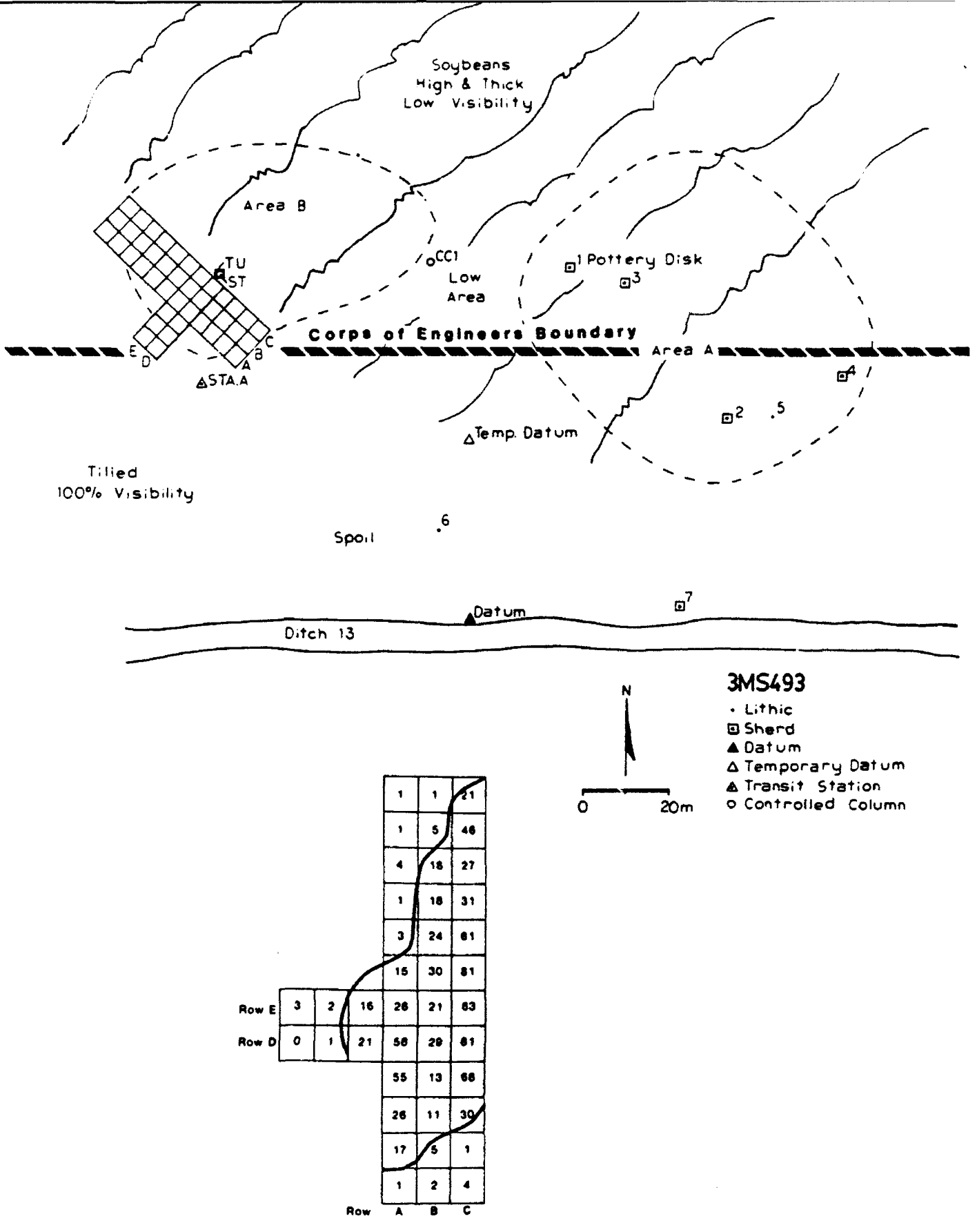


Figure 4. Site Map of 3MS493 and Artifact Counts in the Controlled Surface Collections.

Table 5. Artifacts Collected on the Surface of 3MS493.

LOCATION FSN	UTILIZED FLAKE	SAND/SHELL	SAND PL CDM	TOTAL
1			1 disk	1
2			1	1
3		1		1
4		1		1
5	1			1
6	1			1
7		1		1
TOTAL	2	3	2	7

Controlled Surface Collections

During initial site testing, 42 controlled surface units (4 m x 4 m) were collected. These had to be positioned within the tilled portion of the site (Area B) because there was no visibility in the soybean field (Area A). These collections served primarily as a sample from the surface, to estimate artifact densities, and to assist in defining site boundaries in this area. The artifacts collected are listed in Tables E4 and E5.

The artifact frequencies are shown in Figure 4, where counts over 10 have been enclosed by a dark line. The higher densities of ceramics were collected on the east side of the grid toward the soybean field, indicating that the center of the site is probably north in the soybean field. Test Unit 1 was placed east of units containing the highest frequencies of artifacts and on the edge of the field. Additional plots of the artifacts were made, but no spatially or temporally distinct areas were observed. In general, the higher densities of sand tempered sherds were positively correlated with the higher densities of shell tempered sherds and vice versa. Four units with 10 or more shell tempered sherds were found separated by units with lower densities of shell tempered sherds. This pattern may correlate with features such as house areas or refuse pits. The few lithics were found over a widely dispersed area and no patterning was evident.

Lithic tools were collected in the controlled surface collections. In A1 (FSN 54-2) there was a cobble which had been used as both an anvil and a hammer. FSN 39-6 is a bifacially flaked adz-like scraper with reuse and polish. It was found in C10. FSN 48-6 is another small bifacially flaked adz made from a Crowley's Ridge chert pebble (Plate 5a). It was found in B6. In B7 there was one tiny biface fragment (FSN 47-1) composed of Crowley's Ridge chert.

Subsurface Tests

Controlled Column 1

Controlled Column 1 was positioned between the two artifact clusters. The area was low lying and portions remained water saturated. The sediments in this test were excavated in four 10 cm levels and all soil was screened. One small sherd was found in the top level and no material was found below. Sediments consisted of alternating lenses of sand and cannel coal. A soil core was used to examine sediments to about 125 cm below the surface where they continued to be waterlain and banded. Based on the excavation of this one subsurface test between the two clusters of surface material, this low lying area is interpreted as the location of a former channel. The antiquity of the watercourse is unknown.

Test Unit 1

From 0-10 cm was an upper disturbed plowzone level containing a very high frequency of small sherds. At 10 cm a very mottled sediment with larger sherds was evident. Plowscars running east-west through the unit were excavated and soil was screened with the plowzone. Artifacts collected in this test unit are listed in Tables 6 and 7.

Table 6. Ceramics Collected in Test Unit 1, 3MS493.

Abbreviations Used: Ceramics are listed by tempers. PL=Plain; OTR=Old Town Red; VR=Varney Red; CDM=Cordmarked; FC=Fired Clay; P=Ceramic Particles.

LOCATION	SHELL			SAND/SHELL	SAND		SAND/GROG		GROG	FC	P	TOTAL
	PL	OTR	VR		PL	CDM	PL	CDM				
0-10	16	1			71	49				X	X	137
10-20	3				34	29				X	X	66
20-30	1				12	19				X	X	32
30-40				1	3	7				X		11
40-50							2	3		X		5
50-60	1											1
60-70												0
70-80												0
TOTAL	21	1		1	120	104	2	3		X	X	252

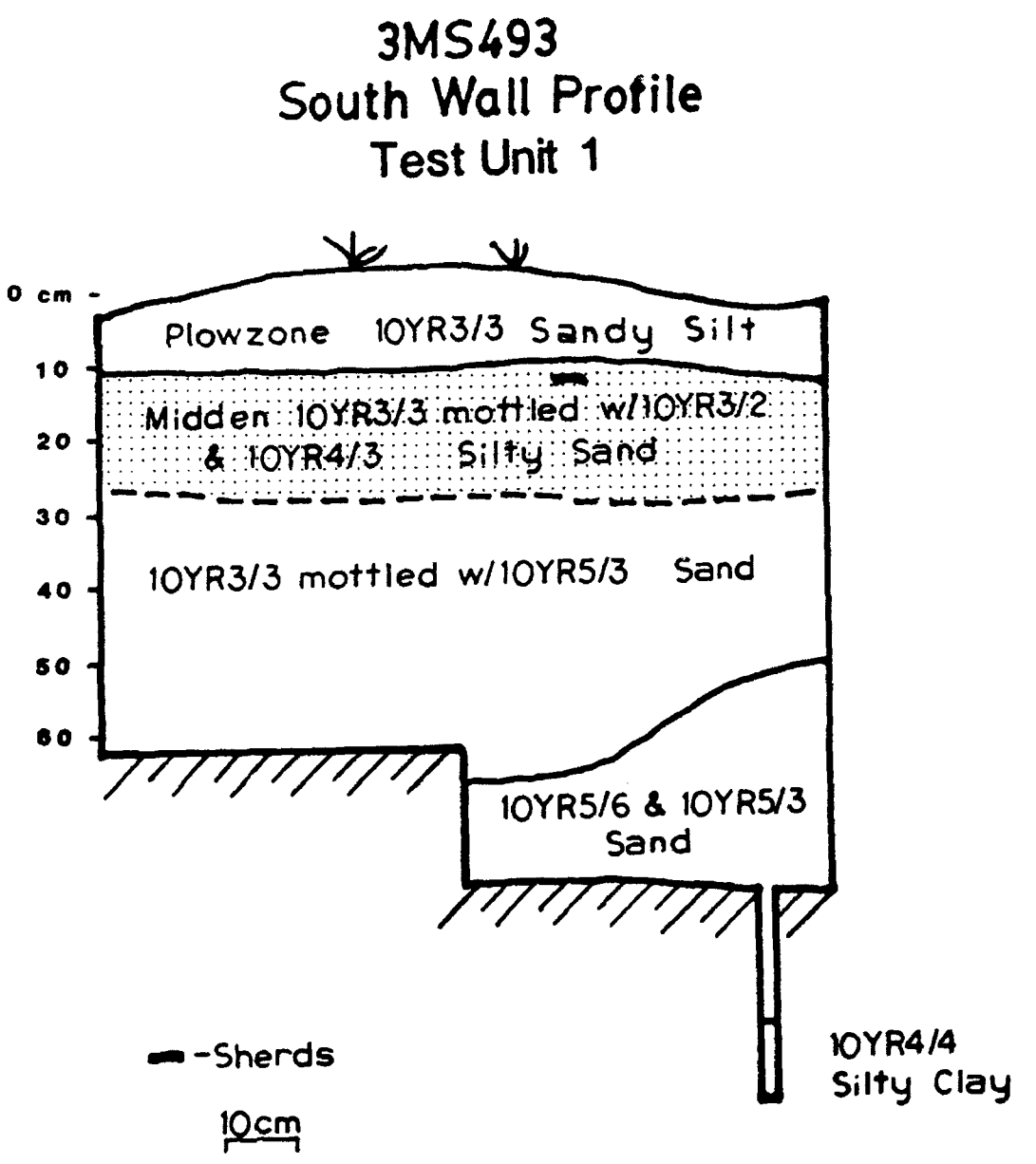


Figure 5. Profile of Test Unit 1, 3MS493.

Table 7. Lithics Collected in Test Unit 1, 3MS493.

ABBREVIATIONS USED: PP=Projectile Point/knife; O=Other tool; PRE=Preform; DR=Drill; UF=Utilized Flake; B=Biface; H=Hammerstone; C=CORES; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; PF= Pressure Flake; FCR=Fire Cracked Rock; UNMOD=Unmodified Cobbles, Stones or Angular Fragments.

UNIT	PP	O	PRE	DR	UF	B	H	C	PFLK	SFLK	IFLK	FCR	PF	UNMOD	TOTAL
0-10									1			1			2
10-20					1					1					2
20-30					1										1
40-50										1					1
TOTAL					2				1	2		1			6

An intact cultural level began just below the plowzone. From 10-20 cm fewer sherds were collected; however, on the whole the sherds were larger in size and weight. Mean weights of the sherds by level are presented in Table 8. One utilized flake (FSN 9-6) was collected from 10-20 cm and one from 20-30 cm (FSN 10-8). Both of these artifacts are composed of Crowley's Ridge chert. The cultural level continued to about 30 cm where the sediments contained lighter mottles and fewer artifacts. Below this level the soil changed to a homogeneous gray sand. The last whole level was excavated to 60 cm below the surface and the southwest corner was terminated at 80 cm. The South Wall Profile is shown in Figure 5.

Table 8. Mean Ceramic Weights (grams) by Level in Test Unit 1, 3MS493.

Abbreviations Used: Ceramics are listed by tempers. PL=Plain; OTR=Old Town Red; VR=Varney Red; CDM=Cordmarked; FC=Fired Clay; FCS=Fired Clay with Sand.

LOCATION	SHELL			SAND/SHELL	SAND		SAND/GROG		FC	FCS
	PL	OTR	VR		PL	CDM	PL	CDM		
0-10	1.6	3.8			1.8	4.5			1.6	1.0
10-20	4.8				3.2	5.9			2.9	
20-30	2.1				2.3	3.3			1.5	2.0
30-40				1.0	1.0	4.4				.9
40-50					7.0	2.8				

Significance and Recommendations

No feature stains or artifact clusters were observed in the test unit; however, there is a possibility that features remain within the subsurface deposits in other areas of the site. Test Unit 1 also contained stratified cultural levels. In this unit the Mississippian components represented by shell tempered pottery were found almost exclusively in the upper disturbed level. The intact deposits date to the Late Woodland as indicated by Barnes plain and cordmarked pottery collected from the midden. Due to the high research value of the intact deposits and the relatively high density of material on the surface of 3MS493, the site is eligible for nomination to the National Register. Further testing to determine site boundaries and to collect additional information on the deposits is recommended.

3MS494

Description

During SPEARS initial survey of Ditch 7, a single pitted cobble/hammerstone (FSN 1-1) (Plate 7b) was found in a road near a bridge. Although visibility was good nearby, no other artifacts were observed, and the artifact was recorded as an isolated find. Visibility on the opposite (south) side of the ditch was impaired by a dusty, dry cultivated field.

Table 9. Lithic Artifacts Collected at 3MS494.

FSN	LOCATION	DESCRIPTION
1-1	North of ditch	Pitted hammerstone
4-5	mapped	Utilized flake of secondary decortication

When the south side of the ditch was reinvestigated after a rain, a light to moderate density of both prehistoric and historic artifacts was observed in a field near the bridge (Figure 6). Since this discovery was made on the last scheduled day of fieldwork, no controlled collections and no subsurface tests were conducted. The site limits were estimated from the artifact scatter which terminated abruptly at the edge of the ditch spoil, indicating that part of the site was buried beneath the spoil. The portion of the site not buried by spoil measured about 120 m x 90 m including the historic component, which occurred only at the western edge of the prehistoric artifact distribution.

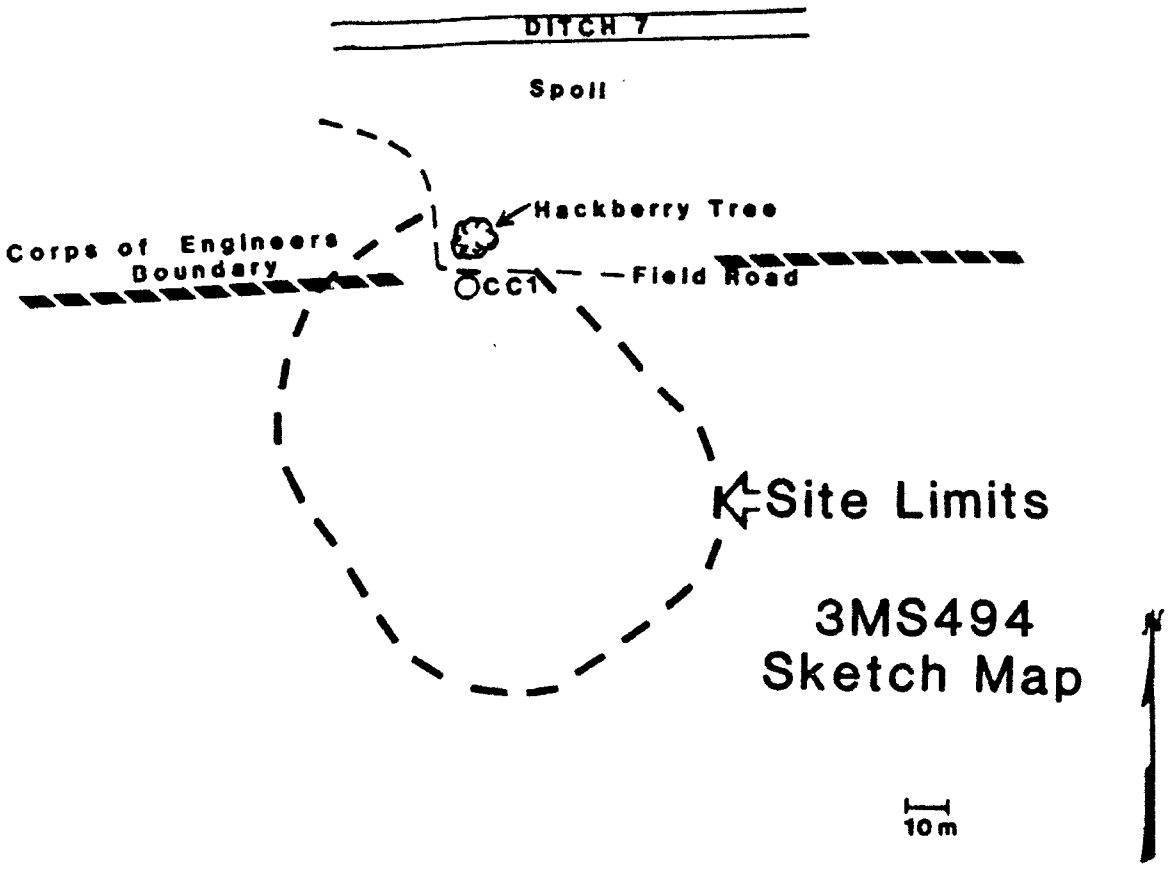


Figure 6. Site Sketch Map, 3MS494.

All of the observed historic artifacts dated to the mid-twentieth century, and did not appear to be culturally significant. The prehistoric artifacts, however, included both sand tempered and shell tempered ceramics, indicating Woodland and Mississippian components. In addition, a local informant reported that three mounds had once been located within a quarter mile of this site.

To further define the nature of the site, it was revisited a third time, in February, 1987. At that time visibility was about 90% in the harvested cotton field, and artifacts were flagged in order to check the earlier observations on site size. Fewer artifacts were observed than on the previous visit, but the site dimensions were apparently the same as the earlier observations. Fifteen sherds and a fragment of fired clay were collected outside the project corridor (Table 10).

Controlled Column 1

To investigate the possibility that part of the site was buried beneath spoil within the impact zone of the proposed ditch improvements, a 50 cm x 50 cm controlled column was excavated at the edge of the spoil where the surface artifact distribution ended, 50 meters south of Ditch 7.

Controlled Column 1 was excavated to a depth of 70 cm (Figure 7). From 0 to 20 cm was a recent plowzone which contained 12 sherds, mostly sand tempered, and fired clay (Table 10). From 20 to 35 cm, sherds, burned bone, a nutshell, wood charcoal, and a utilized flake of secondary decortication were collected. Due to the small size of the sherds and the loose nature of the sediments, this stratum was interpreted as an older plowzone. An undisturbed soil between 35 and 70 cm appeared to be an intact midden. Ten sherds, seven of which were sand tempered, and fired clay were collected from this stratum. Two additional sand tempered sherds were mapped in the wall profile of Controlled Column 1, one at 40 cm and one at 70 cm (Figure 7).

Table 10. Ceramics Collected at 3MS494.

Abbreviations Used: Ceramics are listed by tempers. PL=Plain; OTR=Old Town Red; VR=Varney Red; RS=Red Slipped; CDM=Cordmarked; FC=Fired Clay; P=Ceramic Particles.

LOCATION	SHELL				SAND/SHELL			SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC		PL	CDM					
surface	2			1	1			8	3			x	1	16
CC1 0-20	2							8	2			x		12
CC1 20-35	10				1			5				x		16
CC1 35+	3							4	3			x		10
CC1 40								1						1
CC1 70									1					1
												TOTAL		56

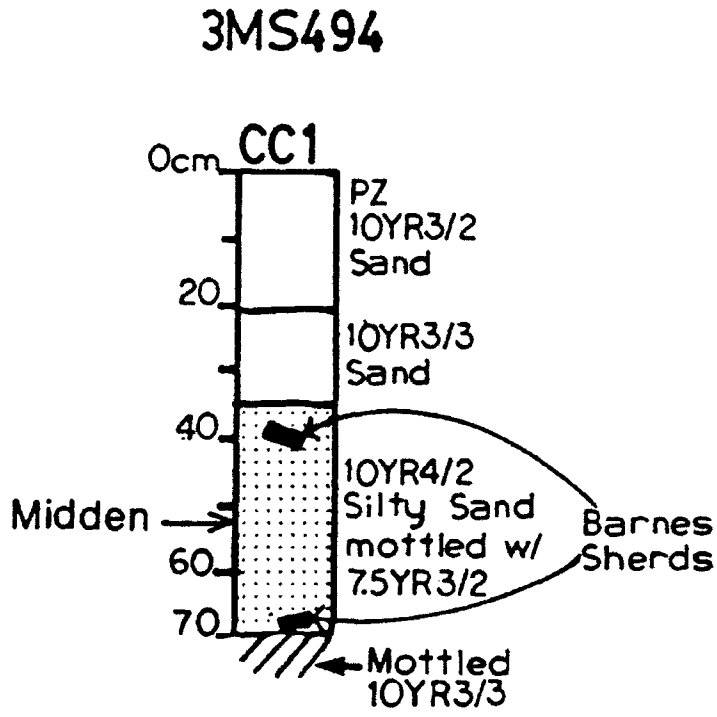


Figure 7. Profile of Controlled Column 1, 3MS494.

Significance

The historic component at 3MS494 is too recent to be significant in terms of National Register criteria and does not warrant further investigations. The prehistoric components, however, are apparently significant in terms of current research problems.

Although the sample size is small, the low frequencies of red filmed sherds and of sherds with a combination of sand and shell tempering suggest that the Mississippian component is probably Middle Mississippian. However this is only a tentative assignment. The highest frequency of shell tempered ceramics was in the old plowzone between 20 and 35 cm. This may indicate that the Mississippian component has been disturbed by past agricultural activities. However, the presence of burned bone, charred nutshells, and wood charcoal indicate that some portions of the Mississippian component may be relatively undisturbed. Pits and other features which intruded deeper levels would probably be preserved. The organic materials and the probable features may contain significant data pertinent to local and regional research in Mississippian adaptations and subsistence.

Cordmarking on the sand tempered sherds indicates that the Woodland component is probably Late Woodland. There is a higher ratio of cordmarked to plain sherds in the unit below 35 cm. The hypothesis that many plain Barnes sherds may actually be eroded cordmarked sherds was previously discussed (3MS41). The presence of cordmarked sherd below 35 cm is another indication that this stratum is undisturbed and may be an intact midden.

Recommendations

The presence of this intact midden at the edge of the surface distribution strongly suggests that part of the site is buried beneath spoil from previous Ditch 7 construction. SPEARS investigations have demonstrated that a potentially significant site, containing data relevant to contemporary research questions, is partly within the impact zone of the proposed Ditch 7 improvements. Since two plowzones overlie the intact midden, the boundaries of the site may not conform to the observed surface distribution and certainly do extend an undetermined distance beneath the Ditch 7 spoil.

For these reasons, SPEARS recommends further subsurface testing at 3MS494. This testing should, at a minimum, establish the boundaries of the buried portions of the site, determine the nature and relationship of the Woodland and Mississippian components, and collect data necessary to establish the significance of the site in relation to National Register criteria.

3MS497

Description

3MS497 was initially recorded as three sites. Daily field numbers were assigned by two survey teams to artifact scatters opposite each other on the spoil on either side of Buffalo Creek Ditch. These two scatters were later combined as Site 3MS497. A third scatter, in a cotton field, was redeposited from 3MS497 and was given the same state site number. In this discussion, the redeposited portion is discussed as 3MS497W under Redeposited and Plowzone Sites. All three of the artifact scatters in the vicinity had ultimately been derived from a single site intersected by the ditch.

3MS497 was found both on the spoil and in a bean field adjacent to the spoil. There was a higher density of artifacts on the spoil than in the field and surface collections were made in both locations. In addition, a 1 m x 1 m test unit was excavated in the field.

Surface Collections

All artifacts observed on the higher part of the spoil were collected as one provenience (FSN2). Artifacts from the lower slope of the spoil, which could have been mixed with artifacts from the original ground surface, were collected as a second provenience. One hammerstone/edge ground cobble (FSN3) (Plate 6g) was collected. Artifacts in the bean field on the original ground surface were collected from 12 4 m x 4 m controlled collection units (Table 11).

The 12 4 m x 4 m units were in a single line divided into two segments (Figure 8). This linear arrangement was selected to sample the center of the observed artifact distribution while also avoiding patches of bermuda grass where visibility was severely restricted. Overall visibility was about 55%. The segment of controlled collection units south of Test Unit 1 was labeled Row A, and the segment north of Test Unit 1 was labeled Row B. Row A contained four 4 m x 4 m units and Row B contained eight. The units in Row A were numbered A-1 through A-4 from south to north, and those in Row B were numbered B-1 through B-8 from south to north.

No artifacts were found in A-1, B-2, B-6, B-7 or B-8. The few artifacts found in the other controlled collection units and on the spoil are presented in Table 11.

In addition to these prehistoric artifacts, there was a very thin scatter of historic artifacts on the surface. These historic artifacts, mostly glass, all appeared to date to the mid-twentieth century. One fragment of brown glass was collected in A-2, and one whiteware sherd was found in A-3.

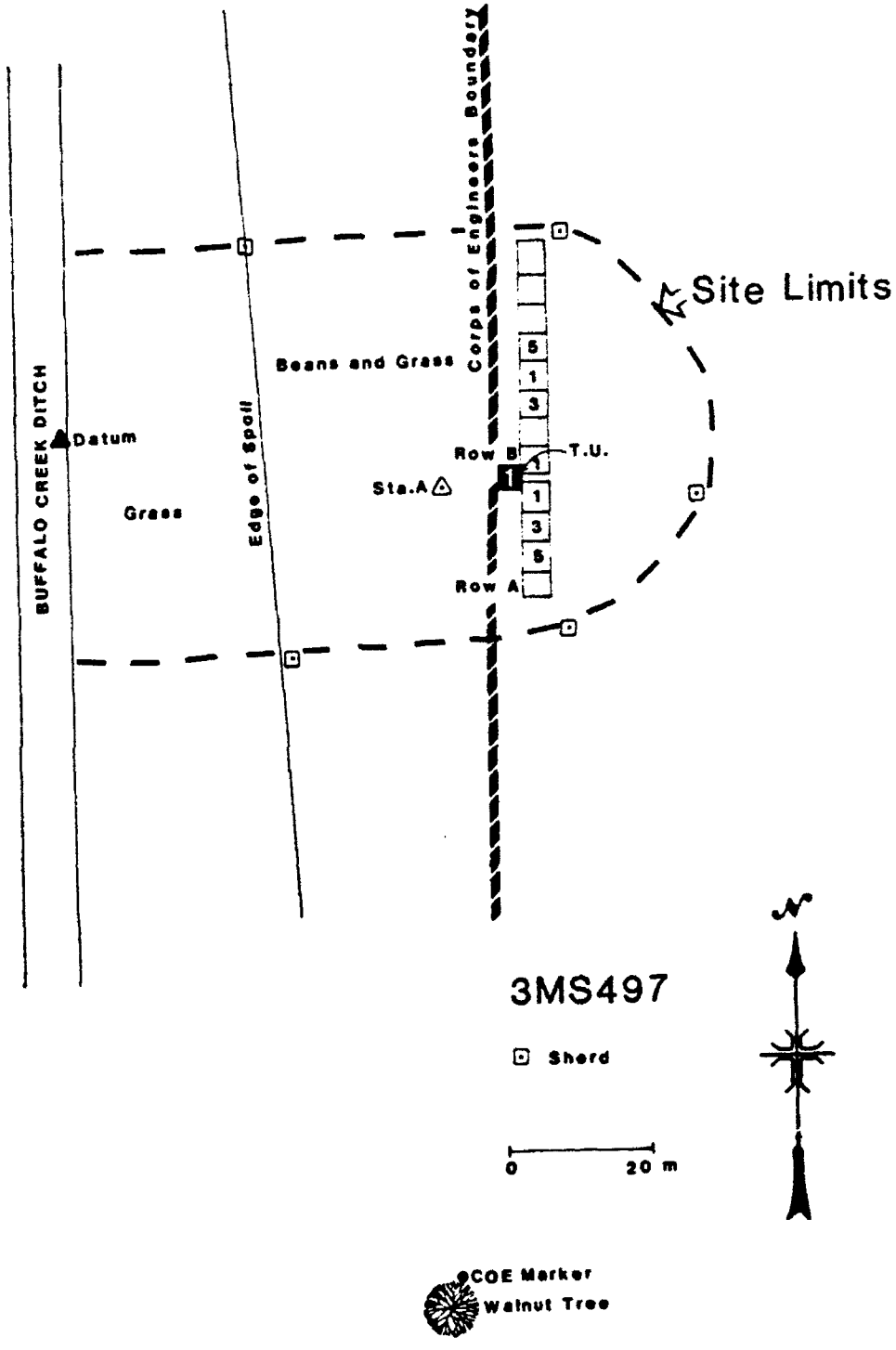


Figure 8. Site Map, 3MS497.

Table 11. Ceramics Collected at 3MS497.

Abbreviations Used: Ceramics are listed by temper. PL=Plain; VR=Varney Red Slipped; CDM=Cordmarked; FC=Fired Clay; P=Ceramic Particles.

FSN	LOCATION	SHELL		SAND		FC	P	TOTAL
		PL	VR	PL	CDM			
2	Berm,surf			8	7	1		16
3	surf			6	2			8
5	A2			3				3
6	A3			3				3
7	A4			1				1
8	B1			1			X	1
10	B3			3				3
11	B4			1				1
12	B5			1				1
16	NE most			1				1

FSN	LOCATION	SHELL			SAND		FC	P	
		PL	O	VR	PL	CDM			
17	TU1 0-10				18	1			19
18	TU1 10-20				18	1			19
19	TU1 20-30				24	9	2	X	35
20	SE most				1				1
21	TU1 30-40	7			112	53	4		176
22	TU1 40-50				16	18	1		35
23	TU1 50-60				5	6			11
24	TU1 60-70				2				2
25	TU1 27 cm					1			1
26	TU1 30 cm				1				1
27	TU1 33 cm				1				1
28	TU1 33 cm					1			1
TOTAL		7			198	90	7		302

Table 12. Lithics Collected at 3MS497.

Abbreviations Used: PP=Projectile Point; O=Other Lithic; UF=Uniface; B=Biface; H=Hammerstone; IFLK=Interior Flakes; FCR=Fire Cracked Rock; UNMOD=Unmodified Angular Fragment.

FSN	LOCATION	PP	O	UF	B	H	C	IFLK	FCR	UNMOD	TOTAL
1	Surf			1							1
2	Berm-top					1					1
3	Berm-lower		1				1				2
5	A2								1	1	2
21	TU1 30-40							1			1
23	TU1 50-60	1									1
TOTAL		1	1	1		1	1	1	1	1	8

Test Unit 1

Test Unit 1 was located near the center of the thin artifact distribution in the bean field. The plowzone was 20 cm deep and was excavated in two 10 cm levels. Each level contained 19 sand tempered sherds (Table 11). This was a higher density than expected based on the thin surface distribution. Plowscars were distinct at the base of the tilled levels, and the sediments became more compact below 20 cm.

From 20 to 30 cm, the count of sherds increased to 33, slightly above the plowzone counts, and from 30 to 40 cm a very high density of sherds was recorded. Among the 172 sherds in this latter level, 112 were plain, sand tempered; 53 were cordmarked, sand tempered; and 7 were plain, shell tempered. The density dropped in the 40 to 50 cm level, to 34 sherds, with no shell tempered sherds. From 50 to 60 cm only 11 sherds were found. Only the southeast quadrant of Test Unit 1 was excavated below 60 cm. From 60 to 70 cm, 1 sherd was found; and from 70 to 80 cm, no artifacts were recovered. In addition to these sherds, four other sand tempered sherds were mapped and collected from the south wall of Test Unit 1 between 27 and 33 cm in depth (Figure 9).

Few lithics were recovered from Test Unit 1 (Table 12). One interior flake of unidentified chert was found between 30 and 40 cm, and one untyped projectile point tip (FSN 23-3) was found between 50 and 60 cm (Plate 3b).

Soil texture and grain size analyses were performed on samples from this test unit. Based on grain size distributions, the sediments are braided stream channel fills.

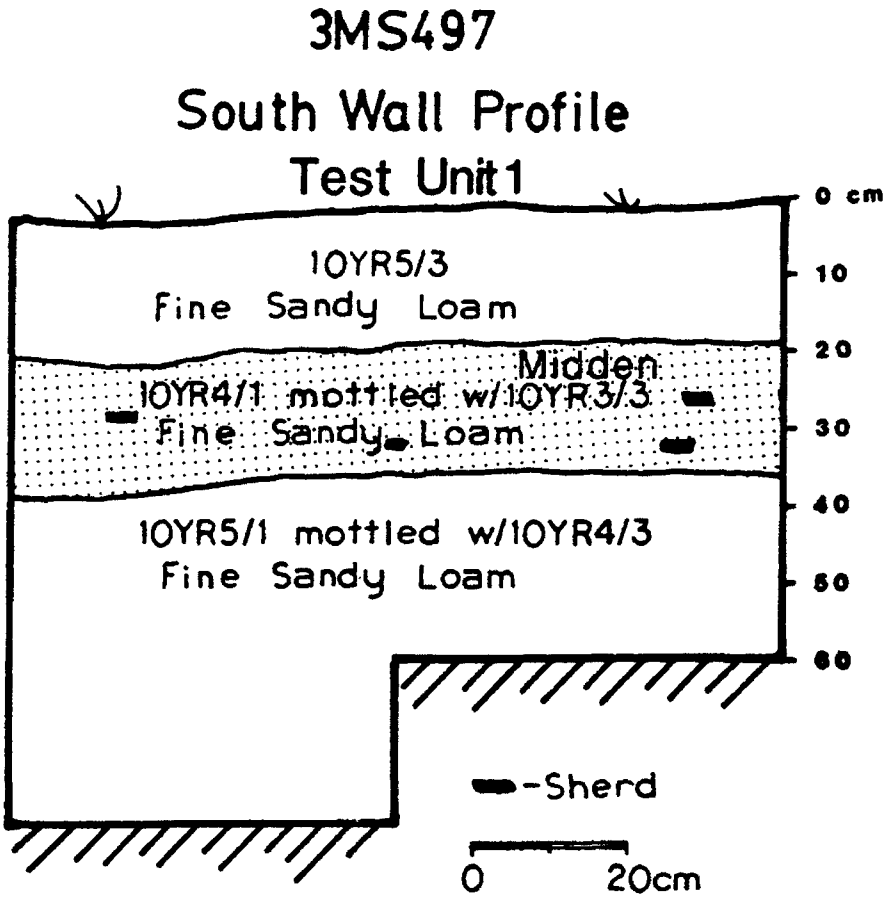


Figure 9. Profile of Test Unit 1, 3MS497.

Significance and Recommendations

The artifacts indicate that the principal component is Late Woodland. A Mississippian component is represented by seven plain, shell tempered sherds in Test Unit 1. This component may be more extensive in areas not sampled by Test Unit 1, although no shell tempered sherds were found on the spoil from Buffalo Creek Ditch. In addition, there is a thin veneer of mid-twentieth century artifacts on the surface.

The density and distribution of sherds in Test Unit 1, especially when contrasted to the low density on the surface, demonstrates that 3MS497 is a buried site, with only the upper portion disturbed by plowing. The combined distributions on the spoil and in the field indicate that the site is much larger than the surface distribution in the field would suggest. Since determining the limits of buried sites was not within the scope of the present project, the horizontal extent of the site is not known. Some parts of the site may also be more deeply buried than the area sampled by Test Unit 1. The prehistoric deposits are considered significant and eligible for nomination to the National Register. Further testing is recommended in order to find the limits of the buried site and to collect additional information to fill out the nomination form. Deep subsurface tests should be included in the testing phase in order to determine if the proposed project will adversely affect the site.

3MS498

Description

Site 3MS498 was discovered within the project right of way west of Ditch 13. The site was identified by a thin surface distribution of shell tempered and sand tempered sherds and historic artifacts, including transfer wares and a gun flint made from French chert (Figure 10).

During SPEARS first visit to the site in early August, the site was in soybeans, with about 90% visibility. A temporary datum was established, a sketch map of the site was made, and four diagnostic artifacts (1 prehistoric and 3 historic), including the gun flint were collected. In addition, all artifacts observed within one meter of the gun flint were collected.

The artifacts observed appeared to represent a nineteenth century homestead, and Late Woodland and Early Mississippian components. The site was subjected to limited testing and it was mapped with a transit and stadia, four rows of 4 m x 4 m controlled collection units were conducted, and a 1 m x 1 m test unit was excavated (Figure 11). A complete listing of the artifacts collected is found in Appendix E (Tables E6 and E7).

Controlled Surface Collections

One hundred sixteen 4 m x 4 m controlled collection units were collected. These units totaled about 25% of the area of the observed artifact distribution. The collection units were aligned in four rows (Figure 10). Three of these rows (Rows A, B, D) were oriented generally east-west, parallel to the bean rows to lessen the effort expended in collecting and to reduce damage to the crop. The three rows were also generally perpendicular to the terrace edge occupied by the site. One row (Row C) was oriented perpendicular to the other three rows, so that intrasite variability of artifact distributions could be better assessed.

Rows A and D, respectively, were located near the northern and southern limits of the observed artifact distribution to aid in defining the site boundaries. Rows C and D were positioned to intersect near the area of highest observed artifact density. The distribution of sand tempered sherds was broader than the distribution of shell tempered and shell/sand tempered sherds (Figure 10). This difference is especially noticeable in the southeast corner of the site where no shell tempered sherds were found. Higher counts for both sand tempered and shell tempered sherds occur near the center of the site in an apparently NE-SW trend.

Few lithic artifacts were found (Table 13). These included one projectile point fragment in unit C13 (FSN 78-5, Plate 1e), and one pitted, edge-ground cobble in unit D6 (FSN 96-3, Plate 6h).

Historic artifacts were more thinly scattered than the prehistoric artifacts. The distribution was similar, with the highest density of historic artifacts in the same area of the site as the highest density of prehistoric artifacts (Figure 70).

Test Unit 1

Test Unit 1 was a 1 m x 1 m excavation unit, located a few meters northeast of the highest density of surface artifacts. Although the location of the unit was primarily determined by the observed artifact density, some consideration was given to potential crop damage; and the unit was placed in an area near the highest artifact density where the soybeans were less developed.

The plowzone in Test Unit 1 was 30 cm deep (Figure 11) and contained both prehistoric and historic artifacts. The historic artifacts, discussed in the Historic Sites and Artifacts section included glass, whiteware, a blue transfer sherd, six square nails, a pipe bowl fragment and unidentified metal fragments. The base of the plowzone was readily identified by plowscars and a change to a darker soil color. No historic artifacts were found below this depth.

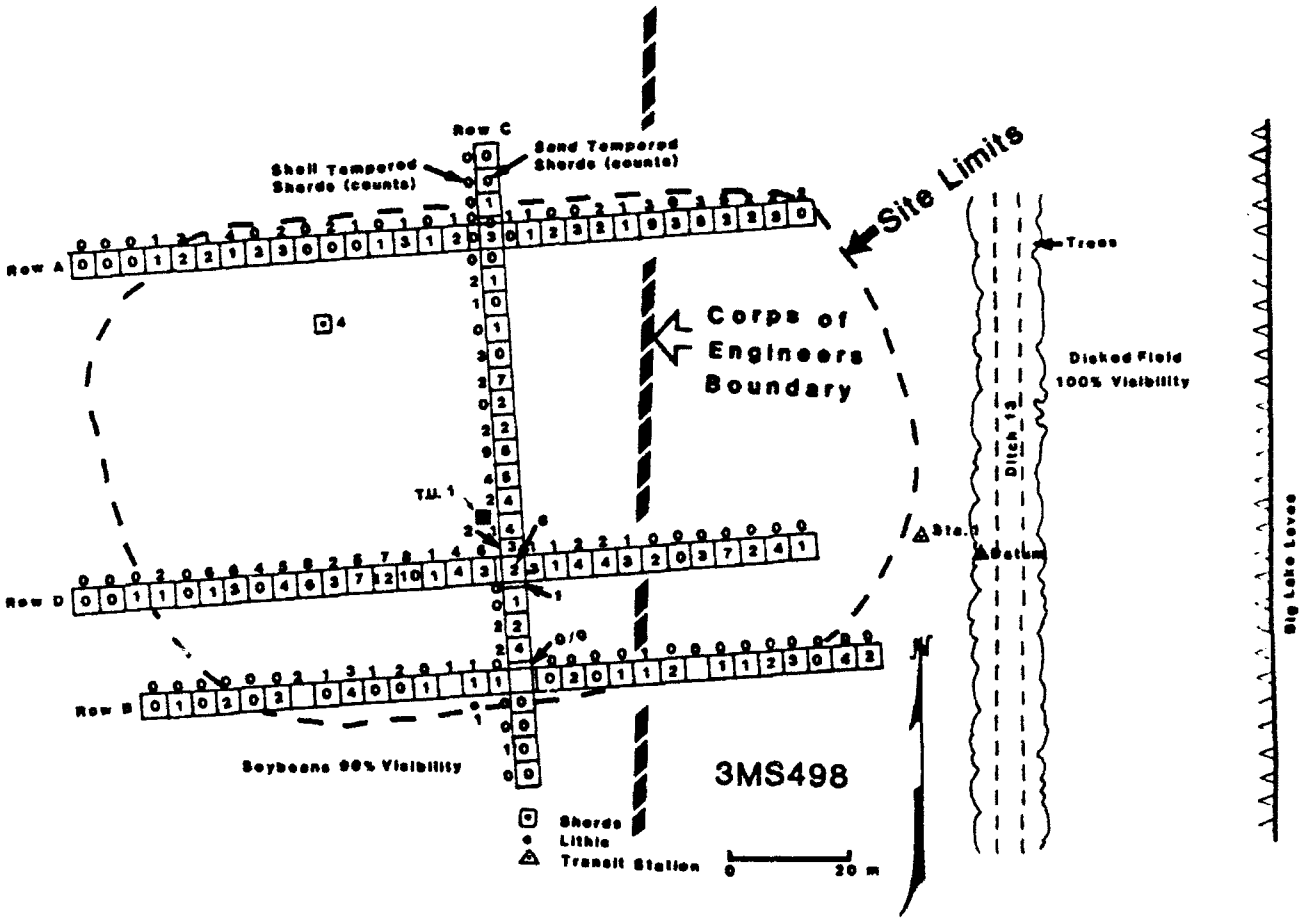


Figure 10. Site Map of 3MS498 Showing the Distribution of Ceramics in the Controlled Surface Collections.

Prehistoric artifacts in the plowzone included both shell tempered and sand tempered sherds (Table 14). Sherd densities increased downward through the plowzone excavation levels, and the first two 10 cm levels below the plowzone (30 to 50 cm) contained high densities. Sand tempered sherds in the plowzone were found in slightly higher numbers than shell tempered sherds, but immediately below the plowzone the number of sand tempered sherds increased only slightly while the shell tempered sherd count more than tripled.

Table 13. Lithic Artifacts Collected in Test Unit 1 and on the Surface Outside the Controlled Surface Collection Units at 3MS498.

ABBREVIATIONS USED: O=Other; IFLK=Interior Flake; FCR=Fire Cracked Rock; UNMOD=Unmodified Stones.

FSN	LOCATION	O	IFLK	FCR	UNMOD	TOTAL
1	Surface	1				1
122	TU1 0-10				2	2
124	TU1 20-30		1			1
126	Surface			2		2
	TOTAL	1	1	2	2	6

From 50 to 80 cm the shell tempered sherd count decreased steadily from the high densities at 30 to 50 cm, and no shell tempered sherds were found below 80 cm except in an intrusive pit, Feature 1 (described below). Sand tempered sherd counts remained nearly constant from 50 to 80 cm, and decreased only slightly from 80 to 90 cm. The sand tempered sherds from 70 to 90 cm were mostly restricted to a thin, undulating band of dark sediment, with a sterile, yellowish brown sandy loam above and below. A few sherds were also found in Feature 1.

Table 14. Ceramics Collected in Test Unit 1, 3MS498.

ABBREVIATIONS USED. Ceramics listed by temper. PL=Plain; RF=Red Filmed; OTR=Old Town Red; VR=Varney Red; CDM=Cordmarked; O=Other; FC=Fired Clay; P=Ceramic Particles.

FSN	LOCATION	SHELL				SAND			SAND/SHELL		FC	P	TOTAL
		PL	RF	OTR	VR	PL	CDM	O	PL	RF			
121	TU1 Surf.	1			1								2
122	TU1 0-10	12				28					5	X	45
123	TU1 10-20	14			3	17	8				8	X	50
124	TU1 20-30	16	4			20	2	2	2	7	11	X	64
125	TU1 30-40	70		7	15	26	18				28	X	164
126	TU1 40-50	78		11	9	22	11		6	5	55	X	197
127	TU1 50-60	45		4	7	16	18		5	2	21	X	118

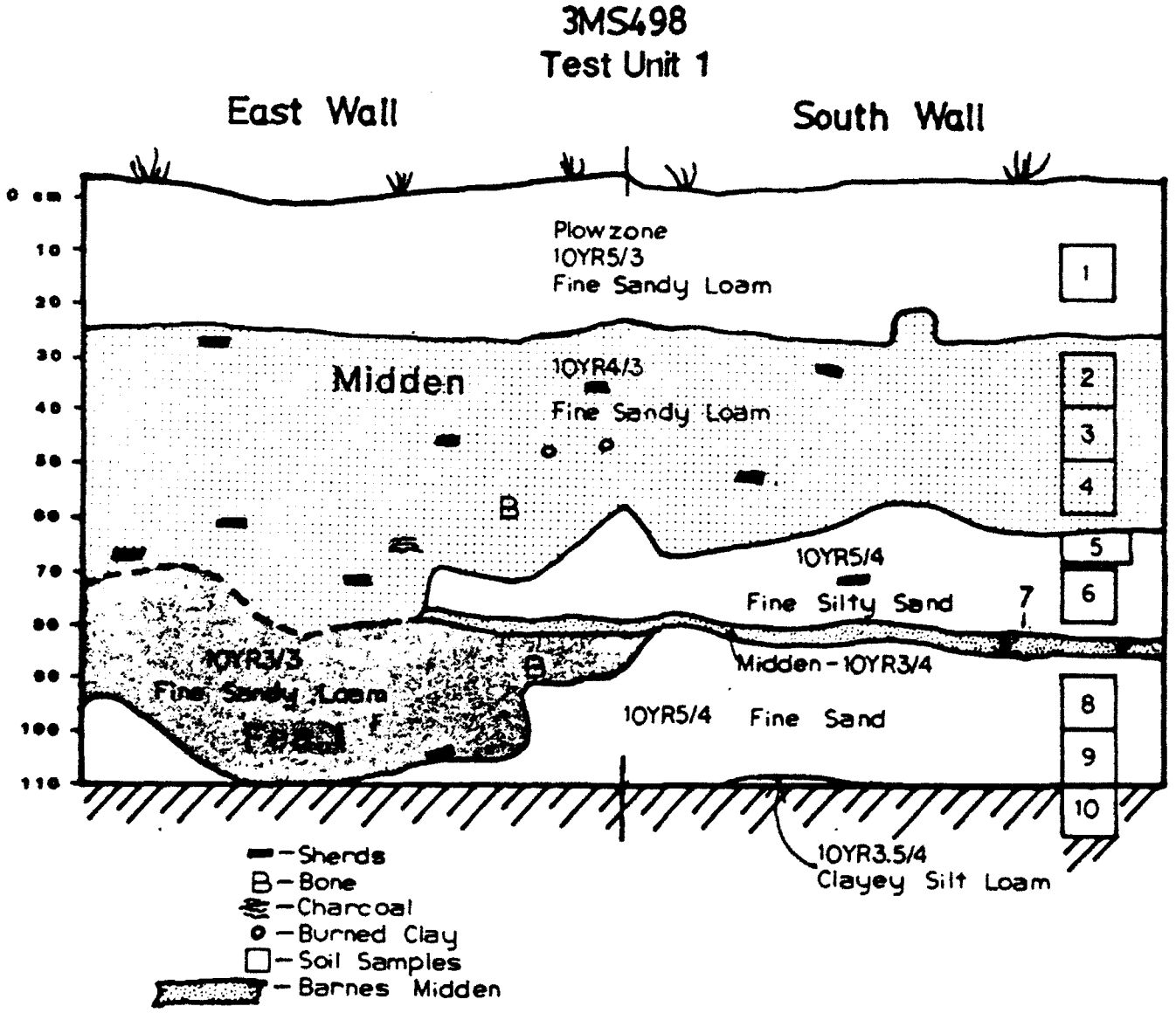


Figure 11. Profile of Test Unit 1, 3MS498.

FSN	LOCATION	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RF	OTR	VR	PL	CDM	O	PL	RF			
128	TU1 60-70	28		2		17	7		3		17	X	74
129	TU1 70-80	11				22	12				7	X	52
130	TU1 80 cm					3	1						4
131	TU1 80-90					2							2
132	TU1 80-90					21	3	1			5		30
133	TU1 90-100					3	1				8		12
134	TU1 100-110					1	8						9
135	TU1 100-110	5		1									6
	TOTAL	280	8	25	25	198	89	3	16	14	165	X	829

From 100 to 110 cm nine sand tempered sherds were found. These sherds were on the surface of a dark yellowish brown loam similar to the thin band at 80 cm. Test Unit 1 was not excavated below 110 cm, but the dark yellowish brown loam was apparently sterile. A soil core would only penetrate this compact sediment to a depth of 154 cm, and no change was noted to that depth.

Both the east and south wall profiles of Test Unit 1 were drawn and photographed (Figure 11). The natural stratigraphy of the site was preserved in the south wall while the east wall showed the Mississippian pit, Feature 1, which intruded into the underlying Woodland stratigraphic levels. Soil texture samples for lab analysis were collected from the undisturbed strata in the south wall.

Feature 1 was first identified at 70 cm as a dark stain intruding a light brown sandy loam. A small area of compact soil first mapped at 40 cm was in the same horizontal locus as Feature 1, and may indicate that the feature originated near the top of the undisturbed strata below the plowzone. Shell tempered sherds indicated that it was a Mississippian feature, although it also contained Woodland ceramics. Because the fill of Feature 1 was similar in color to the dark yellowish brown stratum which undulated between 70 and 90 cm, the feature could not be distinguished until the excavation reached 100 cm in depth. This feature was excavated as part of the arbitrary levels to 100 cm and probably accounts for all of the shell tempered sherds found below 60 cm. From 100 to 110 cm Feature 1 was excavated separately from the general level and the fill was collected for later water screening. The base of Feature 1 was at 110 cm. Its profile and bottom configuration indicate that it was a bell shaped storage pit.

Ceramic artifacts dominated the collection from Test Unit 1. Three lithic artifacts in the plowzone included one pebble, one unmodified angular fragment, and one interior flake of unidentified chert (Table 13). Floral materials and charcoal were also collected from Test Unit 1. One carbonized bean and two carbonized acorn fragments have been tentatively identified.

In summary, Test Unit 1 revealed intact prehistoric cultural strata beneath a deep plowzone that contained both historic and prehistoric artifacts. No historic artifacts were found below the plowzone. The uppermost intact stratum appears to be a Mississippian midden with pit features which intrude into lower strata. These lower strata include two Woodland occupation levels separated from each other by a sterile sandy loam stratum and separated from the Mississippian midden by a second sandy loam stratum which, too, may be sterile. A third Woodland component may be mixed with the Mississippian midden.

The sequence of strata apparently represents an accreting natural levee occupied between flood episodes by Woodland people. The thickness of the Mississippian midden may also have resulted partly from sediment deposition during the Mississippian occupation, and the thick plowzone may indicate that the floods continued to deposit sediments during the historic occupation.

Significance and Recommendations

The majority of artifacts collected at 3MS498 are prehistoric ceramics. Woodland ceramics occur in slightly greater numbers than Mississippian ceramics in surface collection totals and in the plowzone of Test Unit 1. However, the shell tempered and sand tempered sherds differ in both their horizontal distributions in the controlled collection and in their vertical distributions below the plowzone in Test Pit 1. Notably, no Mississippian ceramics were found in the controlled collection units in the southeast portion of the site; and none was found below 80 cm in Test Unit 1 except in Feature 1, an intrusive pit. Woodland ceramics were found more widely distributed on the surface, and were found in unmixed contexts in the lowest levels of Test Unit 1. From 30 to 70 cm in Test Unit 1, in what has been interpreted to be a Mississippian midden, shell tempered sherds significantly outnumbered sand tempered sherds. The sand tempered sherds in the Mississippian midden may have been derived from lower Woodland strata mixed into the midden by deep pits such as Feature 1.

The mixing of Mississippian and Woodland ceramics in the plowzone is also attributed to mixing by intrusive pits along with mixing by plowing. The lesser densities of prehistoric artifacts in the plowzone may be attributed to destruction by modern agriculture and/or additional sedimentation on the natural levee after the Mississippian occupation. However, no direct evidence for these processes has been documented.

There is no indication that more than one Mississippian occupation is present. Mississippian sherds with a combination of shell and sand tempering, sherds with red slips on one or both surfaces, and the lack of any other kind of decorated sherds are compatible with a single, relatively early, Mississippian occupation. Of 515 sherds attributed to the Mississippian component, 425 have shell tempering and 90 have a combination of shell and sand tempering (Table 14). Of the 425 shell tempered

sherds, 90 (21.1%) have a red slip on one or both surfaces. Of the 90 sherds with a combination of shell and sand tempering, 27 (30%) have a red slip. The overall percentage of Mississippian sherds with red slip is 22.7%.

The stratigraphy in Test Unit 1 definitely indicates that more than one Woodland occupation is preserved at the site. However, these separate occupations may not be separated by any significant intervals of time. Single flood episodes may account for each of the sterile strata separating the Woodland components.

These intact stratified deposits are clearly significant and eligible for nomination to the National Register. Further work to include testing for boundaries is recommended. Subsequent to testing, a management plan for the site needs to be devised. If the proposed plans cannot be changed to avoid the site, then a mitigation plan, which would include excavations should be developed and followed for 3MS498. It is the landowner's intention to level this field as soon as funding is obtained. Corps of Engineer's ownership or easement for this site should be pursued in a timely manner, since it is the proposed channel improvements which will make landleveling practical for the farmer.

3MS501

Description

3MS501 was first recorded as a small scattering of eight small Barnes sherds found in a milo field west of the Big Lake Levee. Visibility at that time was about 50%. On a second visit to map the site, the visibility was even poorer due to the mature crop interspersed with dense, high cockleburs. A permanent datum was established on the second visit, but no subsurface tests were conducted because permission to test the site was denied while crops were in the field.

A third visit was made to the site in February, 1987. At that time a young wheat crop had been planted, but visibility was still good, about 90%. A higher density of Barnes sherds (about 30-50) and one small unidentified projectile point fragment, which was made on Crowley's Ridge chert, were observed on the surface of the site. All artifacts were flagged and the distribution was mapped as 48 m E-W x 64 m N-S (Figure 12). The majority of the site area lies in the project right-of-way. One Controlled Column and 2 shovel tests were excavated, since the land owner was reluctant to allow larger subsurface units.

Controlled Column 1

Controlled Column 1 was positioned on the top of the rise in the center of the surface distribution. One artifact, a sand tempered, cordmarked Barnes sherd was collected from the plowzone,

which was about 18 cm thick (Figure 13). Below it was about a 10 cm sub plowzone level. From 30-50 cm was a sandy loam and at 50 cm below the surface a burned clay ball was found (Table 15). From 50-70 the sediments changed in color and texture, but no additional cultural materials were found. The unit was terminated at 70 cm below the surface. The clay ball was the only artifact found below the plowzone.

Table 15. Artifacts Collected at 3MS501.

LOCATION	SAND TEMPERED SHERDS PLAIN	CORDMARKED	FIRED CLAY	TOTAL
SURFACE	8			8
CC1 0-20		1	x	1
CC1 50cm			1 sphere	1
ST2-30cm	1			1
TOTAL	9	1	1	11

Shovel Tests 1 and 2

Shovel Test 1 was positioned on the top of a smaller, and lower rise. It was excavated to about 50 cm below the surface and did not contain cultural material or evidence of anthropic levels. Shovel Test 2 was positioned toward the eastern edge of the site in a lower area where fewer artifacts were observed on the surface. It contained a thinner plowzone and subplowzone (Figure 13). Below 25 cm there was a dark, highly organic sediment which was characteristic of a midden or feature and it contained one sandtempered sherd. This cultural zone was only 10 cm thick and it was underlain by a coarse sand which at 45 cm below the surface contained numerous black precipitates and charcoal.

Significance and Recommendations

Based on the presence of two suspicious and possibly intact cultural levels at the site, there is a potential for intact features or deposits. Additional testing needs to be conducted at this site in order to determine if it is significant and eligible for nomination to the National Register. The testing program recommended should include deep subsurface tests to collect information on the nature and context of the deposits. Backhoe trenches would also assist in understanding the landform which was occupied. Additional Controlled Columns may have to supplement the test units and backhoe trenches in order to determine subsurface site boundaries. The testing program will have to be scheduled when the field is fallow in order to obtain the permission of the landowner.

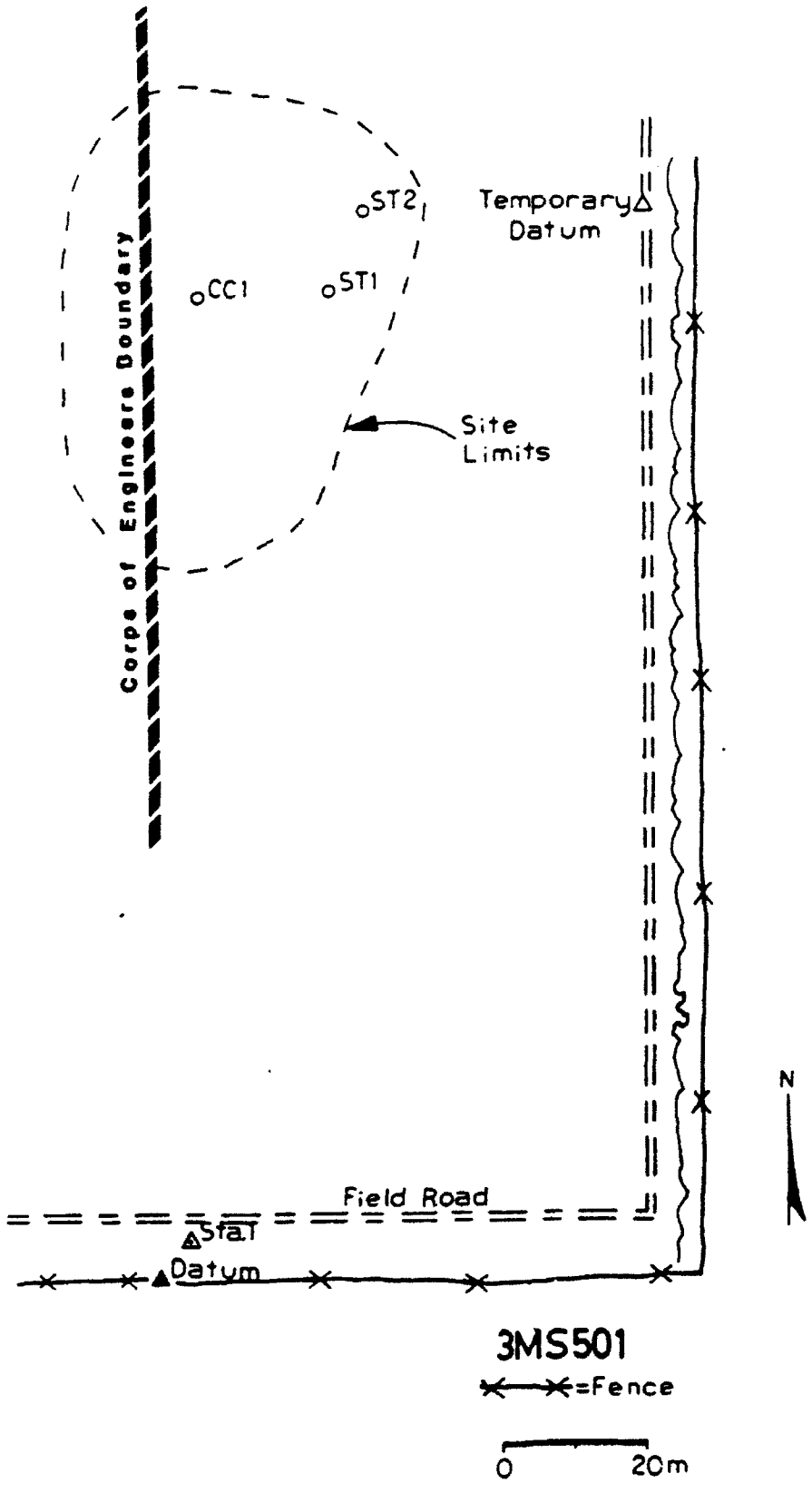


Figure 12. Site Map, 3MS501.

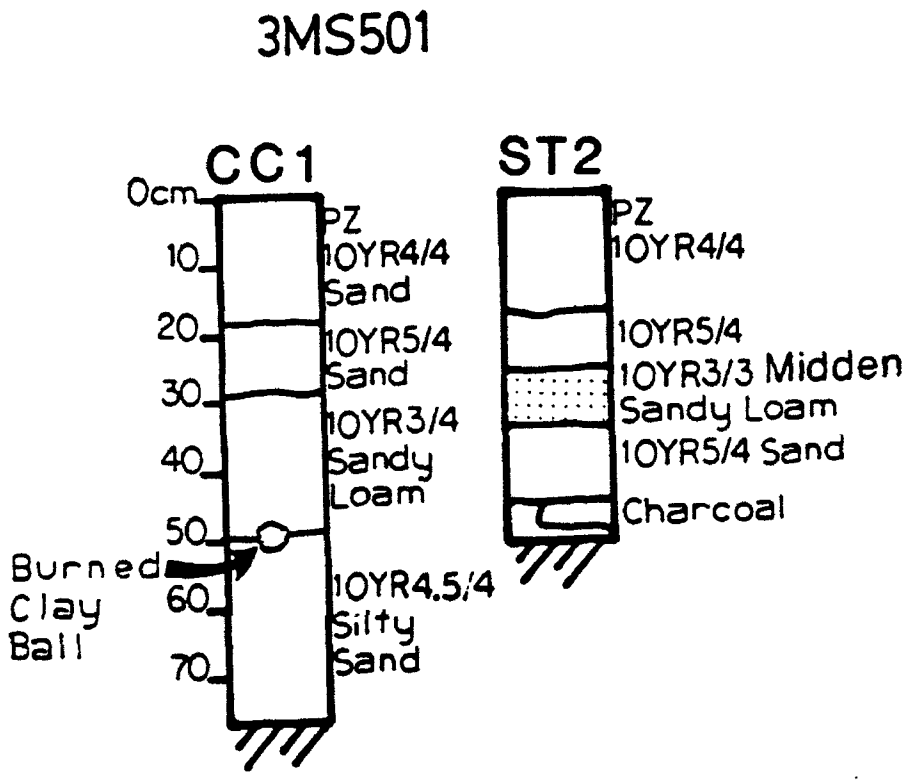


Figure 13. Profiles of Controlled Column 1 and Shovel Test 2, 3MS501.

Description

3MS502 is a large multicomponent site, dating from the Woodland to the Mississippian periods, located on the west side of Big Lake. A high density of shell tempered pottery, daub and sand tempered pottery was observed over a large area measuring about 400 m N-S x 50 m E-W. Investigative techniques included about 150 Controlled Surface Collections, one Test Unit, and two Controlled Columns (Figure 14). The controlled collections indicated that although densities over much of the site were low, there were spatially and temporally distinct areas. The subsurface tests showed that much of the deposit was shallow and artifacts were confined to the top plowzone level, but as shown in Controlled Columns 2, there are areas where intact deposits, either cultural middens or features, remain. One sherd was found on the surface of the field on the east side of the small drainage ditch and this portion of the site may have buried, intact deposits and otherwise be less disturbed than the western side of the small ditch.

Controlled Surface Collections

About 150 Controlled Surface Collection units (4 m x 4 m) were collected at the site which resulted in over 700 ceramic artifacts. These included over 180 shell tempered sherds, almost 50 sand and shell tempered sherds, over 400 plain sand tempered sherds and almost 100 cordmarked sand tempered sherds. Shell tempered ceramics included Old Town Red, Varney Red Filmed, and a red filmed or slipped type. The ceramics collected are listed by unit in Appendix E (Table E8).

Lithic artifacts included seven tools, about 20 flakes, and several fire cracked or unmodified rocks. Several material types were present including Burlington-like chert, Crowley's Ridge chert, and unidentified material. In A4 one biface (FSN 13-2) which is probably a preform was found. It was composed of an unidentified chert. A utilized biface (FSN 19-5) which may be an arrowpoint fragment was found in A10. It also is composed of an unidentified material. A sandstone abrader (FSN 46-1) (Plate 6e) with multiple grooves was collected in B10. A small cobble utilized as a hammerstone (FSN 49-1) (Plate 4g) was collected in B12. It is composed of Burlington-like chert. An arrowpoint (FSN 70-1) (Plate 3g) with shallow side notches was collected in C5. It is composed of a greenish chert resembling alibates. In C12 an adz-like scraper (FSN 75-4) (Plate 5d) was found. An untyped expanded stem projectile point (FSN 84-1) (Plate 3c) was collected in D3. It is composed of Crowley's Ridge chert. A complete listing of the lithics collected in the controlled surface collections is presented in in Appendix E (Table E9).

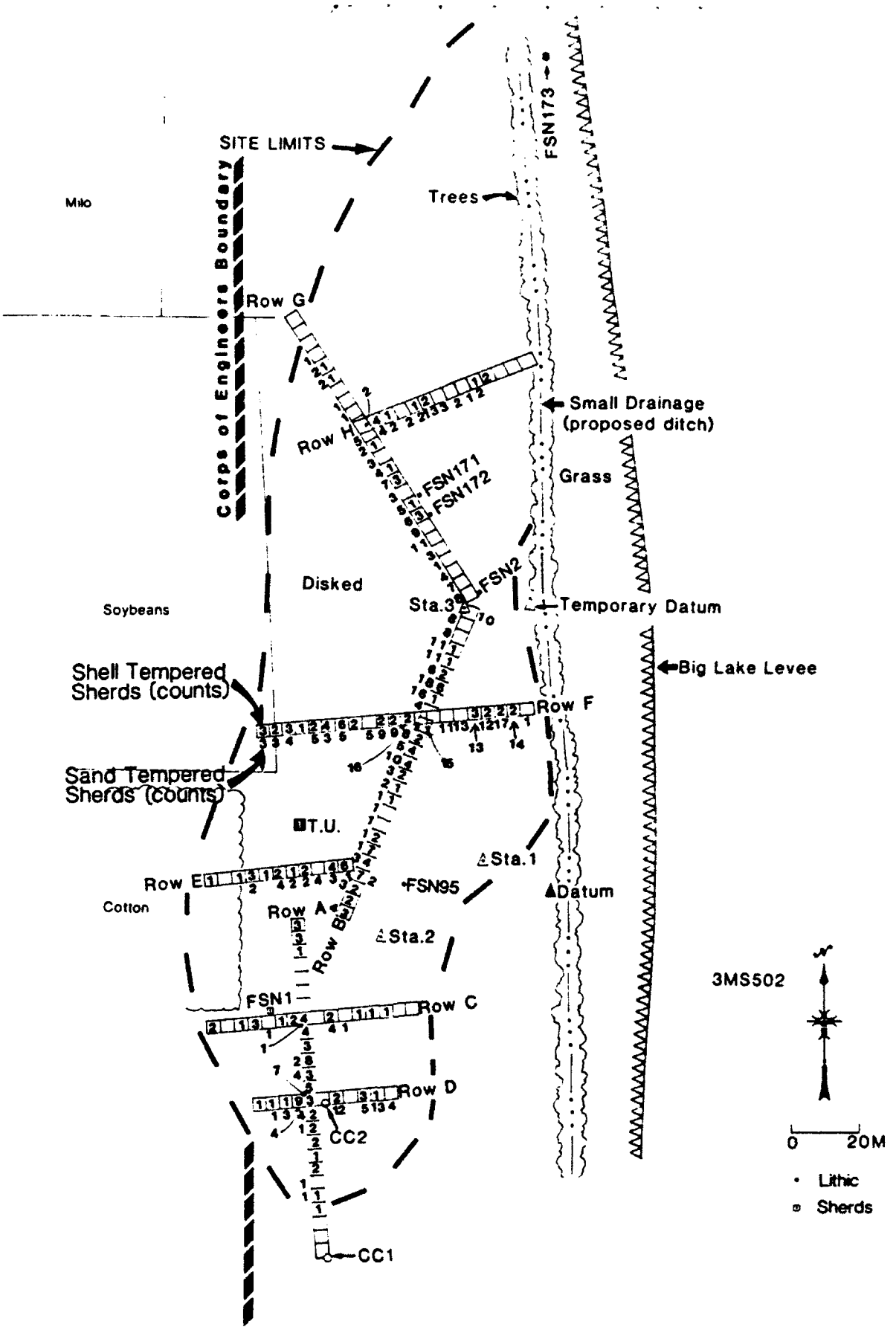


Figure 14. Site Map of 3MS502 Showing the Distribution of Ceramics in the Controlled Surface Collections.

The controlled surface collections showed that there were spatially distinct temporal areas. The sherd counts as plotted by temper are shown in Figure 14. The Late Woodland or Barnes ceramics cluster at the east end of Row D and F and in the center of Row G and H. The Mississippian Component was more pronounced on the west end of D (in the vicinity of Controlled Column 2 where intact deposits were found), at the south end of Row B, and at the West end of Row F. The meaning of these "clusters" is not clear, but they could represent features such as house areas or refuse pits from differing time periods. The sand/shell tempered sherds were also plotted on a different map and examined. Sherds with this mixture of tempers were collected in 24 units and their distribution overlapped shell tempered ceramics in 12 units or 50%. They overlapped units with sand tempered sherds in 18 or 75% of the units. The meaning of these relationships is not clear. If an hypothesis presented by Dunnell and Feathers (1986) that different firing temperatures are required for sand and shell tempered ceramics is true and if sand/shell is transitional between the two techniques, then the distribution further supports temporally distinct areas at this site.

Table 16. Ceramics Collected Outside the Controlled Surface Collection Units at 3MS502.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; OTR=Old Town Red; VR=Varney Red; RS=Red Slipped; DEC=Decorated; FC=Fired Clay; P=Particles.

LOCATION	SHELL			SAND/SHELL			SAND	SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM				
surf mapped		1										1
surf FSN50							1(grooved)					1
surf Site 52							1					1
surf TU1	1				1					x		2
surf near CC2			2							x		2
TOTAL	1	1	2		1		2					7

Table 17. Lithic Artifacts Collected on the Surface of 3MS502.

ABBREVIATIONS USED: PP=Projectile Point/knife; UB=Utilized Biface;A=Adz; PRE=Preform; DR=Drill; UF=Utilized Flake; B=Biface; H=Hammerstone; AB=Abrader; C=CORES; TC=Tested Cobble; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; PT= Preform Thinning Flake; FCR=Fire Cracked Rock; UM=Unmodified Cobbles, Stones or Angular Fragments.

UNIT	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	PT	FCR	UM	TOTAL
FSN 2														1				1
FSN 171														1				1
FSN 172														1				1
TOTAL														3				3

Test Unit 1

Test Unit 1 was positioned in an area which seemed to have a high frequency of shell tempered sherds. The artifacts collected by each 10 cm are listed in Table 18. The plowzone was about 30 cm in this test unit and was excavated in three levels. Below it was a very compact sterile sediment (Figure 15). A portion of the unit was excavated to 70 cm below the surface and then a soil core indicated a coarsening of the sediments with depth. No organic material was present in this unit and no intact anthropic levels were observed. It is likely that portions of this site have been destroyed through continual plowing and leveling. The sherds both on the surface and in this test were small, a further indication of a long exposure to the elements and repetitive destructive activities.

Table 18. Artifacts Collected in Subsurface Units at 3MS502.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; OTR=Old Town Red; VR=Varney Red; RS=Red Slipped; DEC=Decorated; FC=Fired Clay; P=Particles.

LOCATION	SHELL			SAND/SHELL			SAND		IFLK	UNMOD	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
TU1 0-10	5						4					x	9
TU1 10-20	9						7	1				x x	17
TU1 20-30	4	1					5	1				x x	11
CC1 0-10	3						4					x	7
CC1 10-20	1											x	1
CC2 0-10	2			2	2		14	1		1		x x	22
CC2 10-20	4						12		1			x x	17

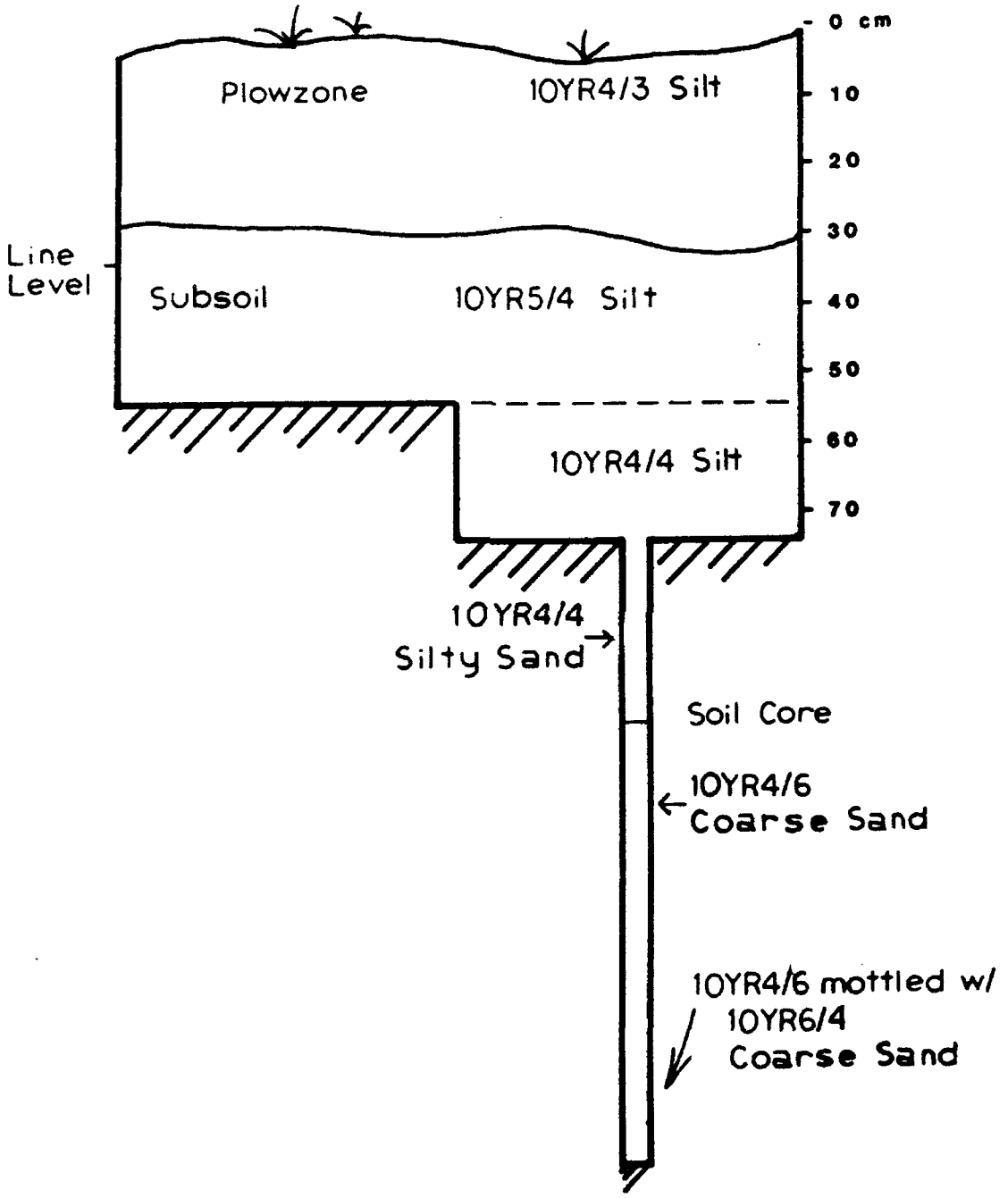


Figure 15. Profile of Test Unit 1, 3MS502.

LOCATION	SHELL			SAND/SHELL			SAND		IFLK	UNMOD	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
CC2 20-30	2			1				14			x	x	17?
CC2 30	1						4						5
CC2 35					1		1						2
CC2 35				1									1
CC2 32-40	3			1							x	x	4
CC2 40-50								1			x		1
CC2 50							1						1
TOTAL	34	1		5	3		52	18	1	1			115

Controlled Column 1

Controlled Column 1 was positioned at the south end of the Controlled Surface Collection grid and on the periphery of the surface distribution. It contained a plowzone level which was only about 22 cm thick (Figure 16). Below it was a compact silt which did not contain cultural material. The unit was terminated at 30 cm because all the artifacts were confined to the upper plowzone level.

Controlled Column 2

Controlled Column 2 was placed in an area where controlled surface collections indicated a high density of artifacts. This test contained a plowzone level to about 28 cm below the surface (Figure 17). Below that was a darker intact cultural midden or feature. The cultural stratum was darker than the plowzone level and it contained small flecks of charcoal and burned clay. From 30-35 cm all artifacts were mapped in situ. Almost all of the sherds observed (Figure 17) were found lying vertical indicating that this might be a pit feature as opposed to a cultural midden or house floor. There also is the possibility that the anomaly is a natural feature such as a tree root. As listed in Table 18, the plowzone contained the higher density of cultural material but on the whole the ceramics were smaller. The intact cultural deposit contained larger sherds, and the 12 sherds collected between 30-40 cm represent a fair density of material. At 40 cm below the surface the controlled column floor was scraped, but no evidence of a feature edge was apparent. Some light mottles were noted. Only one sherd, a Barnes cordmarked, was collected from 40-50 cm. At 50 cm a sand tempered sherd was found which was also in a vertical position. The controlled column was terminated at 50 cm due to the difficulty in excavating a small unit to such a depth. The position of the sand tempered sherd below the shell tempered ceramics indicates that the site may contain stratified cultural deposits.

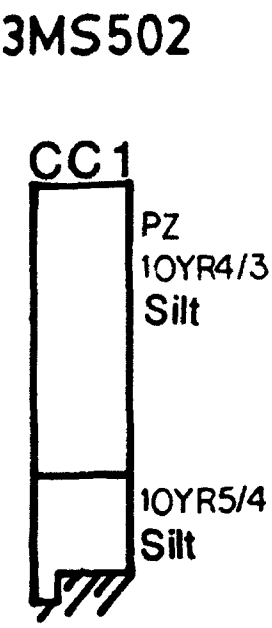


Figure 16. Profile of Controlled Column 1, 3MS502.

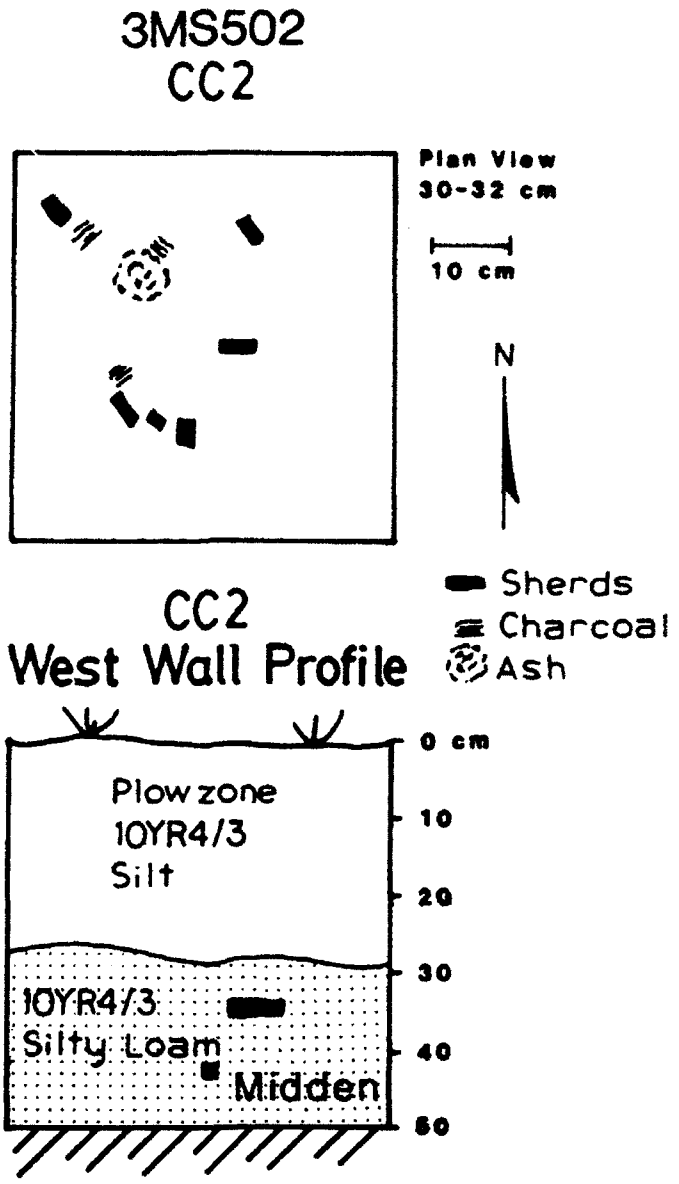


Figure 17. Profile and Floor Plan View of Controlled Column 2, 3MS502.

Significance and Recommendations

The presence of possible intact deposits at 3MS502 and the fact that spatially distinct temporal units were evident on the surface indicates that this site is worthy of further testing to determine the significance of the deposits and their distribution. These investigations should involve several different techniques including: (1) scraping the plowzone off fairly large areas to see if features remain below the plowzone, (2) excavating features in a controlled manner, (3) excavating backhoe trenches in order to examine whether more deeply buried deposits remain, and (4) excavating controlled columns or other subsurface units in order to determine the extent of the the site.

3MS503

Description

When 3MS503 was discovered, the site consisted of two Barnes sherds located in a milo field west of Big Lake. The surface visibility was poor, only about 20-40%. A late twentieth century historic scatter was also observed about 30 m west of the Barnes sherds. Subsurface testing was not conducted at this site because the landowner would not grant permission to test while crops were in the field.

In February, 1987, 3MS503 was revisited and the main distribution of material on the surface measured 70 m N-S x 85 m E-W, but artifacts were found on both the east and west sides of the small drainage ditch (Figure 18). The area had been planted in winter wheat, but surface visibility was good, about 90%. The landowner was still reluctant to allow testing in this field. All artifacts were flagged and then mapped with a transit and tape. A permanent datum was established and one controlled column was excavated.

Surface Collections

Twelve Barnes sherds were collected on the surface of the site along with one piece of burned clay, 1 fire cracked rock, and 1 untyped expanded stem projectile point (FSN 8-1) (Plate 3d). All this material dates to the Late Woodland period.

Controlled Column 1

Controlled Column 1 was excavated in a small cluster of sherds. The profile of this unit is shown in Figure 19. The plowzone in this location was about 20 cm thick. It was underlain by a slightly lighter sediment which continued to at least 50 cm where the unit was terminated. One sand tempered sherd was collected from this test at 26 cm below the surface.

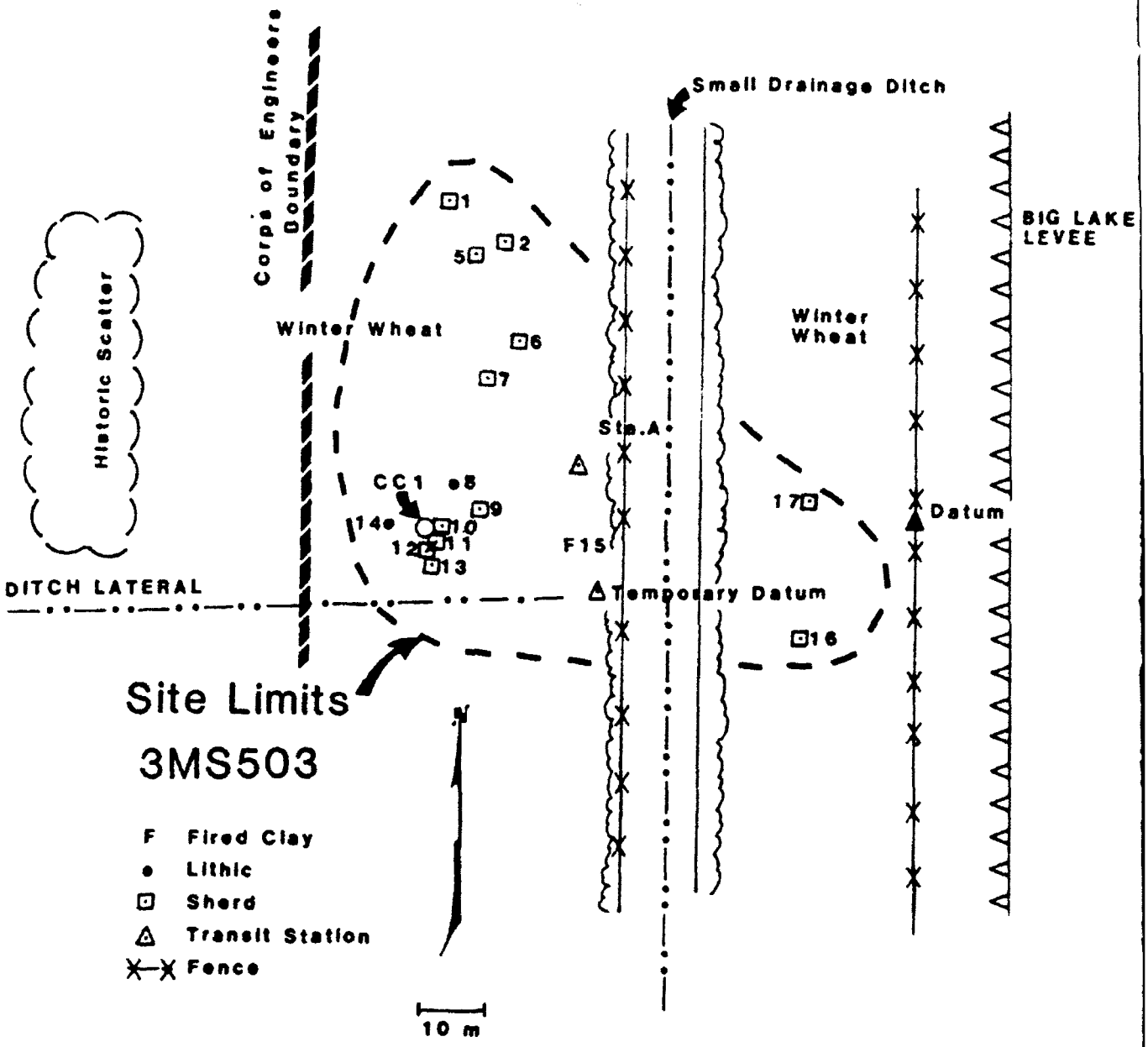


Figure 18. Site Map, 3MS503.

Significance and Recommendation

The sediments were not characteristic of a midden, but the fact that the cultural material was found below the plowzone indicates that the site needs additional testing to establish its significance. Further investigations should be conducted on both sides of the small ditch which is proposed for enlargement. A combination of testing methods is recommended and could include controlled excavations, scraping off the plowzone in certain areas to test for truncated features, and backhoe trenches in order to determine whether deep intact deposits exist. Due to the landowner's reluctance to allow testing when crops are in the field, this work can be conducted only at limited times during the year.

3MS504

Description

3MS504 is a multicomponent (Late Woodland, Mississippian, and twentieth century historic) site located on a low sandy rise west of Buffalo Creek Ditch. The area had been disked and rained on so that surface visibility was about 100%. A moderate concentration of ceramics, lithics, and historic artifacts was observed in an area approximately 100 m x 70 m. Several small concentrations of artifacts, especially sherds, were observed in the center and on the southeastern edge of the site. No midden staining was apparent. Investigations at the site included 50 Controlled Surface Collections positioned across several clusters of artifacts, one 1 m x 1 m test unit, one controlled column and eight shovel tests.

Surface Collections

During initial site testing at 3MS504, four projectile points and one arrowpoint were collected from the surface of this site. FSN-1-1 is a Gary-like contracting stem projectile point which has been reused and is made of an unidentified chert (Plate 3e). FSN 3-1 is a Gary projectile point (Plate 1f). FSN 5-1 is a an untyped side notched projectile point which has also been reused (Plate 2e). FSN 20-1 is a midsection of a projectile point which was subsequently reused as a scraper. FSN 13-1 is a Scallorn arrowpoint made of Burlington-like chert. The artifacts are listed in Tables 19 and 20.

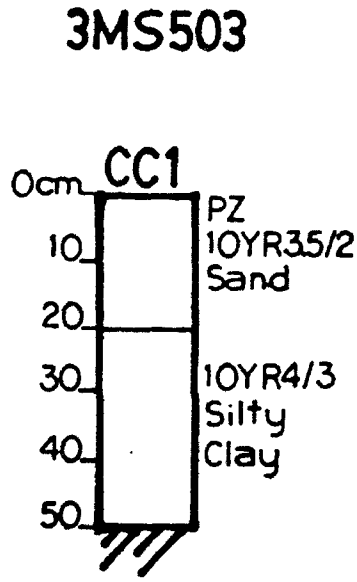


Figure 19. Profile of Controlled Column 1, 3MS503.

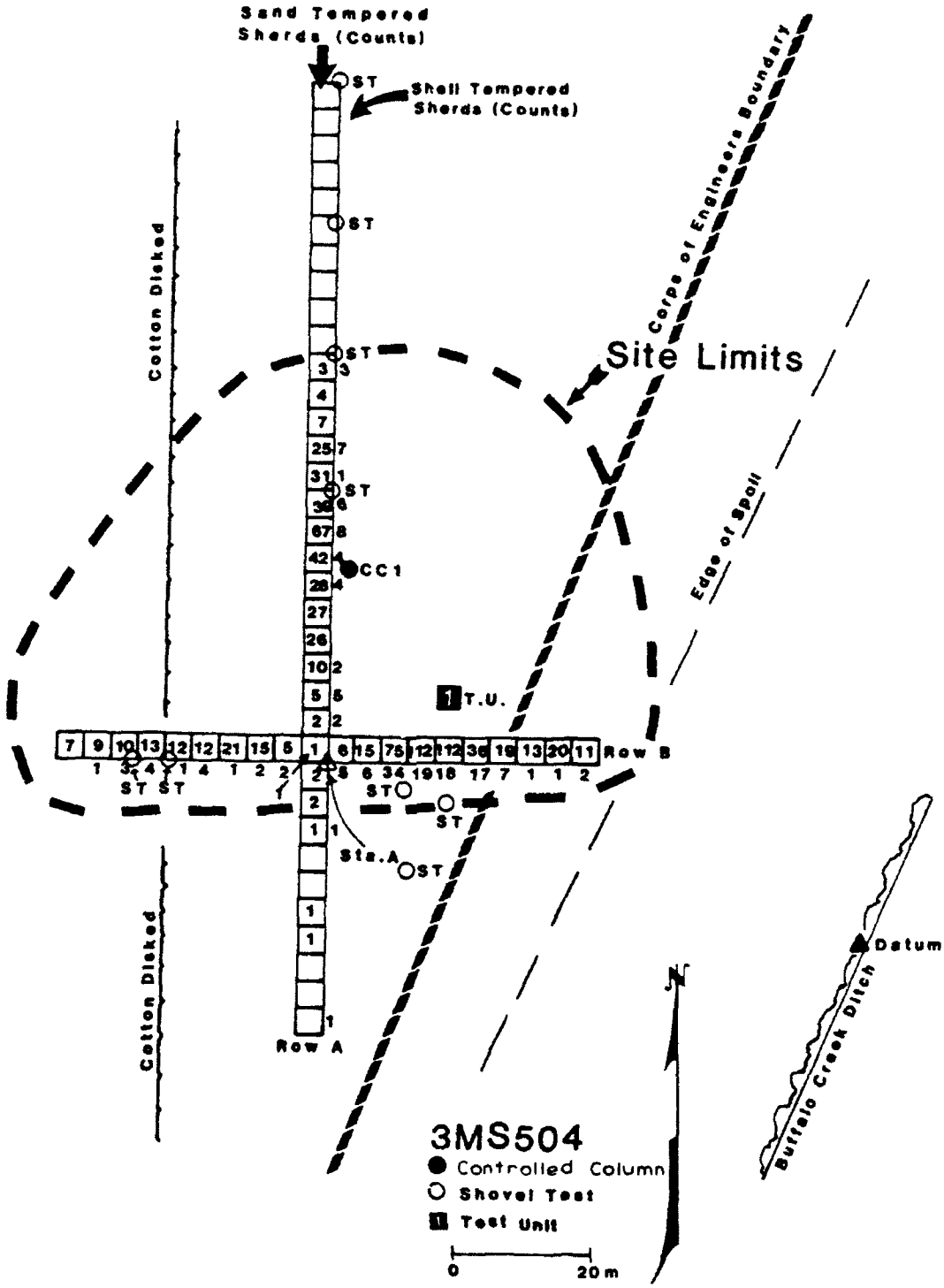


Figure 20. Site Map of 3MS504 Showing the Distribution of Ceramics in the Controlled Surface Collections.

Table 19. Lithic Artifacts Mapped on the Surface of 3MS504.

FSN	PROJECTILE POINTS
1	1 Untyped, Contracting Stem
3	1 Gary
5	1 Untyped, Side Notched
13	1 Scallorn
20	1 midsection

Table 20. Ceramics Mapped on the Surface of 3MS504.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; OTR=Old Town Red; VR=Varney Red; RS=Red Slipped; DEC=Decorated; FC=Fired Clay; P=Ceramic Particles.

LOCATION	SHELL				SAND/SHELL		SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM	DEC				
surf FSN2									1(noded)				1
surf FSN4								1	(disk)				1
surf FSN67							1						1
TOTAL							1	1	1				3

Controlled surface collection grids were laid over the site with one line covering the full length and the other placed perpendicular to the length across the densest cluster of artifacts. Between the time the grid was laid out and collected, the land manager disked the area. Besides destroying our flags, the lack of rain on the field meant that fewer artifacts were evident than observed during the initial site visit. For this reason, the actual controlled collections were postponed until the winter months and were conducted by six persons in December.

The distribution of the ceramics is shown in Figure 20. Three clusters of ceramics are apparent from these counts: one each at the east and west ends of Row B and the other in the center of Row A. Two of these contain units with very high densities of sherds. The lithic artifacts were more widely distributed with very low densities per unit. A complete listing of the artifacts collected in the controlled collections is presented in Appendix E (Tables E10 and E11).

While the controlled collections were being conducted a local collector stopped by. He reportedly had found and collected several black "arrowheads" and Barnes Cordmarked sherds

at this site. He pointed toward the west northwest and said that there used to be a mound over there, but it was leveled. He collects that area and has found sherds and arrowheads similar to the ones he had collected in this location. He reported that burials had been found at the mound site. This information suggests that 3MS504 was a village associated with a nearby ceremonial center. This site lead needs to be checked along with early aerials of the area.

Test Unit 1

Test Unit 1 was positioned in the area of the highest surficial density. The profile of this unit is shown in Figure 21. The plowzone was about 15 cm thick and it consisted of loose sand which was homogeneous in color. One unidentified animal bone fragment was collected from the 0-10 cm level. At about 16 cm below the surface the soil had a mottled appearance. Fewer artifacts were found but overall the Barnes Cordmarked sherds increased in size while the plain sherds decreased in size with depth (Table 21). A burned animal bone fragment was collected in the 10-20 cm level and an unburned animal bone was also found from 20-30 cm. Carbonized nutshells tentatively identified as hickory were collected from 30-40 cm. A preform thinning flake which has been utilized (FSN 13-1) (Plate 3h) and one burned animal bone fragment were collected from the 40-50 level. All artifacts collected in this unit are presented in Tables 22 and 23.

The sediments below the plowzone are not similar to other intact middens found at other sites during this project. However, the soil mottling is one indication of a relatively undisturbed, stable, ground surface. This characteristic combined with the the presence of cultural material including the carbonized nutshells and bone is evidence that a shallow cultural zone may remain at 3MS504. Nine additional shovel tests and one controlled column were excavated at the site in order to increase the chance of locating a feature or more definite intact deposits. The shovel tests were unsuccessful.

Table 21. Mean Ceramic Weights (grams) by Level in Test Unit 1, 3MS504.

LOCATION	COUNT BARNES PLAIN		COUNT BARNES CORDMARKED	
0-10	12	2.7	20	3.25
10-20	21	2.6	27	4.1
20-30	6	1.3	14	6.8
30-40	3	.9	1	6.5

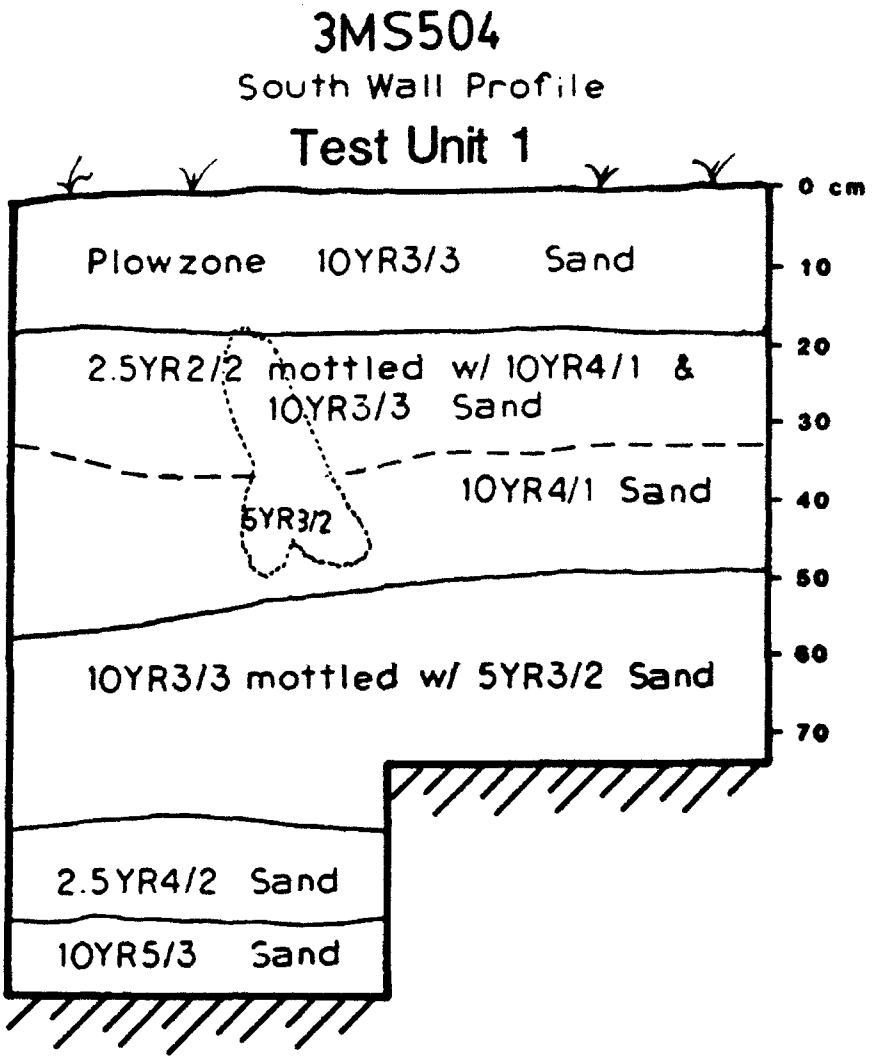


Figure 21. Profile of Test Unit 1, 3MS504.

Table 22. Ceramics Collected in Subsurface Units at 3MS504.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; CDM=Cordmarked; DEC=Decorated; FC=Fired Clay; P=Ceramic Particles; CS=Check Stamped.

LOCATION	SHELL				SAND/SHELL		SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM	DEC				
TU1 0-10							16	22				x	38
TU1 10-20							21	27			x		48
TU1 20-30							6	14					20
TU1 30-40							3	1					4
CC1 0-10							27	12	1(Wheeler CS)	1		x	41
CC1 10-20	1						4						5
CC1 20-30									1	1		x	2
TOTAL	1						77	76	1 1	2			158

Table 23. Lithics Collected in Subsurface Units at 3MS504.

ABBREVIATIONS USED: PP=Projectile Point/knife; UB=Utilized Biface;A=Adz; PRE=Preform; DR=Drill; UF=Utilized Flake; B=Biface; H=Hammerstone; AB=Abrader; C=CORES; TC=Tested Cobble; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; PT= Preform Thinning Flake; FCR=Fire Cracked Rock; UM=Unmodified Cobbles, Stones or Angular Fragments.

Test Unit 1

DEPTH	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	BT	FCR	UM	TOTAL
surf																1	1	2
0-10														3		1		4
10-20												1	1	1				3
20-30														2				2
30-40													1	1				2
50-60						1												1
TOTAL																		

Controlled Column 1

0-10														1	1			2
10-20															1	(Preform)1		
20-30																	1	1
TOTAL						1						1	2	8	2	2	2	18

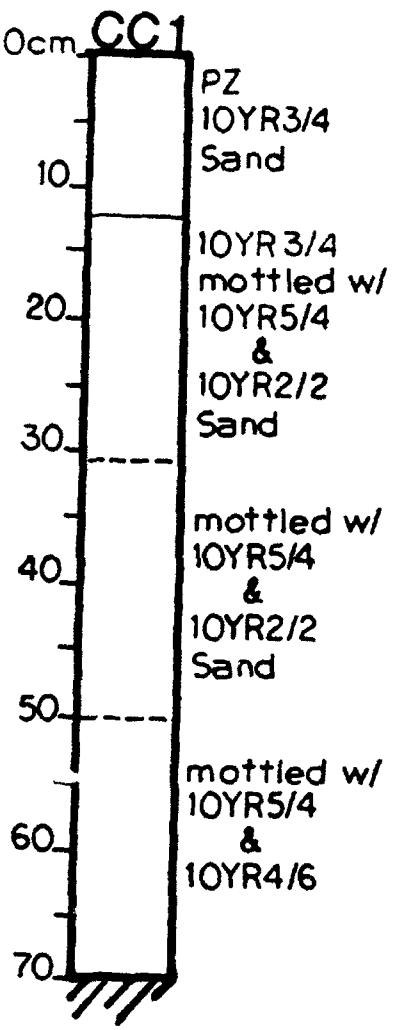


Figure 22. Profile of Controlled Column 1, 3MS504.

Controlled Column 1

Controlled Column 1 was positioned in the vicinity of an artifact cluster. It contained a plowzone to about 12 cm where the sediments changed to a more compact mottled sand. One large flat lying sand/grog tempered sherd was found in the southwest corner of the unit at 20 cm below the surface. From below 30 cm no artifacts were found and the sediments became increasingly mottled. The profile of this unit is presented in Figure 22.

Significance and Recommendations

The initial site testing at 3MS504, which included controlled surface collections, excavation of one 1 m x 1m test unit, one controlled column, and nine shovel tests, has produced information that the site is multicomponent (Late Woodland and Mississippian) and probably functioned as a small village or house site. The artifact concentrations as mapped in the surface collections probably represent locations of structures or other features. Excavations at the site have produced inconclusive evidence for the presence of significant intact deposits. Sediments, artifacts, and the organic material found below the plowzone in Controlled Column 1 and Test Unit 1 are the only characteristics suggesting that a thin midden remains at 3MS504. Additional testing is required. There is also a possibility for truncated features and midden to remain below the plowzone and for this reason the plowzone should be scraped off areas 5 m or larger in order to examine the site for features and midden. If found, they should be excavated and fully documented. It is further recommended that testing include deep subsurface units (backhoe trenches) positioned in the spoil adjacent to the ditch to determine if intact deposits were buried during previous ditch cleaning and if significant deposits will be impacted by the proposed project. Based on the results of additional work, the significance of the site should be established and a mitigation plan could be devised at that time.

3MS505

Description

3MS505 is a multicomponent site (Woodland and Mississippian) located at the juncture of the braided terrace and the braided stream fill. Lithic artifacts were observed in the field at the base of the spoil and on the west side of a small drainage ditch. The scatter measures about 80 m N-S x 40 m E-W. All artifacts were flagged and point plotted. One test unit and one shovel test were excavated at the site.

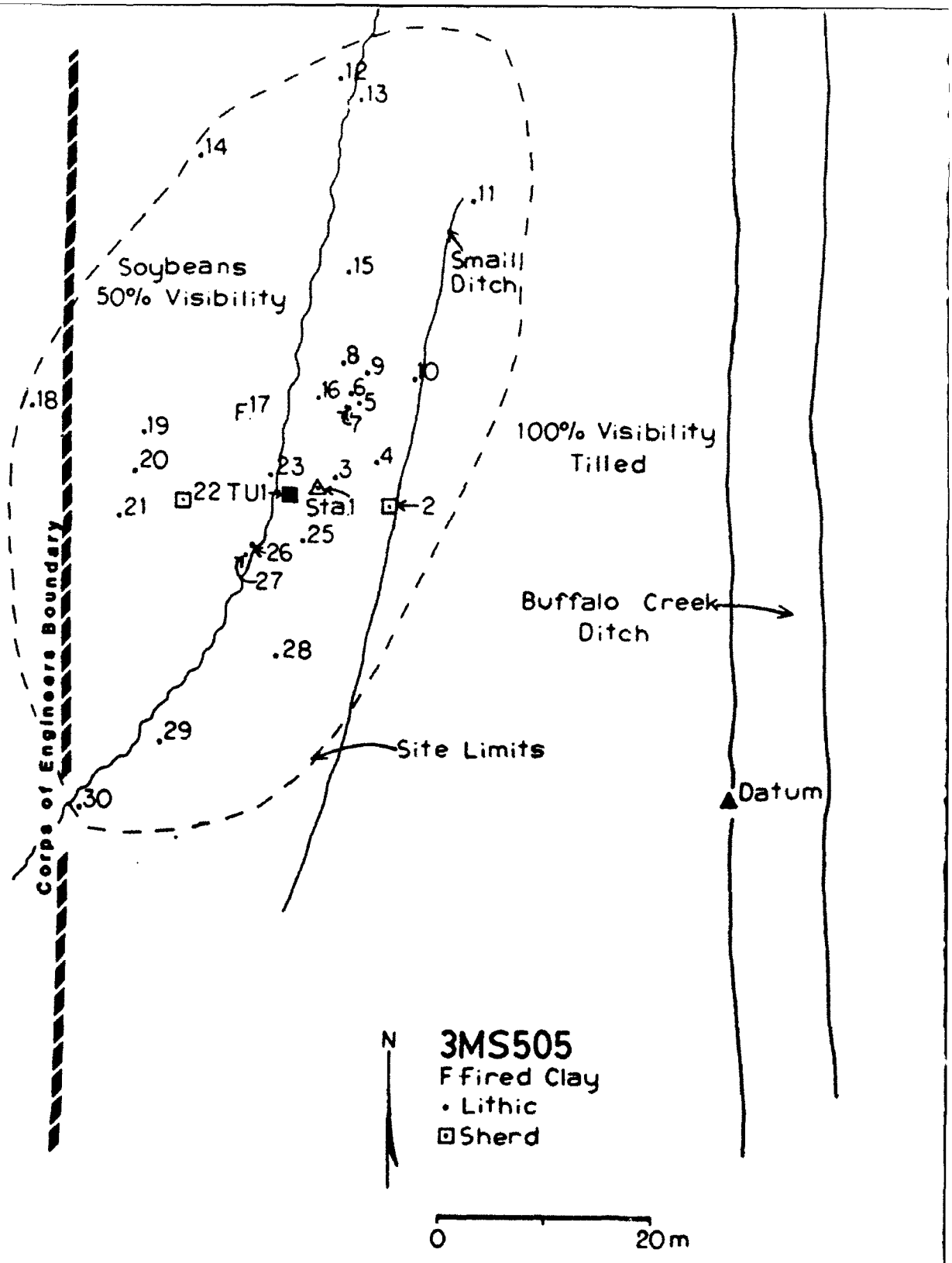


Figure 23. Site Map, 3MS505.

Surface Collections

One untyped broadly side notched projectile point fragment (FSN 1) (Plate 3f) and one side notched projectile point (FSN24, (Plate 4e) similar to the Early Archaic Cache River type (Perino 1971:14-15) were collected. Specimen FSN 1 is generally similar to expanded stem points associated with the Woodland period. FSN 2 and FSN 18 are fragments of projectile points which are not large enough fragments to be typed (Plate 3i). Two small plain sherds were also collected. One is sand/shell tempered and the other is sand tempered. Two pebble cores (FSN 29 and FSN 30) composed of Crowley's Ridge chert were found at the site (Plate 5h). One has a striking platform at opposite ends indicating a bipolar flaking technique. The platforms on the other are at right angles to each other. One chert core fragment (FSN 8) also retains two striking platforms at opposite ends indicating a bipolar flaking technique. One sandstone hammer (FSN 15) has both battered and ground surfaces (Plate 6i). Another hammerstone (FSN 28) is composed of chert and has heavy battering on two surfaces. The other artifacts collected are listed in Table 24 and plotted on Figure 23.

Table 24. Artifacts Collected at 3MS505.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; FC=Fired Clay; PP=Projectile Point; H=Hammer; C=Core; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; FCR=Fire Cracked Rock; UM=Unmodified Stone.

FSN	LOCATION	SAND/SHELL	SAND									
		PL	PL	FC	PP	H	C	PFLK	SFLK	IFLK	FCR	UM	TOTAL
1	SURF				1								1
2	SURF	1			1								2
3	SURF								1				1
4	SURF											1	1
5	SURF									1			1
6	SURF											1	1
7	SURF									1			1
8	SURF						1						1
9	SURF											1	1
10	SURF								1				1
11	SURF								1				1
12	SURF									1			1
13	SURF									1			1
14	SURF							1					1
15	SURF					1							1
16	SURF									1			1
17	SURF			1									1

FSN	LOCATION	SAND/SHELL SAND PL	PL	FC	PP	H	C	PFLK	SFLK	IFLK	FCR	UM	TOTAL
18	SURF				1								1
19	SURF										1		1
20	SURF										1		1
21	SURF									1			1
22	SURF		1										1
23	SURF								1				1
24	SURF				1								1
25	SURF									1			1
26	SURF								1				1
27	SURF									1			1
28	SURF					1							1
29	SURF						1						1
30	SURF						1						1
31	TU1 0-10									1			1
32	TU1 10-20									4			4
33	TU1 20-30								1			2	3
34	TU1 30-40										1	1	2
35	TU1 40-50								1				1
	TOTAL	1	1	1	4	2	3	1	7	13	3	6	42

Test Unit 1

Test Unit 1 was positioned in the approximate center of the surface distribution. One side notched projectile point (FSN 24) made of Burlington-like chert was found on the surface in this location. It is similar to a Cache River point except for its thickness. From 0-10 cm below the surface only one flake was collected. From 10-20 was also a plowzone level and four small interior flakes were collected. At 15 cm below the surface, four plowscars which trended northeast-southwest were observed across the unit. Only one of these remained at 20 cm and it was removed with the plowzone.

Below the plowzone the soil was mottled and contained manganese concretions (Figure 24). Two unmodified angular fragments were found in the top 6 cm of the level. One interior flake fragment, and one piece of wood charcoal were found at 30 cm. Below this level there was a coarsening of sediments. One fire cracked rock and one small natural pebble were found in the 30-40 cm level. One secondary flake was collected between 40-50 cm and charcoal was also observed in this level. The test unit was excavated down to about 70 cm and the southeast corner was dug to 90. A soil core was pushed to about 110 cm where it hit a sand which could not be penetrated. Soil was collected for pollen but due to the low probability of grains being trapped in the sands, these samples were not submitted for processing. The unit was excavated well below cultural bearing zones in order to examine whether more deeply buried cultural deposits occurred.

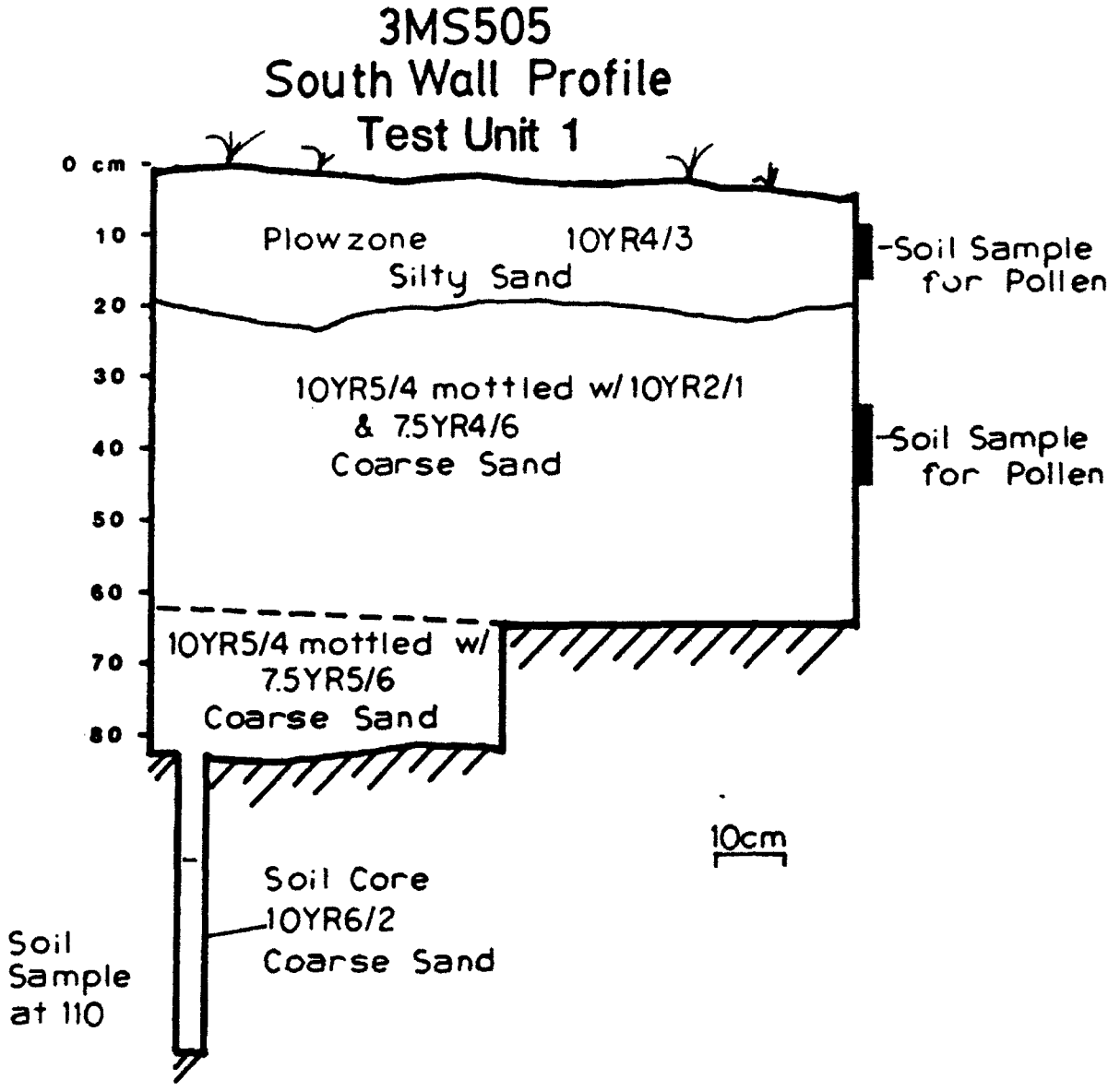


Figure 24. Profile of Test Unit 1, 3MS505.

Shovel Test 1

Shovel Test 1 was a quick but deep test unit positioned inside the small drainage ditch. It was estimated with a string and line level that the base of the ditch was about 45 cm below the surface. A shovel test inside the ditch provided another opportunity to examine the sediments for deeply buried deposits. It was excavated to at least 50 cm below the surface and the sediments observed were similar to those recorded in the test unit.

Significance and Recommendations

The artifact assemblage contained a predominance of lithics indicating that the site may have been a specialized activity site where tools were both manufactured and used. The two sherds and the typeable lithics are evidence of Early Archaic, Late Woodland, and Early Mississippian cultural affiliation. No obvious intact cultural levels were identified, but the origin of the artifacts could be cultural deposits remaining beneath the plowzone between 30-50 cm below the surface. Because 3MS505 is a specialized activity site containing a predominance of lithic artifacts and because there is a chance for intact material and organic remains, the site needs additional testing to determine its significance.

3MS506

Description

At the time of discovery, this site consisted of a small scatter of Barnes sherds which measured roughly 25 m in diameter and was located on the east side of Buffalo Creek Ditch. It lay in a fallow field which was covered in high, thick weeds where surface visibility was poor, only about 30%. One shovel test was excavated and contained numerous sherds. The distribution of the artifacts was mapped but no material was collected. On a second visit to the site a permanent datum was established and a test unit was positioned in the center of the site near the shovel test. The plowzone and the first few centimeters of an intact midden below was excavated. The unit was temporarily abandoned because of the dry compact nature of the intact deposits.

In the winter of 1987, 3MS506 was visited for a third time and the surface visibility of the site was improved, about 75%. All artifacts, which consisted of Barnes ceramics, a few flakes, and one small projectile point tip made of Crowley's Ridge chert, were flagged; and the distribution was mapped with a transit and tape. The site was found to be much larger than previously recorded and now extended 70 m N-S x 45 m E-W (Figure 25). All of the cultural material was located in the field below the ditch spoil, but there is a possibility that the site continues westward under the spoil and toward the ditch. The test unit was reopened and a 40 cm thick midden extends from below the plowzone to about 60 cm below the surface.

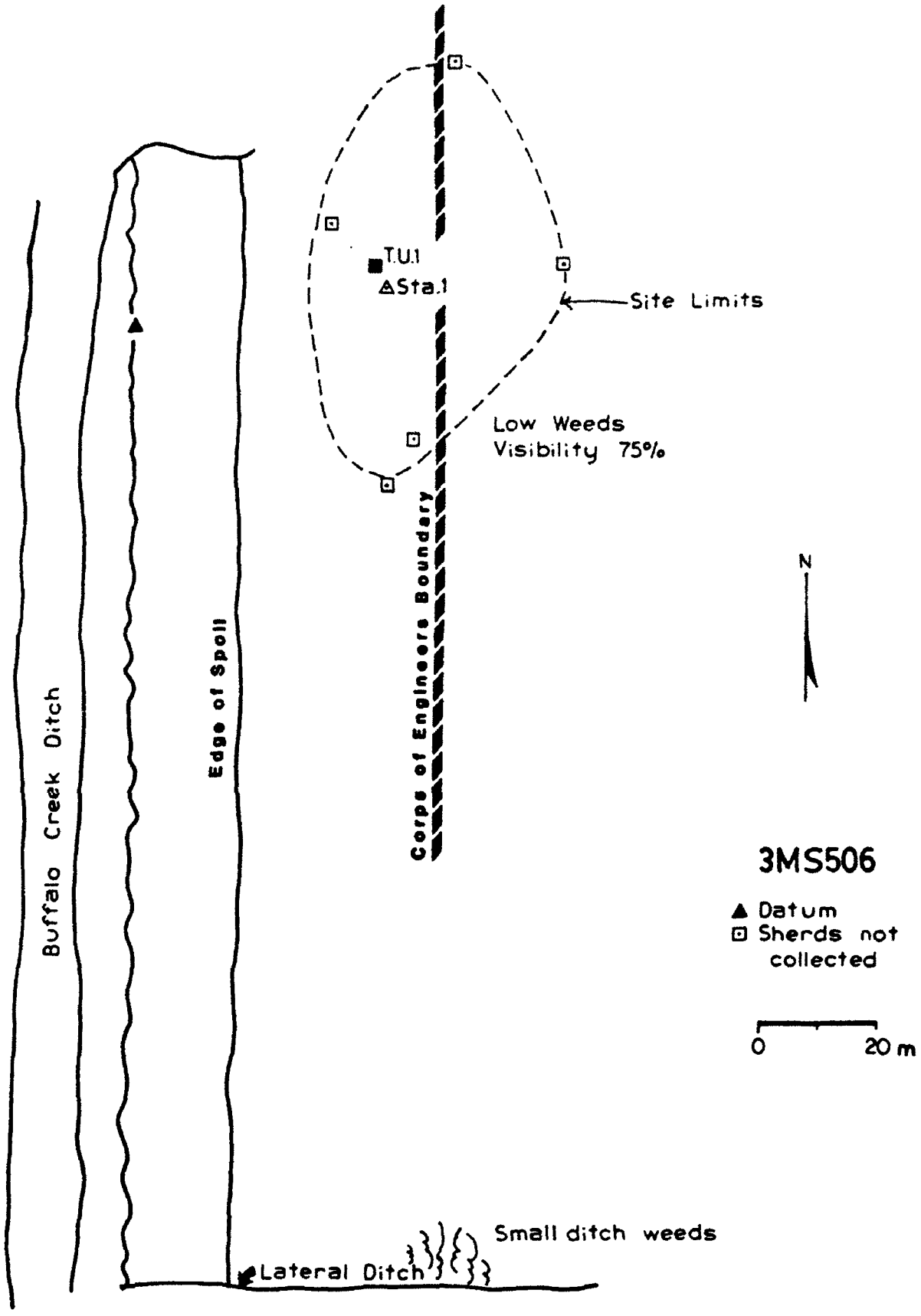


Figure 25. Site Map, 3MS506.

Test Unit 1

During the summer of 1986, the plowzone was excavated in two 10 cm levels and the soil consisted of a loose sandy loam which was easy to screen. From 10-20 the sediments were more compact and shovel skimming tended to slice more easily through the sherds than the sediments. At the base of the second level a dark midden containing large sherds and fired clay fragments was evident (Figure 26). One area of burned clay was also observed. The unit was terminated at the top of the midden. In the winter of 1986, Test Unit 1 was reopened and the excavation of the midden continued. Adequate soil moisture had returned by this time and sediment colors were good and the soil was easier to screen.

A high density of sherds was collected from 20-30 cm (Table 25). At the base of this level a dark stain designated as Feature 1 and the bottom portion of several very distinct plowscars were apparent. These were excavated separately.

From 30-40 cm numerous Barnes sherds were collected and one small burned animal bone was collected. Feature 1 extended to 37 cm and as shown in the wall profile (Figure 27), it was a small bell shaped pit, probably used for storage. From 40-50 cm there was a slight decrease in the number of sherds, but several of these were very large and were lying flat. One fragment of burned bone was collected. From 50-60 cm the sediments began to lighten in color and artifacts decreased, but small fragments of wood charcoal and several lithics were collected (Table 26). From 60-70 cm the assemblage collected was much the same except that fewer ceramics were collected. One fragment of burned animal bone was found. No features were observed. Due to the difficulty of both standing in and excavating such a small unit to a great depth, from 70-80 cm only the northern 1/2 of the unit was excavated and no artifacts or feature stains were found. The northwest 1/4 of Test Unit 1 was excavated to one meter below the surface. One sherd each was collected in the two lower 10 cm levels. These could have been transported downward by roots such as those mapped in the wall profile (Figure 27). Sediments from this test unit were analyzed and grain size distributions indicated that these are braided stream channel fills.

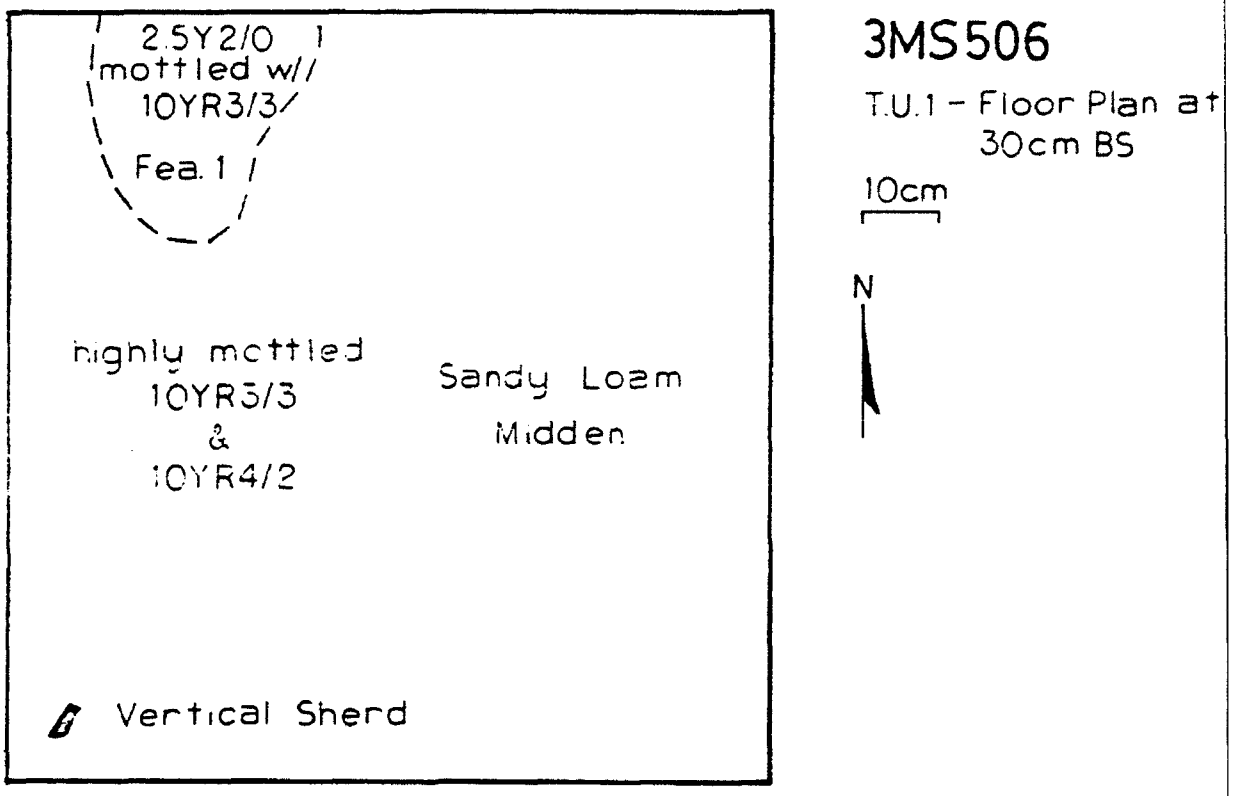


Figure 26. Floor Plan View of Test Unit 1 at 30 cm, 3MS506

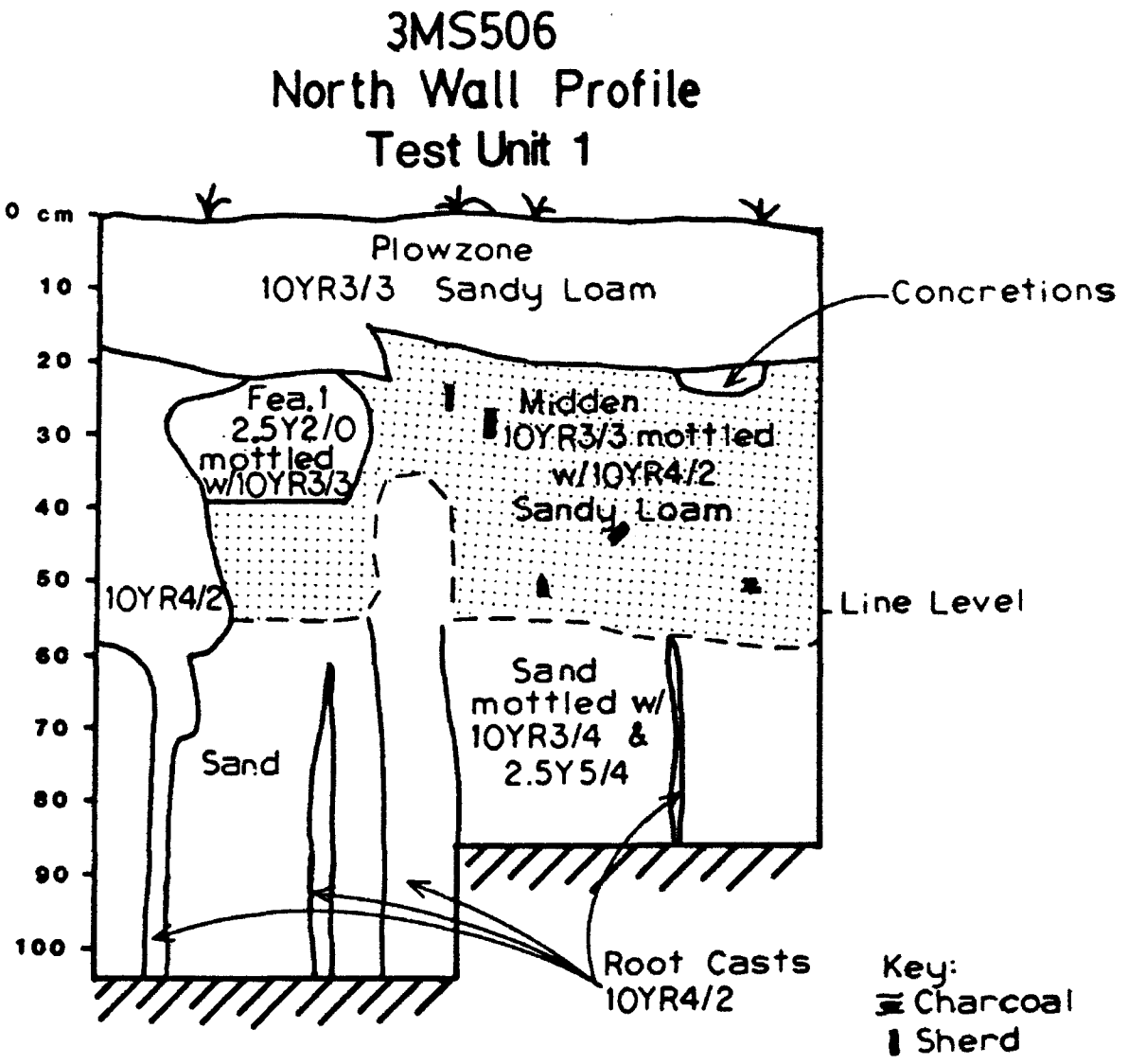


Figure 27. Profile of Test Unit 1, 3MS506.

Table 25. Ceramics Collected in Test Unit 1, 3MS506.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; CDM=Cordmarked; FC=Fired Clay; P=Ceramic Particles.

LOCATION	SHELL				SAND/SHELL		SAND			SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM	DEC					
TU1 0-10	1						19	18					x	38
TU1 10-20				1			18	21				x	x	40
TU1 20-30	2						24	51				x	x	77
TU1 F1 20-30								1						1
TU1 F1 30-37							1							1
TU1 30-40							11	37	(1 abrader)			x	x	49
TU1 40-50							22	34				x	x	56
TU1 50-60							10	35				x	x	45
TU1 60-70							4	19				x	x	23
TU1 80-90							1							1
TU1 90-100								1						1
TU1 mapped in North Wall								4						4
TOTAL	3			1			110	221	1					336

Table 26. Lithic Artifacts Collected in Test Unit 1, 3MS506.

ABBREVIATIONS USED: PP=Projectile Point/knife; UB=Utilized Biface;A=Adz; PRE=Preform; DR=Drill; UF=Utilized Flake; B=Biface; H=Hammerstone; AB=Abrader; C=CORES; TC=Tested Cobble; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; PT= Preform Thinning Flake; FCR=Fire Cracked Rock; UM=Unmodified Cobbles, Stones or Angular Fragments.

DEPTH	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	PT	FCR	UM	TOTAL
0-10												1	1	1		2	1	6
10-20													2	1				3
20-30														1			1	2
30-40						1								1	1	1		4
40-50														2				2
50-60													1	2			2	5
TOTAL						1						1	4	8	1	3	4	22

Significance and Recommendations

3MS506 is a single component Barnes site which contains a deep intact midden containing a high density of artifacts and some organic remains such as bone and carbonized wood. The site is clearly significant and eligible for nomination to the National Register of Historic Places. Further testing to collect information on the boundaries of the subsurface deposits is recommended in order to complete the National Register documentation. it is likely that the site continues under the spoil and deep subsurface testing such as coring or backhoe trenches will be necessary to locate and map the deposits. Upon completion of these investigations a management plan for the site should be developed. If the site cannot be preserved, then the impact of the proposed project should be mitigated.

3MS507

Description

3MS507 is a Late Woodland and Early Mississippian site which was first discovered in a soybean field which had little to no surface visibility (Figure 28). At that time only one small plain sand tempered sherd was found at the site. Exhausting attempts were made to part the vegetation, which was over head high, in order to examine small patches of ground beneath the mature crop. A return visit was made to the site during the winter months when there was 100% visibility. Investigations at the site included re-examination of the surface, site mapping, and the excavation of two controlled columns and one shovel test. Permission for excavating larger units was not obtained.

The surface material was distributed on a prominent rise which trended southwest (Area A) and was bisected by a low area. Area B was another smaller rise where a shell tempered red filmed sherd and other sherds were found. The density of material on the surface of the site was low and the artifacts, mostly small sand tempered sherds, were dispersed (Table 27). The most material was observed on the farm road. Between FSN 5 and 8 shown in Figure 28, fourteen small Barnes sherds were observed. FSN 4 was a hammerstone (Plate 6j) composed of a fine grained sandstone. It had battering on all acute edges. FSN 5 and FSN 6 are Barnes sherds and FSN 6 is a bifacial endscraper (Plate 2f). FSN 8 is a sand/shell tempered sherd. In general, the site is mapped as 110 m N-S x 150 m E-W.

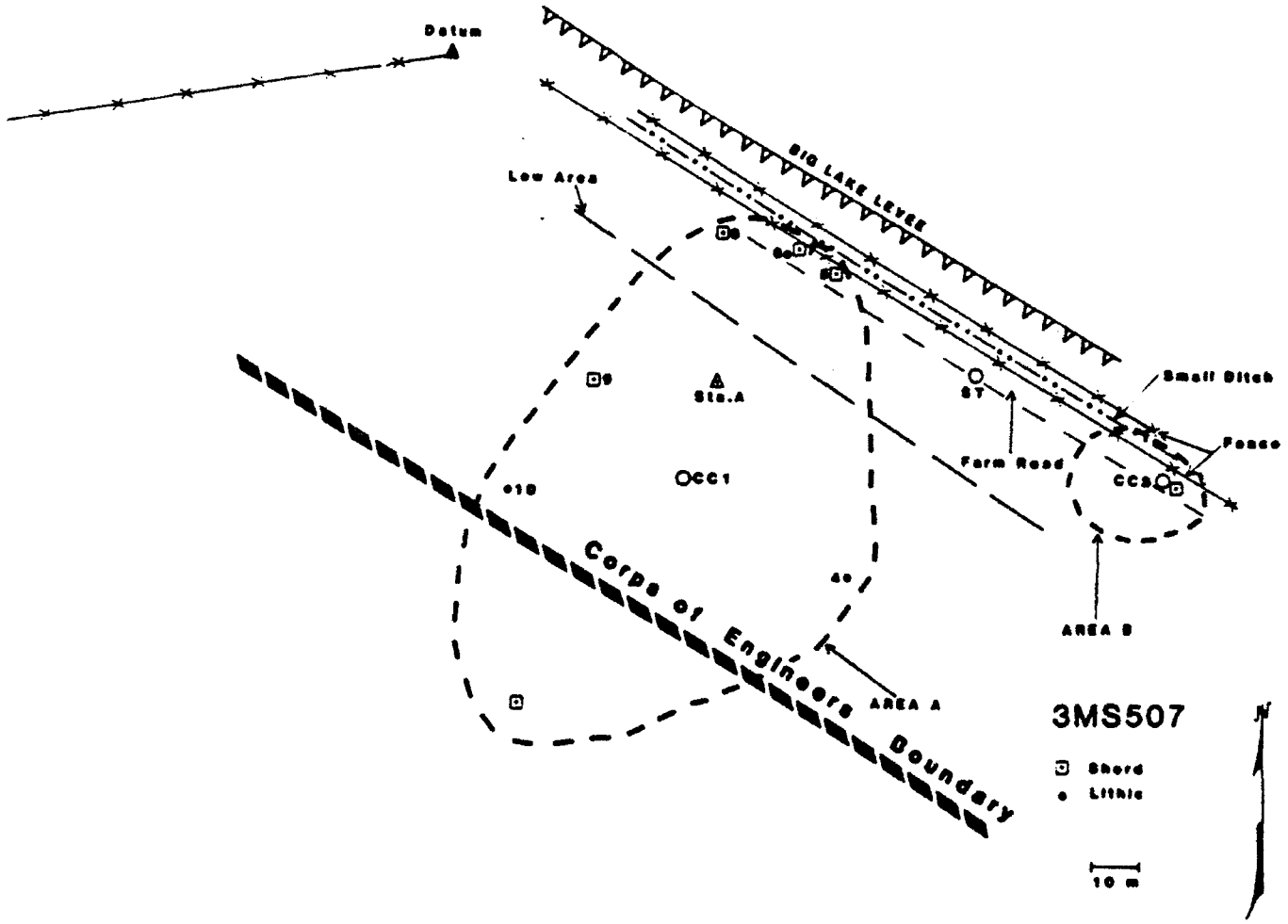


Figure 28. Site Map, 3MS507.

Table 27. Artifacts Collected at 3MS507.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; RS=Red Slipped; CDM=Cordmarked; UB=Utilized Biface; H=Hammerstone; C=Core; SFLK=Secondary Decortication Flake.

LOCATION	SHELL			SAND/SHELL			SAND		UB	H	C	SFLK	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
surf FSN1							1						1
surf FSN4										1			1
surf FSN5							1						1
surf FSN6									1				1
surf FSN7				1			1	1					3
surf FSN8					1		1						2
surf FSN9							1						1
surf FSN10											1		1
CC1 0-25							5					1	6
CC1 25 below PZ							2						2
TOTAL				1	1		12	1	1	1	1	1	19

Controlled Column 1

Controlled Column 1 was positioned on the top of the rise in Area A. Artifacts were found in the top plowzone level. Two Barnes sherds were in the top of the next level, but no obvious intact cultural sediments were observed in this unit. The profile of Controlled Column 1 is shown in Figure 29.

Controlled Column 2 and a Shovel Test

Controlled Column 2 was placed in the farm road in the vicinity of Area B. Cultural material was only found in the top plowzone level. A suspicious dark sediment was found from 25 to 50 cm below the surface where the unit was terminated; however, it did not contain cultural material or other characteristics of a midden. The profile of this unit is shown in Figure 29. A shovel test was also quickly excavated in the road north of this controlled column, the darker sediment was not apparent and again no cultural material or stratum was observed.

Significance and Recommendations

In these limited investigations, no obvious intact deposits were found at the site; however, given that the artifacts indicate a Late Woodland and Early Mississippian occupation, it is likely that somewhere in this large area intact features and

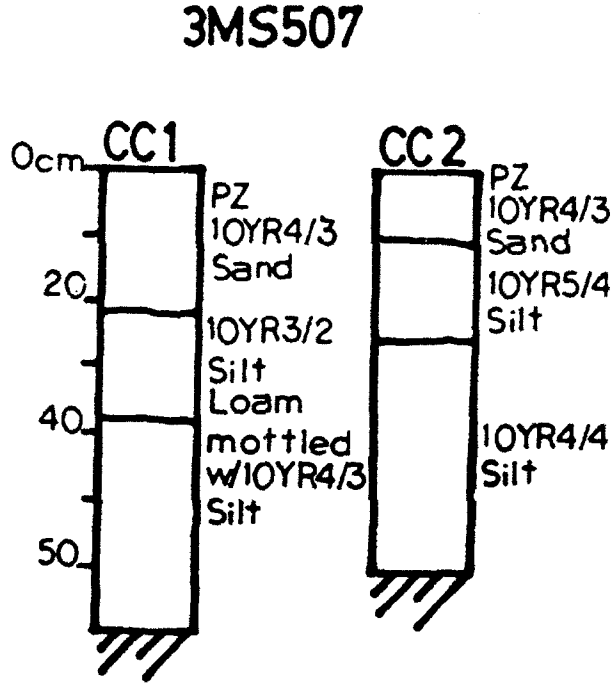


Figure 29. Profile of Controlled Column 1 and 2, 3MS507.

areas of intact midden remain. In addition, the levee and the ditch spoil may have buried intact portions of the site. There is also the possibility that material found in this location is associated with 3MS25 which lies on the east side of the levee. This site, known as Cottonwood Point, was a historic community from 1880-1930. It was also a well known prehistoric site allegedly collected and pot hunted. Portions of it were destroyed during levee construction. Dr. Dan Morse conducted limited salvage excavations, and in the five units excavated, he exposed two deep storage pits. Artifacts found indicated an intensive year round settlement during both the Late Woodland and Mississippian periods. Further salvage work was recommended at 3MS25, but it was never conducted.

Additional testing is recommended at 3MS507 to examine whether intact features and middens remain. The testing program should include removal of the plowzone in fairly large blocks to determine if truncated features remain. If found, they should be excavated and documented fully. The testing program should also include backhoe trenches in order to determine if more deeply buried deposits remain and to better understand the geomorphology of the area. Based on the results of testing, a mitigation plan, if necessary, could be developed for the site.

3PO499

Description

When 3PO499 was first discovered by SPEARS in August, 1986, the site was planted in close-drilled soybeans with only 20% visibility. Shell tempered, sand tempered, and grog tempered ceramics were observed on the surface and a sketch map was made of the apparent site limits. Because of the poor visibility, no surface collection was made.

The site was revisited two weeks later, at which time a transit map was drawn (Figure 30), and a 1 m x 1 m test unit was begun. This test unit was excavated only to the base of the plowzone. The soil was extremely dry and compact, but due to a high density of material in the level below the plowzone, a midden was apparent. Because sherds were being damaged during removal from the compact sediments and because no features or soil color changes could be detected in the extremely dry soil even after the unit was sprayed with water, excavation of this test unit was temporarily discontinued at the base of the plowzone. A shovel test, which was also abandoned at a depth of 30 cm. showed that the dry conditions but culturally rich sediments prevailed elsewhere on the site.

In February, 1987, the site was visited again. The beans had been harvested, the site disked, and wheat planted. An attempt to relocate the first test unit was unsuccessful, and a new 1 m x 1 m unit was opened near the mapped location of the earlier test unit. Although surface visibility was about 85% in

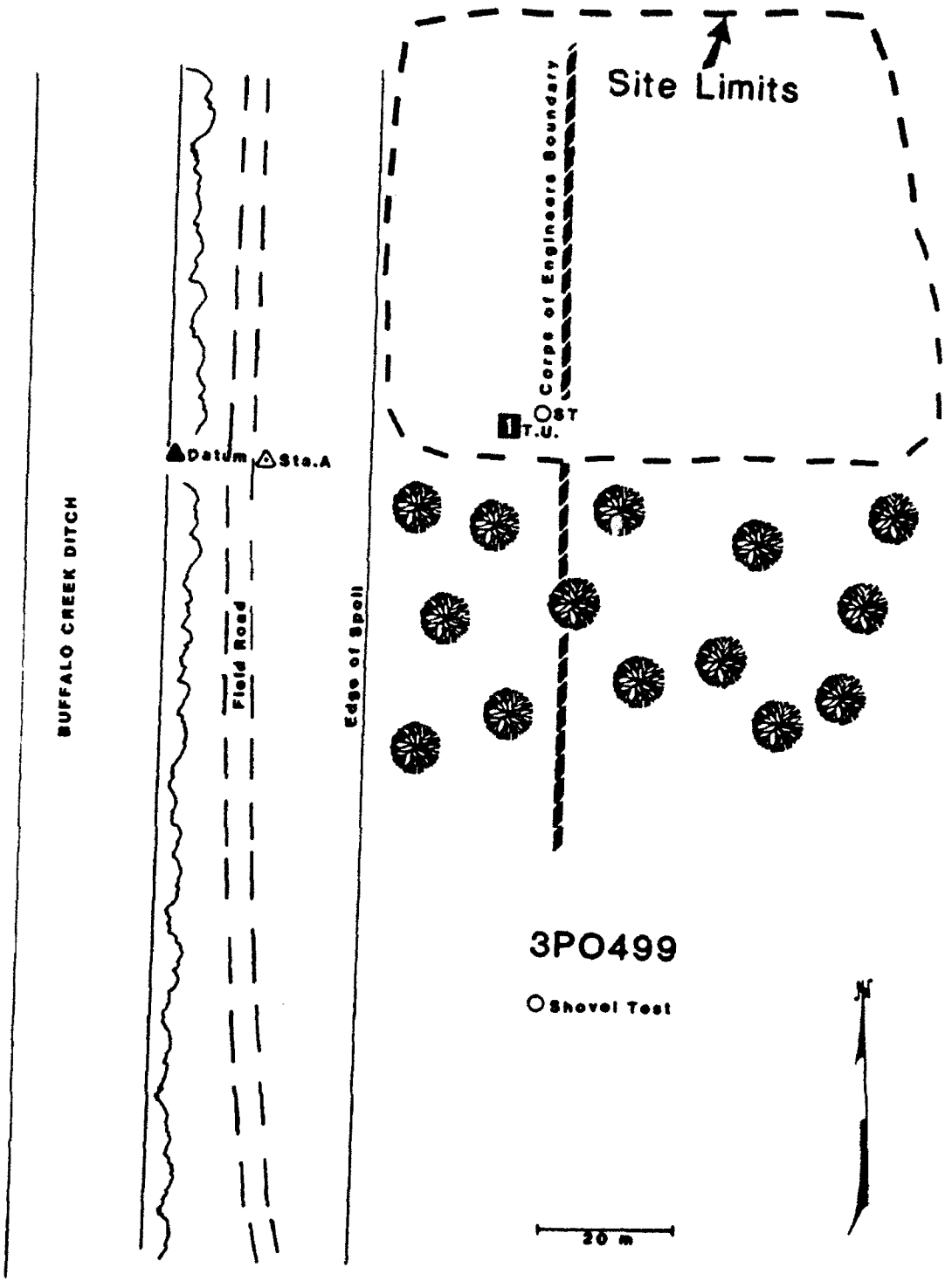


Figure 30. Site Map, 3PO499.

the young wheat, very few artifacts were visible on the ground surface that had been flattened by heavy rains. No surface collection was made but the the distribution of artifacts was the same as observed in August with dimensions of about 75 m x 75 m. The surface distribution ended abruptly on the west at the spoil from Buffalo Creek Ditch, indicating that part of the site is beneath the spoil. No artifacts were found on the spoil.

Shovel Test 1

Because the test unit begun in August could not be completed, a shovel test was excavated to gain some additional information. However, it was apparent that no artifacts could be recovered undamaged from the shovel test and that no stratigraphic information could be obtained from the extremely dry, compact soil. This shovel test was abandoned at 30 cm deep.

Test Unit 1

The plowzone excavated in August contained both prehistoric ceramics and mid-twentieth century artifacts. The historic artifacts included unidentified metal, clear glass, plastic, and a .22 caliber cartridge (Table 28). Among the prehistoric ceramics were one sherd tempered with both grog and shell and one sherd tempered with grog.

Table 28. Historic Artifacts Collected in Test Unit 1, 3PO499.

FSN#	Provenience	Metal	Clear Glass	Other	TOTAL
1	0-10	3	5		8
2	10-20	1	8	1 cartridge, .22 caliber	10
3	20-25		3	1 celluloid fragment	4
5	20-30	3	7		10
6	20-30		2		2
11 Fea. 1	60-70		1 tiny,	thin	1
TOTAL		7	26	2	35

With better soil conditions during the February excavations, it was apparent that two plowzones were present (Figure 31), with chisel plow scars visible to 38 cm. The farm manager visited the site during the excavation and provided information to corroborate the field interpretations. He had last chisel plowed the field one year earlier, and had consistently pulled the ditch spoil into the field, burying the older plowzone. No historic artifacts were found in the lower plowzone, and those in the upper plowzone may have originated in recent trash dumps along the ditch.

3PO499
Test Unit 1
South Wall Profile

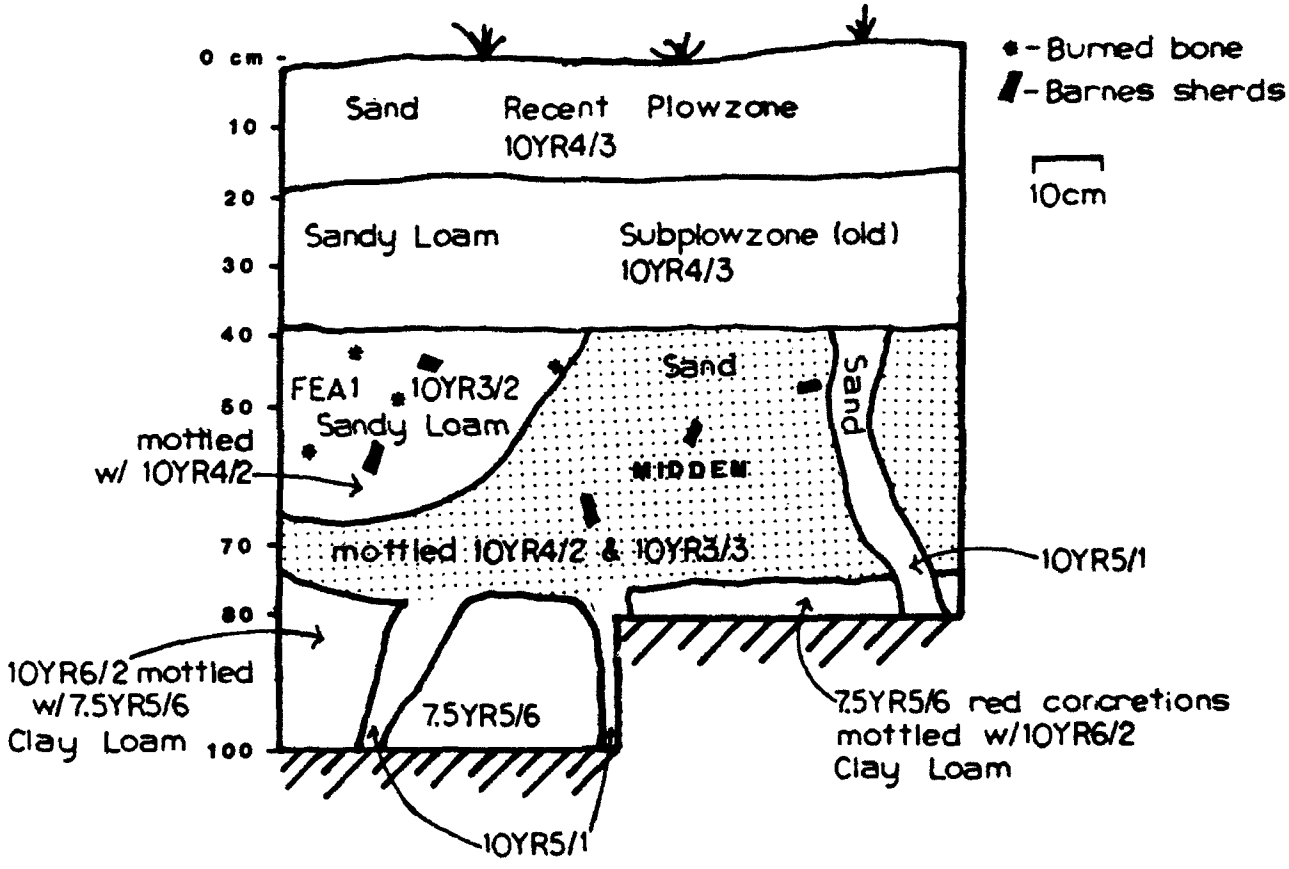


Figure 31. Profile of Test Unit 1, 3PO499.

Below the plowzone was a highly mottled, intact stratum. This level contained larger sherds in a higher density than had been recorded in the plowzone (Table 30). The percentage of sherds containing shell tempering (including sand/shell combinations) was 29.6% from 20 to 30 cm and 30.6% from 30 to 40 cm. However, the percentage dropped to 8.8% in the level from 40 to 50 cm. Only six sherds containing shell were found below 50 cm, and at least two of these were in an intrusive feature. Sand tempered sherds were found in relatively high frequencies to 70 cm deep. These counts suggest that the Mississippian and Woodland components at 3PO499 are stratigraphically separate although no distinct boundaries were apparent in this one test unit. The deposits are undisturbed as shown by the increase in sherd size with depth (Table 29).

Table 29. Mean Ceramic Weights (grams) by Levels in Test Unit 1, 3PO499.

ABBREVIATIONS USED: Ceramics listed by temper. CT=Count; RS=Red Slipped.

LOCATION	SHELL				SAND/SHELL		SAND			
	CT	PLAIN	CT	RS	CT	PLAIN	CT	PLAIN	CT	CORDMARKED
20-30	13	1.4			1	3.8	27	1.9	7	2.7
30-40	38	2.0	3	3.1	3	2.4	70	2.7	20	3.6
40-50	21	2.2			2	5.0	119	2.8	121	5.9
50-60	1	1.0					82	3.0	38	4.5
60-70					1	.5	47	2.9	27	3.8
70-80(S1/2)					1	3.0	2	2.0	2	4.3

Very few lithic artifacts were found (Table 31). These were mostly Crowley's Ridge chert, although a biface thinning flake and a preform thinning flake were identified as Burlington-like chert. Both of these two flakes were found from 40 to 50 cm deep in Test Unit 1. This level contained a greater number of lithics than any other, including a core of Crowley's Ridge chert (FSN 7-14) (Plate 5g).

At 50 cm a dark stain in the southeast corner was identified as an intrusive pit and excavated separately as Feature 1 through the next two levels. This feature contained bits of charcoal and burned bone and at least two shell tempered sherds. It was probably a refuse-filled Mississippian pit.

The north half of Test Unit 1 was excavated to 70 cm. The southwest quarter was excavated to 80 cm, and the southeast quarter was excavated to 100 cm. No artifacts were found below 80 cm, and the sediments became finer textured with depth. The deposits in this unit were analyzed for grain size and these sediments are interpreted as braided stream channel fills.

Table 30. Ceramics Collected in Test Unit 1, 3PO499.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; RS=Red Slipped; CDM=Cordmarked; FC=Fired Clay; P= Ceramic Particles.

FSN	LOCATION	SHELL		SAND/SHELL		SAND		GROG/SHELL	GROG	FC	P	TOTAL
		PL	RS	PL	RS	PL	CDM					
1	TU1 0-10	2		3	1	33	16					55
2	TU1 10-20	2		5		33	12	1				52
3	TU1 20-25	1				9			1	2		13
4	TU1 0-20	1				2	6			2		11
5	TU1 20-30	13		1		27	7				X	48
6	TU1 30-40	39	2	3		71	22			18	X	155
7	TU1 40-50	22		2		120	129			78	X	351
8	TU1 50-60	1	1			86	39			13	X	140
9	TU1 50-60F1			1		6	7			4	X	18
10	TU1 60-70			1		49	27			8	X	85
11	TU1 60-70F1	1					1			8	X	10
12	TU1 70-80			1		2	2					5
13	TU1 70-80F1					1	1			1	X	3
14	TU1 S.Wall	1				1	1					3
15	TU1 S.Wall					2						2
	TOTAL	83	3	17	1	442	270	1	1	134		951

Table 31. Lithics Collected in Test Unit 1, 3PO499.

ABBREVIATIONS USED: O=Other; B=Biface; C=Core; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake: IFLK=Interior Flake; FCR=Fire Cracked Rock; UNMOD=Unmodified Rock or Stone.

FSN	LOCATION	O	B	C	PFLK	SFLK	IFLK	FCR	UNMOD	TOTAL
3	TU1 20-25						2		6	8
4	TU1 0-20				1					1
6	TU1 30-40		1			1		2		4
7	TU1 40-50	2		1			1	2	1	7
8	TU1 50-60								1	1
10	TU1 60-70						1	1		2
	TOTAL	2	1	1	1	1	4	5	8	23

Significance and Recommendations

Both Mississippian and Late Woodland components are present at 3PO499. Due to the lack of temporally diagnostic shell tempered sherds, no accurate temporal placement can be assigned to the Mississippian component. However, a few sherds with red slipped exteriors and a low frequency of sherds with a combination of sand and shell tempering are compatible with Middle Mississippian assemblages. Since cordmarking is the only decoration on the sand tempered sherds, these artifacts have been assigned to the Late Woodland period. The fact that 3PO499 contains intact deposits and features renders it significant and eligible for nomination to the National Register.

There was no evidence of pre-ceramic components. The few lithic artifacts recovered are all compatible with Woodland and Mississippian assemblages, although none are diagnostic.

The farm manager believed no historic house had been located on this site, and his removal of spoil to the field could account for all of the historic artifacts found in the plowzone. These artifacts were restricted to the upper of the two plowzones identified in Test Unit 1, and this upper plowzone was primarily composed of relocated spoil. Recent trash is common on the spoil along Buffalo Creek Ditch and adjacent to all farm roads.

The western edge of the distribution of prehistoric artifacts on the surface coincided with the eastern edge of the spoil along the ditch. Some part of 3PO499 is probably buried beneath the spoil. However, since no artifacts were observed on the spoil, it is unlikely that the site extends as far west as the bank of Buffalo Creek Ditch. Additional testing to determine the subsurface boundaries is recommended at this site. Subsequent to these investigations a management plan should be developed for the site. If the deposits cannot be avoided by the proposed project then mitigation will be necessary.

3PO500

Description

This site had been planted in close-drilled soybeans when it was discovered, and visibility was only 20%. The surface distribution of prehistoric artifacts included both shell tempered and sand tempered sherds in an area about 58 m x 45 m (Figure 32). The western edge of this distribution was about 55 m east of Buffalo Creek Ditch, but may have been obscured by spoil from the ditch. Because of the poor visibility, no surface collection was made.

Test Unit 1

One 1 m x 1 m meter test unit was excavated. It was located near the center of the observed surface distribution (Figure 32).

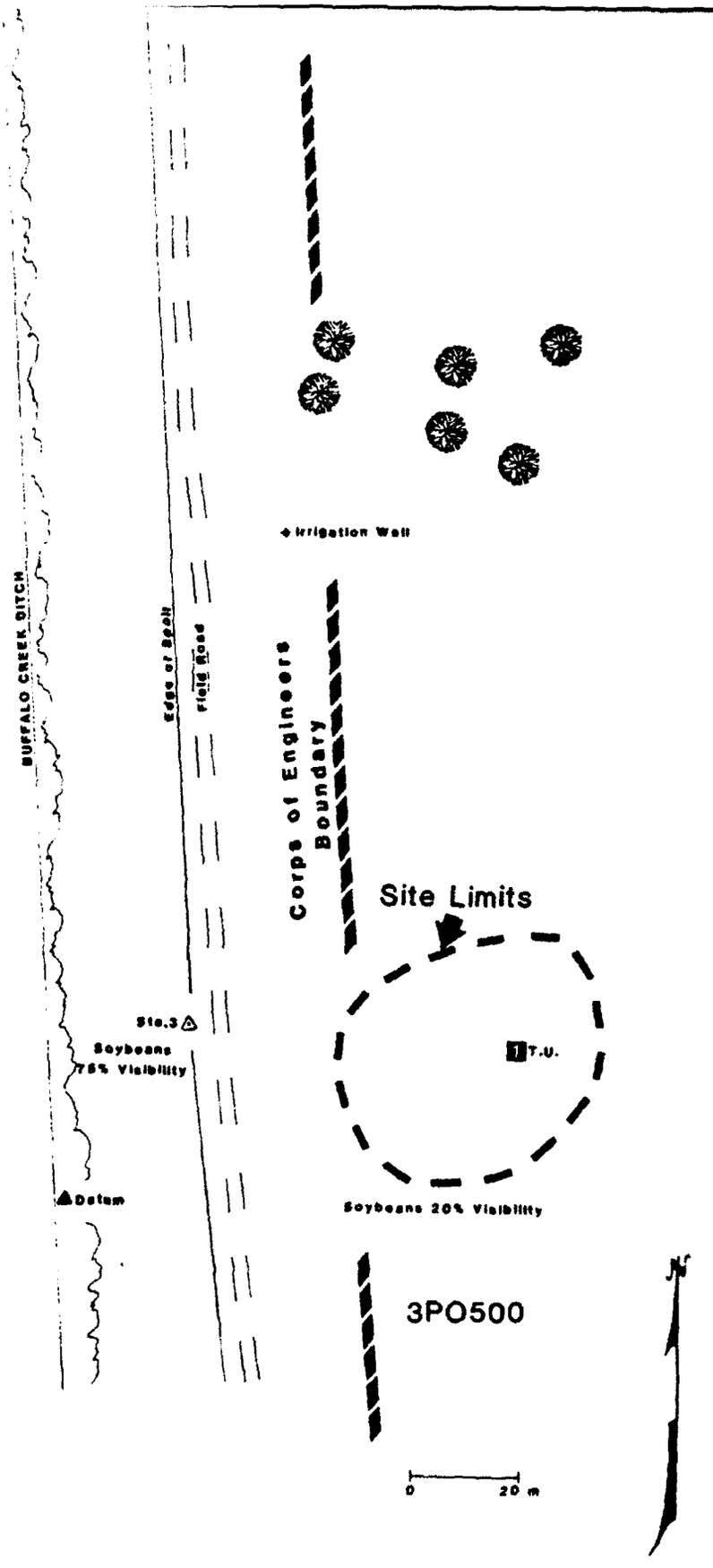


Figure 32. Site Map, 3PO500

The plowzone was excavated in two levels. The lower of the two plowzone levels contained a higher frequency of artifacts (Table 32), but this level was thicker than the upper level. After excavating the second 10 cm level in the plowzone, the base of the plowzone was discovered at about 24 cm. The artifacts from 20 to 24 cm were added to the artifacts collected at 10 to 20 cm. Among the artifacts collected in the plowzone were two grog tempered sherds, one of which was cordmarked, and one sherd with both shell and grog tempering. Most of the sherds in the plowzone were sand tempered, some with cordmarking. However about 33%, including four red filmed sherds, had shell tempering or a combination of sand and shell tempering. Five lithic artifacts, including one preform thinning flake, were also found in the plowzone (Table 33).

Table 32. Ceramics Collected in Test Unit 1, 3PO500.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; OTR=Old Town Red; CDM=Cordmarked; FC=Fired Clay; P= Ceramic Particles.

FSN	LOCATION	SHELL		SAND/SHELL	SAND		GROG/SHELL	GROG		FC	P	TOTAL
		PL	OTR		PL	CDM		PL	CDM			
1	TU1 0-10	19	1	5	39	11		1	1	3	X	80
2	TU1 10-24	45	3	5	76	28	1			7		165
3	TU1 24-35	35		15	38	23			1	34	X	146
4	TU1 35-45	5		5	10	27				9		56
5	TU1 45-55				12	14				3		29
6	TU1 55-65			2	3	1				4		10
7	TU1 65-75				1							1
TOTAL		104	4	32	179	104	1	1	2	60		487

Table 33. Lithics Collected in Test Unit 1, 3PO500.

ABBREVIATIONS USED: PFLK=Primary Decortication Flake; IFLK= Interior Flake; FCR=Fire Cracked Rock; PF=Preform Thinning Flake; UNMOD=Unmodified Stone.

FSN	LOCATION	ADZ	PFLK	IFLK	FCR	PF	UNMOD	TOTAL
1	TU1 0-10		1		1	1	1	4
2	TU1 10-24			1				1
3	TU1 24-35			1	1		1	3
4	TU1 35-45	1						1
	TOTAL	1	1	2	2	1	2	9

3P0500
South Wall Profile
Test Unit 1

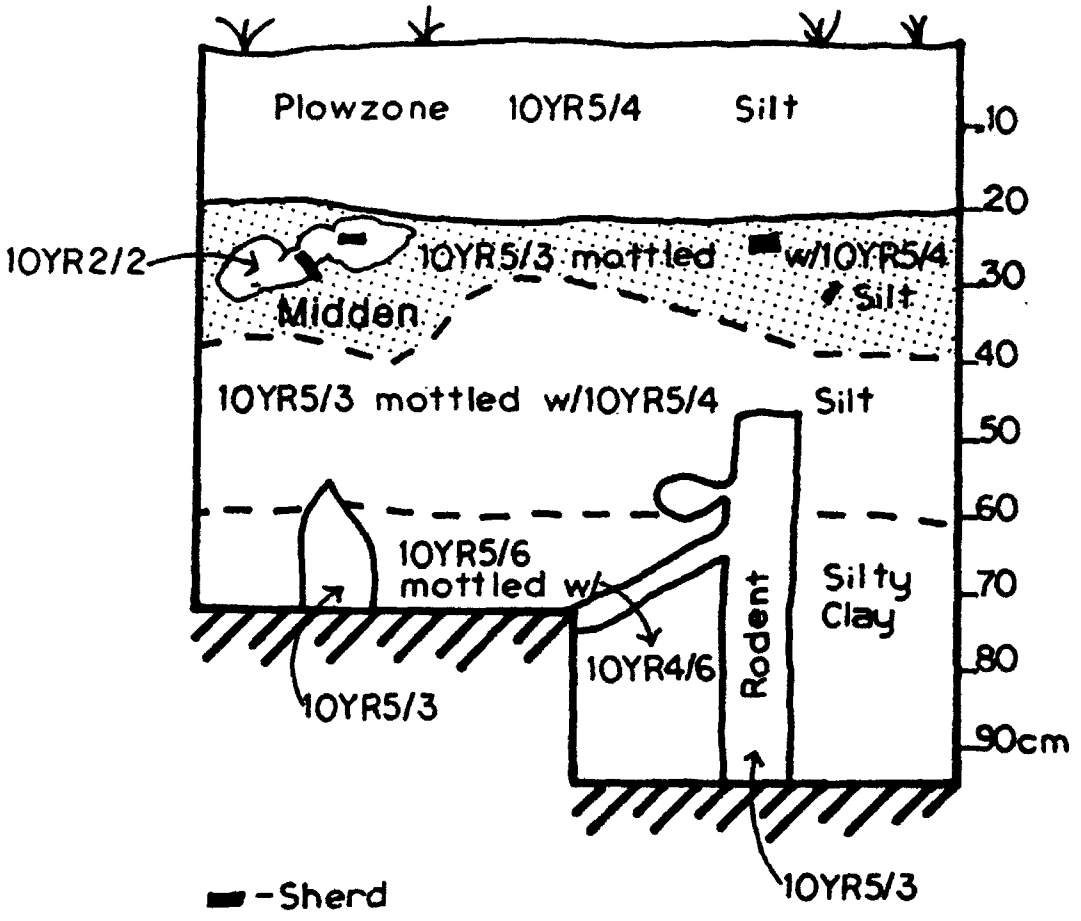


Figure 33. Profile of Test Unit 1, 3P0500.

In the first level below the plowzone (from 24 to 35 cm), the percentage of sherds with shell or sand/shell tempering increased to 45%. Three nondiagnostic lithic artifacts and fragments of bone, including deer, were also collected.

From 35 to 45 cm the density of artifacts decreased, and the percentage of sherds with shell or sand/shell tempering dropped to 21%. Only one lithic artifact, the distal end of a chipped stone adz (FSN 4-8) (Plate 5b), was found in this level.

From 45 to 55 cm no shell tempered sherds were found, and the number of sand tempered sherds decreased, although some large sherds were collected. No lithics were found in this level or below.

From 55 to 65 cm two sherds with a combination of sand and shell tempering were found, and only four sand tempered sherds were recovered. The sediments near the base of this level became finer textured and progressively lighter colored.

Only one sherd was found between 65 and 75 cm. It was a plain, sand tempered sherd. The southwest quarter of Test Unit 1 was excavated in 10 cm levels to 95 cm. No artifacts were found. The sediments became progressively more compact and finer textured, and contained more orange mottles than upper levels (Figure 33). Samples of these sediments were analyzed for texture and grain size and were interpreted as braided stream channel fill.

Significance and Recommendations

Because of poor visibility, no surface collections were made at 3PO500. To reduce crop damage, only one subsurface test, Test Unit 1, was excavated. Test Unit 1 exposed an intact cultural level below the plowzone. This midden contained both Mississippian shell tempered and Woodland sand tempered ceramics. A few nondiagnostic lithic artifacts, including one adz fragment, were recovered. The intact midden renders 3PO500 significant and eligible for nomination to the National Register.

The Mississippian and Woodland components were not clearly separable in Test Unit 1. However, a decrease in the percentage of shell tempered ceramics below 35 cm may indicate that the lower portions of the midden contain a relatively unmixed Woodland component. Agricultural practices have affected the upper part of the midden in Test Unit 1, but other areas of the site may be less disturbed, especially if some portion is buried beneath the spoil from Buffalo Creek Ditch. Additional testing including deep subsurface tests is recommended at 3PO500 in order to determine the boundaries of the subsurface deposits. Once this work has been accomplished then the impact of the proposed project on the site will be known and a mitigation plan can be developed for the site.

Description

3PO501 was recognized by a thin scatter of sand tempered sherds in a bean field. The beans were close-drilled rather than being planted in rows, and visibility was only 20%. The surface distribution was about 30 m in diameter, with the western edge about 60 m east of Buffalo Creek Ditch (Figure 34). This was at the edge of the project corridor with most of the surface distribution outside the corridor.

Two 50 cm x 50 cm controlled columns and one 1 m x 1 m test unit were excavated. Visibility had decreased to less than 10% by the time testing was initiated, and no controlled surface collections were attempted.

Test Unit 1 was the first subsurface test excavated at 3PO501. It demonstrated that an intact cultural level was preserved at the site, but the unit was located outside the project impact zone. Because surface visibility was poor, two 50 x 50 cm controlled columns were excavated west of Test Unit 1 toward Buffalo Creek Ditch to define the western limits of the site and to determine if any part of 3PO501 was within the project impact zone.

Controlled Column 1

Controlled Column 1 was located at the west edge of the surface distribution. This location was 60 m west of Buffalo Creek Ditch, at the east edge of the 200 ft project corridor. The plowzone in Controlled Column 1 was a brown, fine sandy silt loam about 22 cm thick (Figure 35). Below the plowzone was yellow sand. At the top of the yellow sand, separating it from the plowzone, were very thin lenses of white silt. Within the sand was a very thin lens of transported, eroded charcoal. At the base of the yellow sand was a second, thicker lens of eroded charcoal. Below the yellow sand was a dark gray silt loam containing both shell tempered and sand tempered sherds. This zone is an intact cultural midden buried beneath stream fill deposits (yellow sand).

The top of this midden was first encountered at about 35 cm below the surface and dipped to the south. From 40 to 50 cm, six shell tempered and twenty three sand tempered sherds were found (Table 34). From 50 to 60cm, six shell tempered, four sand/shell tempered, and thirty one sand tempered sherds were found. An untyped corner notched projectile point (FSN 21-1) (Plate 1d) (Figure 35) was found at 51 cm below the surface. Two interior flakes and two fire cracked rocks were also found in the midden between 40 and 60 cm deep (Table 35).

Because the midden could not be adequately investigated in a 50 cm x 50 cm unit, Controlled Column 1 was not excavated below 60 cm. A soil core was taken from the base of the excavation in

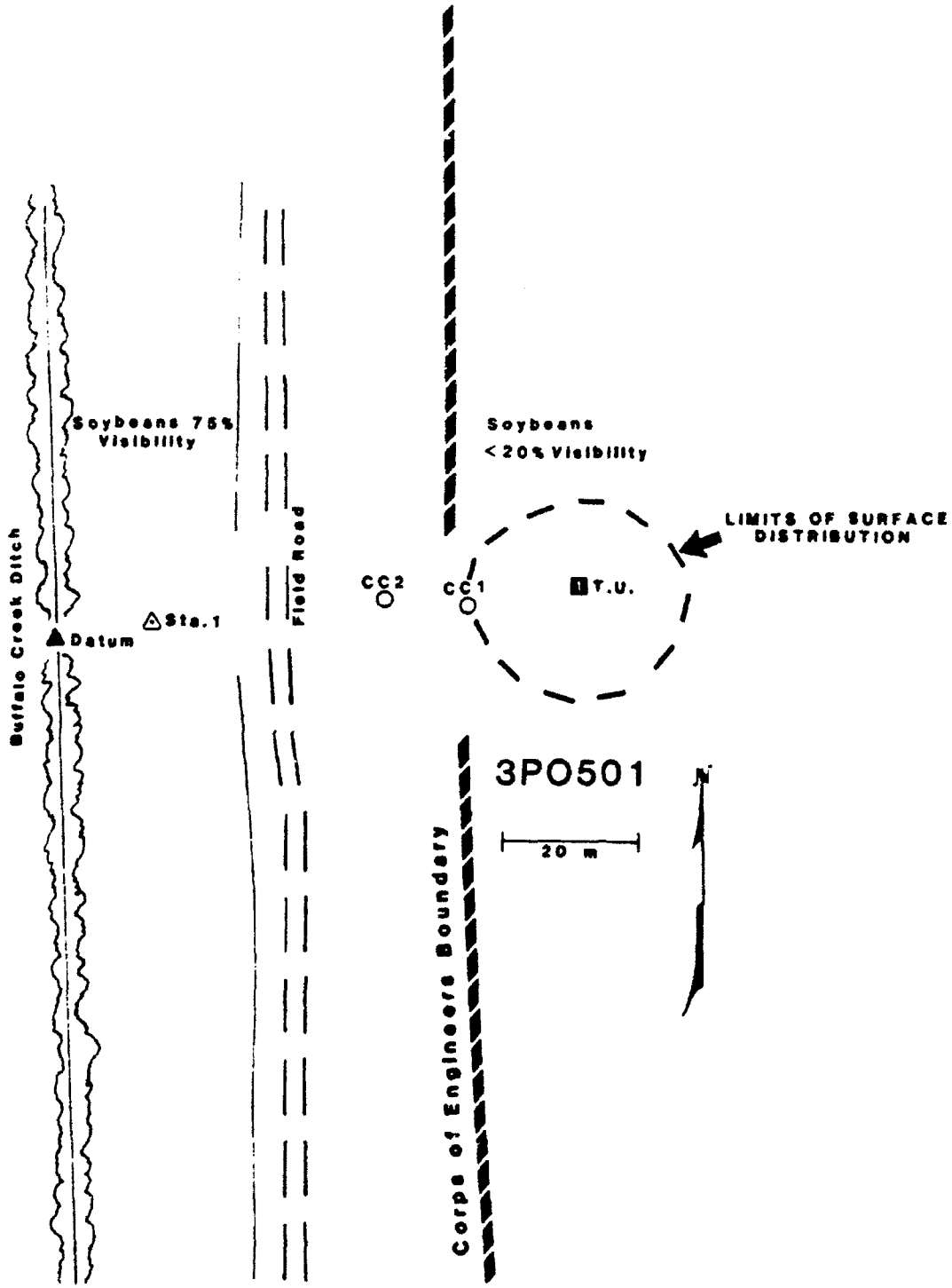


Figure 34. Site Map, 3PO501.

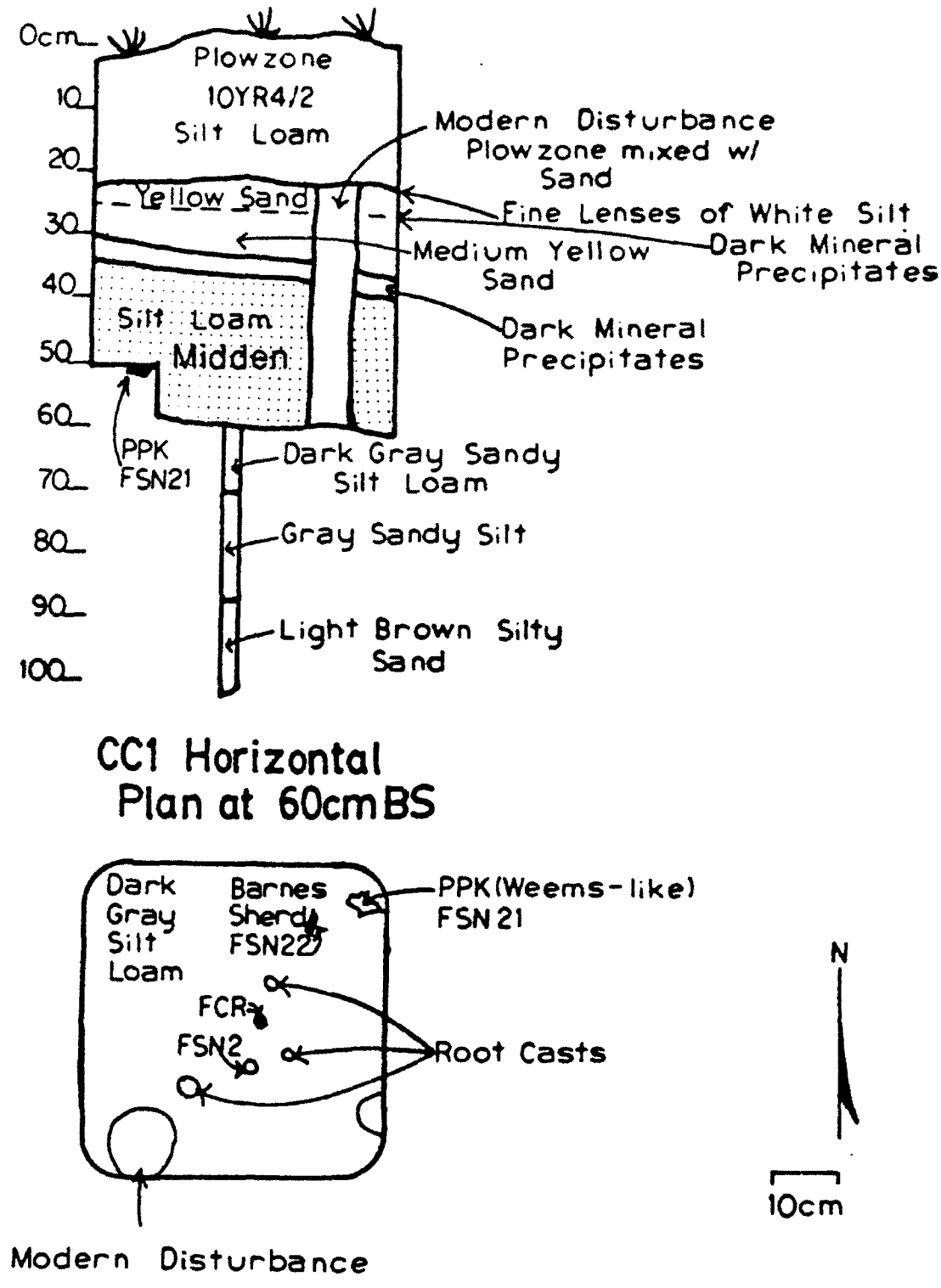


Figure 35. Profile and Floor Plan of Controlled Column 1, 3P0501.

Controlled Column 1 to define the vertical extent of the midden and to identify underlying sediments. This core showed that the dark gray silt loam extended to a depth of 70 cm, although it became sandier below 60 cm. The gray silt loam graded into a sandy silt at 70 cm and then graded into a light brown silty sand at 87 cm. This sandy silt continued to at least 102 cm, which was the base of the soil core. Thus, the sediments below the midden became progressively lighter in color and coarser textured with depth, with no sharp boundaries. Three soil texture samples were collected from Controlled Column 1.

A few vertical columns of sandy sediments intruded the midden and were interpreted as root casts. One of these, originating at the base of the plowzone, was very regular and may have been a modern cultural feature of some kind. It is shown in profile and plan views in (Figure 35).

Controlled Column 2

Because Controlled Column 1 demonstrated that intact cultural levels at 3PO501 were definitely within the project impact zone, a second controlled column was excavated nearer Buffalo Creek Ditch to see how far the buried midden extended in that direction. Controlled Column 2 was located 13 m west of Controlled Column 1 and 47 m east of the ditch (Figure 34).

Below the plowzone in Controlled Column 2 was a yellow sand, similar to the sand below the plowzone in Controlled Column 1. However, the sand in Controlled Column 2 was a thick deposit. It continued to a depth of 80 cm in most of the controlled column and even deeper along the east wall of the excavation. The sand overlay a dark gray clay which sloped gently to the south and abruptly to the east where the sand was deeper. This dark gray clay was somewhat similar to the midden in Controlled Column 1, but apparently contained no artifacts. It was left unexcavated below 80 cm for later examination by the project geomorphologist.

When the geomorphologist visited the site, a soil core was used to sample the clay in Controlled Column 2. A shell tempered sherd was found in the soil core taken from the clay. The clay was then excavated to recover the rest of the sherd and to examine the sediments for other artifacts. The sherd was located at 100 cm below the surface in the dark gray clay. At 90 cm deep in the clay, one interior flake of Crowley's Ridge chert was found. At 150 cm, the gray clay became yellowish; this yellowish clay continued to a depth of at least 180 cm to the base of the soil core.

Table 34. Ceramics Collected at 3PO501.

ABBREVIATIONS USED: Ceramics are listed by temper. PL=Plain; CDM=Cordmarked; FC=Fired Clay; P=Ceramic Particles.

FSN	LOCATION	SHELL	SAND/SHELL	SAND		FC	P	
		PL		PL	CDM			TOTAL
1	Near TU1			7		1		8
2	TU1 0-10		4	21	4	2	X	31
3	TU1 10-20	7		13	4	1	X	25
4	TU1 20-30	10	2	29	6	10	X	57
6	TU1 30-35-1	1		1				2
7	TU1 30-35-2			1				1
9	TU1 35-40-1		1			4		5
10	TU1 30-40		2	24	6	5	X	37
11	TU1 35-40		1	2		1		4
12	TU1 40-50(1-3)			1		1		2
14	TU1 40-50	3		6	3	5	X	17
15	TU1 50-60(1-3)		1	2				3
16	TU1 50-60			2		1		3
17	TU1 60-70			2				2
19	CC1 PZ				1	1		2
20	CC1 40-50	6		14	9	14		43
18	CC1 50-60	6	4	15	16	5	X	46
22	CC1 60 cm				1			1
23	CC2 100 cm		1					1
	TOTAL	33	16	140	50	51		290

Table 35. Lithics Collected at 3PO501.

ABBREVIATIONS USED: PP=Projectile Point; UF=Utilized Flake; B=Biface; SFLK=Secondary Flake; IFLK=Interior Flake; FCR=Fire Cracked Rock.

FSN	LOCATION	PP	UF	B	SFLK	IFLK	FCR	TOTAL
1	Near TU1					1		1
3	TU1 10-20		2			2	1	5
4	TU1 20-30					1	2	3
10	TU1 30-40			1	1	2	2	6
14	TU1 40-50		1		1			2
18	CC1 50-60					2	1	3
21	CC1 51 cm	1						1
22	CC1 60 cm						1	1
23	CC2 90 cm					1		1
TOTAL		1	3	1	2	9	7	23

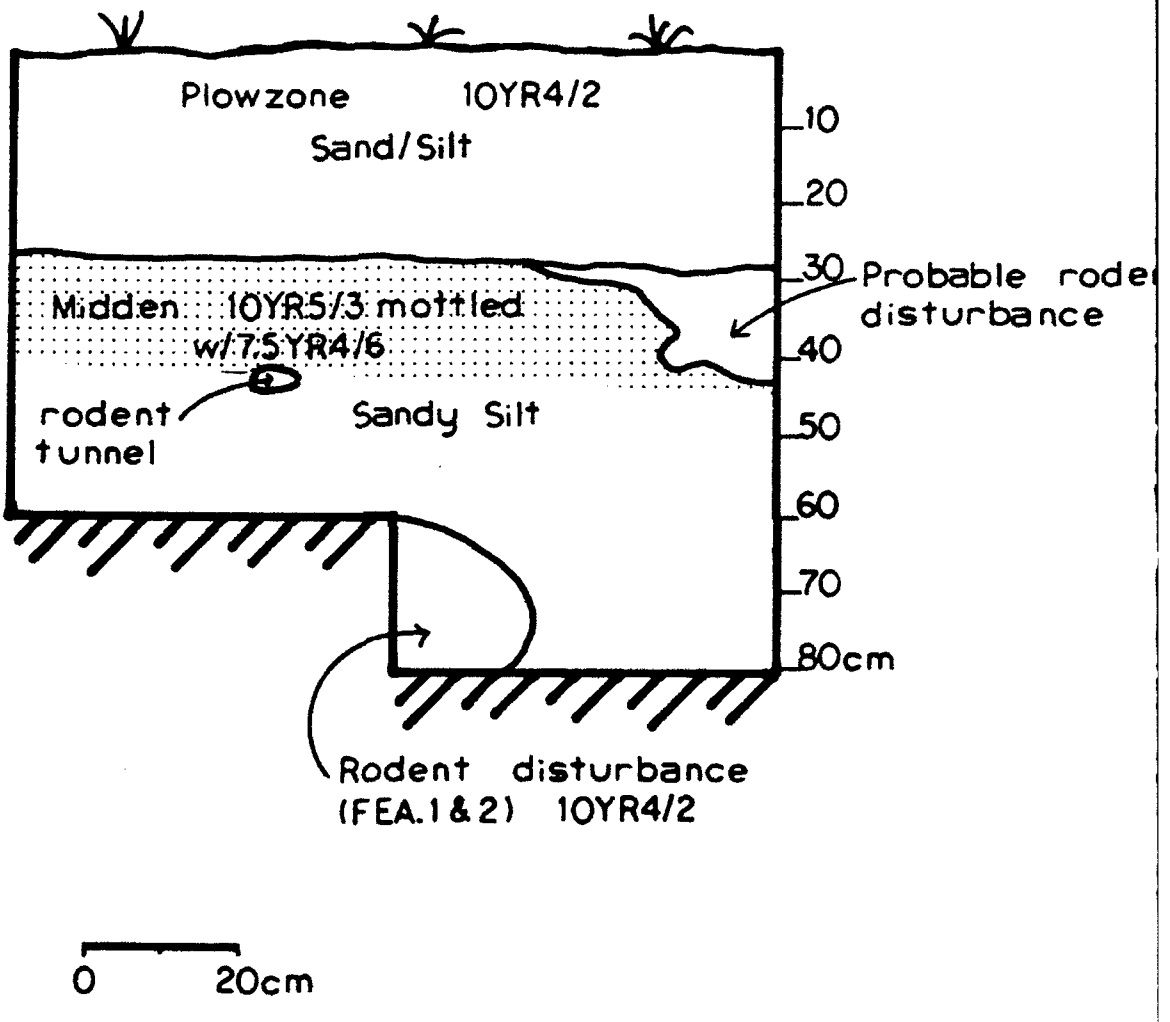


Figure 36. Profile of Test Unit 1, 3P0501.

This clay has been interpreted as a braided channel fill deposit, and the artifacts found in Controlled Column 2 were very likely deposited in an abandoned stream channel at the western edge of 3PO501. This channel has now been completely filled by more recent sediments which have also buried at least the western portion of the cultural midden at the site.

Test Unit 1

Test Unit 1 was located about two meters northeast of the center of the surface distribution. All artifacts on the surface within two meters of the test unit were collected (Tables 34 and 35). These seven sherds are the only artifacts collected from the surface of 3PO501.

The plowzone in Test Unit 1 was a brown, fine sandy silt loam up to 28 cm deep (Figure 36). It contained both shell tempered and sand tempered sherds (Table 34), all of which were small, and a few lithic artifacts (Table 35). Chisel plow scars were visible at the base of the plowzone, contrasting sharply with the mottled sediments below the plowzone. Three small, distinct disturbances were visible at the base of the plowzone in the southeast corner of Test Unit 1. These proved to be rodent burrows and continued throughout the unit to the base of the excavation (Figure 36).

Sediments immediately below the plowzone contained larger and more numerous sherds than the plowzone (Table 35). The stratum from the base of the plowzone to 40 cm below the surface is probably the intact remnant of a cultural midden, although the artifact density in Test Unit 1 was not as high as in Controlled Column 1. A few sherds found below 40 cm are attributed to various post-depositional disturbances, including rodent activity.

Test Unit 1 was excavated to 60 cm, and the southwest quarter of the unit was excavated to 80 cm. Only two sherds were found from 60 to 70 cm, and no artifacts were found below 70 cm. The soil samples evaluated for texture and grain size indicates that the sediments are braided stream channel fills.

Significance and Recommendations

Although the surface distribution of artifacts at 3PO501 was thin and entirely outside the project corridor, test excavations indicated that an intact, buried, cultural midden preserved west of the surface distribution is within the impact zone. Remnants of this midden also exist below the plowzone outside the impact zone, but have been disturbed by plowing, at least in the upper levels. The boundaries of the buried deposits have not been determined, and other intact features are probably present.

At least two components are represented by the artifacts collected at 3PO501. The shell tempered sherds and sherds with a combination of sand and shell tempering represent a Mississippian

period component. Based on the lack of decorated ceramics and on the combination of sand and shell tempering, this is probably an Early to Middle Mississippian component.

The sand tempered ceramics, some of which are cordmarked, represent a Late Woodland period component. Some of these sand tempered ceramics could be older, but there is no firm evidence to support this conjecture. A single projectile point found in association with these sand tempered sherds is similar to a type (Weems) usually dated to the Late Archaic through Early Woodland periods. This projectile point may also be a Late Woodland variant of the Weems type.

The intact cultural deposits contain information important to our understanding of the prehistory of the area. Site 3PO501 is significant and eligible for nomination to the National Register. Additional testing to determine site boundaries is recommended at this site. Based on the results of this work the impact of the proposed project can be estimated and a mitigation plan, if necessary, can be devised.

3PO502

Description

This site was discovered in a cotton field west of Buffalo Creek Ditch. Visibility was about 70% in the cotton field and almost 100% in a disked strip between the field and the ditch. A state highway separates the field from the disked strip and the ditch. The surface distribution of artifacts was determined to be about 90 m x 45 m and ended on the eastern edge at the highway. The 200 ft corridor specified in the scope-of-work extends about 10 m into the eastern edge of the site. A high density of artifacts was observed in an area about 20 m in diameter near the center of the surface distribution.

Repeated efforts to contact the landowner, who was in ill health, for permission to test the site were unsuccessful. This constraint was discussed with the Contracting Officer's Representative who determined that ditch cleanout operations would not affect the highway and therefore would not affect a site on the opposite side of the highway from the ditch. The surface distribution was checked to be sure the site did not extend across the highway, and no artifacts were observed between the highway and Buffalo Creek Ditch.

Because the landowner could not be contacted, no artifacts were collected. Those observed on the surface included both shell tempered and sand tempered ceramics and a few lithic artifacts, including a hammerstone of Crowley's Ridge chert. These artifacts indicate that a Late Woodland and a Mississippian component are present at the site. The high density of artifacts near the center of the surface distribution may also represent an intact midden. This site is recommended for testing.

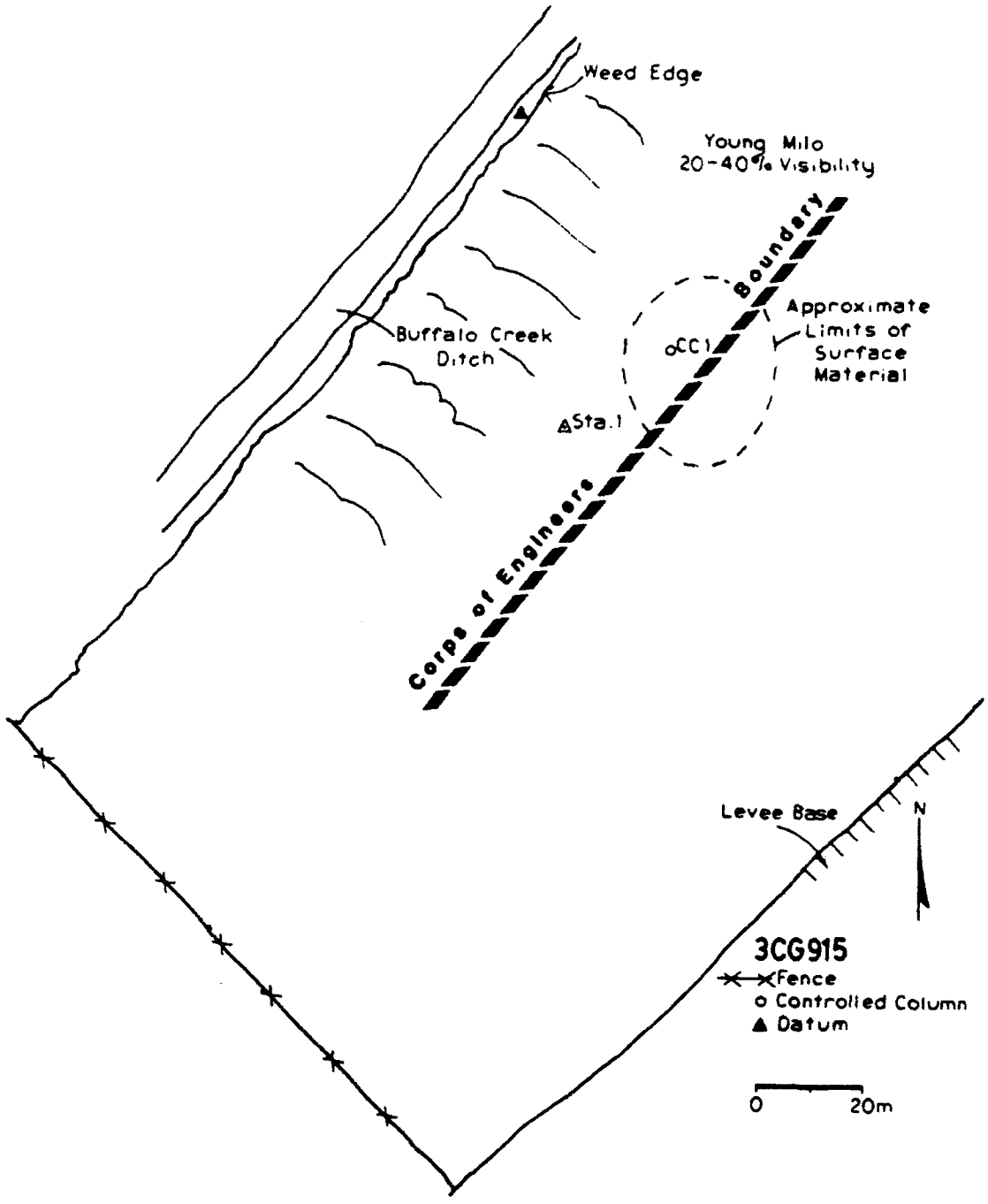


Figure 37. Site Map, 3CG915.

3CG915

Description

When 3CG915 was first discovered, it consisted of a small low rise containing a low density of Barnes sherds. The area was mapped as 15 m x 20 m and the site was located on the southeast side of Buffalo Creek Ditch (Figure 37). The visibility was poor since the field was planted in milo and bermuda grass grew between the rows. Much effort was taken to find the land manager to obtain permission for subsurface testing, but a spokesperson for the land bank could not be found.

A return visit to the site was made in the winter and the site was examined. The milo had not been harvested but because the vegetation had died, surface visibility was improved to about 60%. All artifacts, which consisted of about 10-20 Barnes sherds, were flagged and the distribution was mapped as about 40 m N-S x 30 m E-W. Permission to test had not been obtained, so only one controlled column was excavated at the site.

Controlled Column 1

Controlled Column 1 was positioned in the center of the site. The profile of this unit is shown in Figure 38. The plowzone from 0-20 cm contained one piece of clear pressed glass. Below the plowzone was a 20 cm intact Barnes or Late Woodland midden. Two plain and one cordmarked sand tempered sherds were collected from the midden in addition to seven pieces of fired clay. The sediments resemble other Barnes middens found during this study. The soil was compact and mottled, and the sherds were large. Below the midden was a sediment which did not contain cultural material.

Significance and Recommendations

On the ditch west of the site is an area where the spoil has been removed. It is possible that the artifacts on the surface of this site have been smeared over the field from this cut, especially since the plowzone was devoid of prehistoric material. 3CG915 is recommended for further testing in order to find the extent of the single component buried Barnes site and to collect additional information on its context. Based on these limited excavations, the site is significant and eligible to the National Register. Deep subsurface testing is necessary in order to determine if the site continues under the spoil. If it does, it is likely to be adversely affected by the proposed project and any disturbance must be mitigated.

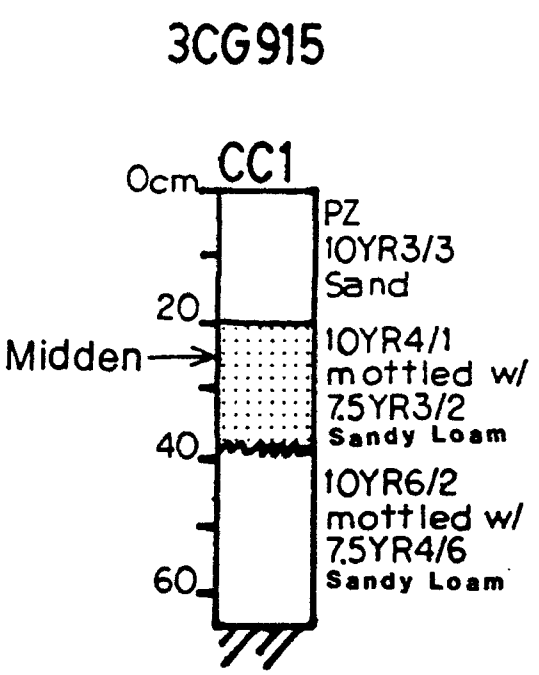


Figure 38. Profile of Controlled Column 1, 3CG915.

BURIED SITES

Introduction

When a cluster of artifacts was observed solely on the spoil of the ditch and was not observed in the field, the site was considered buried. It was believed that previous ditch construction and/or cleaning had cut the site and redeposited the material on the spoil. Many of the locations of the buried sites are at the contact of the braided terrace surface with old meander channel fills. These relationships have been adequately documented by bank profiles conducted during testing phases at other sites in northeastern Arkansas (Lafferty et al. 1984, 1985, 1987). It has also been shown that the success rate of finding the intact site is directly correlated with the amount of cultural material on the surface. The bank profiles and deep subsurface tests which would be required to locate the intact deposits were beyond the scope of this contract. However, several quick profiles of the ditch bank were made at two sites and, in one of these, buried cultural material was found about one meter below the spoil and below the existing field.

Significance and Recommendations

Each one of these locations has a good potential for containing intact deposits which are significant for nomination to the National Register. For this reason, deep subsurface tests conducted with a backhoe and/or bank profiles are recommended and should result in the identification of buried sites. All of the buried sites described in this section need further examination to determine site boundaries, nature of the deposits, and their significance. After additional testing these sites can then be evaluated in relation to the impact of the proposed ditch cleaning.

3MS479

Description

3MS479 was first recognized by the presence of a sand tempered sherd on a spoil bank of Buffalo Creek Ditch. Four other sherds, including one small shell tempered sherd, were found near the first, but no other artifacts were observed. A bean field at the foot of the spoil bank was closely examined but no cultural material was found, although visibility was excellent. The spoil bank on the opposite side of Buffalo Creek Ditch was also examined. Surface visibility was poor in the dense vegetation on the spoil and no additional artifacts were found.

Twenty-nine sherds (Table 36, FSN 2) were collected from the spoil bank when the site was revisited in late August. Shell tempered sherds (some with shell and sand) represent a Mississippian component, and sand tempered sherds (some cordmarked) represent a Woodland component. No lithic artifacts were observed.

Table 36. Ceramics Collected at 3MS479.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; CDM=Cordmarked.

FSN	LOCATION	SHELL	SAND/SHELL	SAND		TOTAL
		PL		PL	CDM	
1	Surface	1			5	6
2	Surface	9	5	12	3	29
	TOTAL	10	5	12	8	35

The distribution of artifacts on the spoil bank was found to extend more than 225 meters along Buffalo Creek Ditch and indicates that a large site has been intersected by previous excavation of Buffalo Creek Ditch.. The original ground surface in the bean field was re-examined several times, but artifacts were confined to the spoil. Since the site was not observed in a field paralleling the spoil bank, the site may be buried, not only beneath the spoil, but also beneath recent alluvium. Heavy vegetation along Buffalo Creek Ditch prevented an examination of the ditch bank profiles. The original depth and horizontal extent of the portion of the site previously affected by ditch construction could not be determined.

3MS480

Description

When 3MS480 was discovered, one Barnes Cordmarked body sherd and one projectile point fragment (FSN 2-1) were found on the surface of a spoil bank along Ditch 7 (Plate 1b). The spoil bank and the original ground surface were planted in soybeans. Artifacts were observed only on the spoil bank on the south side of Ditch 7, and none were observed on the spoil bank north of the ditch (where visibility was poor in dense vegetation) or on the original ground surface.

Table 37. Ceramics Collected at 3MS480.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; CDM=Cordmarked; FC=Fire Cracked.

FSN	LOCATION	SHELL			SAND/SHELL	SAND		FC	TOTAL
		PL	O	VR		PL	CDM		
1	Surface						1		1
3	Surface					9	16	1	26
	TOTAL					9	17	1	27

Table 38. Lithics Collected at 3MS480.

ABBREVIATIONS USED: PP=Projectile Point; SFLK=Secondary Decortication Flake; UNMOD=Unmodified Stone.

FSN	LOCATION	PP	SFLK	UNMOD	TOTAL
2	Surface	1			1
3	Surface		2	1	3
	TOTAL	1	2	1	4

When the site was revisited one month later, 26 additional Barnes sherds were found (Table 37). The distribution extended about 50 meters east to west along the spoil bank, and still no artifacts were observed on the original ground surface. The bank of the ditch was heavily vegetated and could not be examined. Because the artifacts were restricted to the spoil bank, the site is considered to be a buried site of unknown extent.

Besides the sherds, two flakes of Crowley's Ridge chert with cortex and one unmodified angular fragment of orthoquartzite were found. The projectile point fragment found during the first visit is the basal portion of an untyped straight stemmed point with a straight base (Table 38). It resembles the Burkett type (Chapman 1980:306; Morse and Morse 1983:116-118), but is more strongly shouldered with one shoulder barbed and one slightly barbed. The assemblage apparently represents a single component Woodland occupation of the site.

Description

At 3MS481 nine sand-tempered Barnes sherds and one small adz were collected on the ditch spoil and edge of the field in an area 50 m E-W x 30 m N-S on the north side of Ditch 13 (Figure 39). All artifacts, except two sherds were clustered on the spoil in an area 10 m N-S x 15 m E-W adjacent to the ditch. Visibility in the cotton rows was about 50% and was 75% on the spoil. Six bank profiles were excavated at approximately 10 m intervals along the edge of the bank. One Barnes sherd was found one meter below the surface in an organic rich soil. The site is located on the contact between Dundee Silt Loam and the Routon-Dundee-Crevasse complex.

Surface Material

All the sherds collected were coarse sand tempered body sherds and are believed to be plain, although surfaces were highly eroded. One sherd was large and it fragmented into six pieces. Only one lithic artifact, a thick biface (FSN 7-1), was found at the site. It was composed of Crowley's Ridge chert and was probably used as an adz, but had broken during resharpening. It is similar to adzes found in Woodland contexts. All artifacts collected on the surface of the site are listed in Table 39.

Table 39. Artifacts Collected on the Surface of 3MS481.

FSN	SAND-TEMPERED PLAIN SHERDS	UNSORTED SHERD PARTICLES	SMALL ADZ	TOTAL
1	1	x		1
2	2			2
4	1			1
5	1			1
6	1			1
8	1			1
7			1	1
10	1			1
11	1			1
TOTAL	9		1	10

Bank Profiles

Six bank profiles labeled A-F (from east to west) were excavated at 10 m intervals. Each was at least one meter wide and 1-2 m in depth. Profile A was positioned west of the surface material. It contained spoil followed by a thin humus zone.

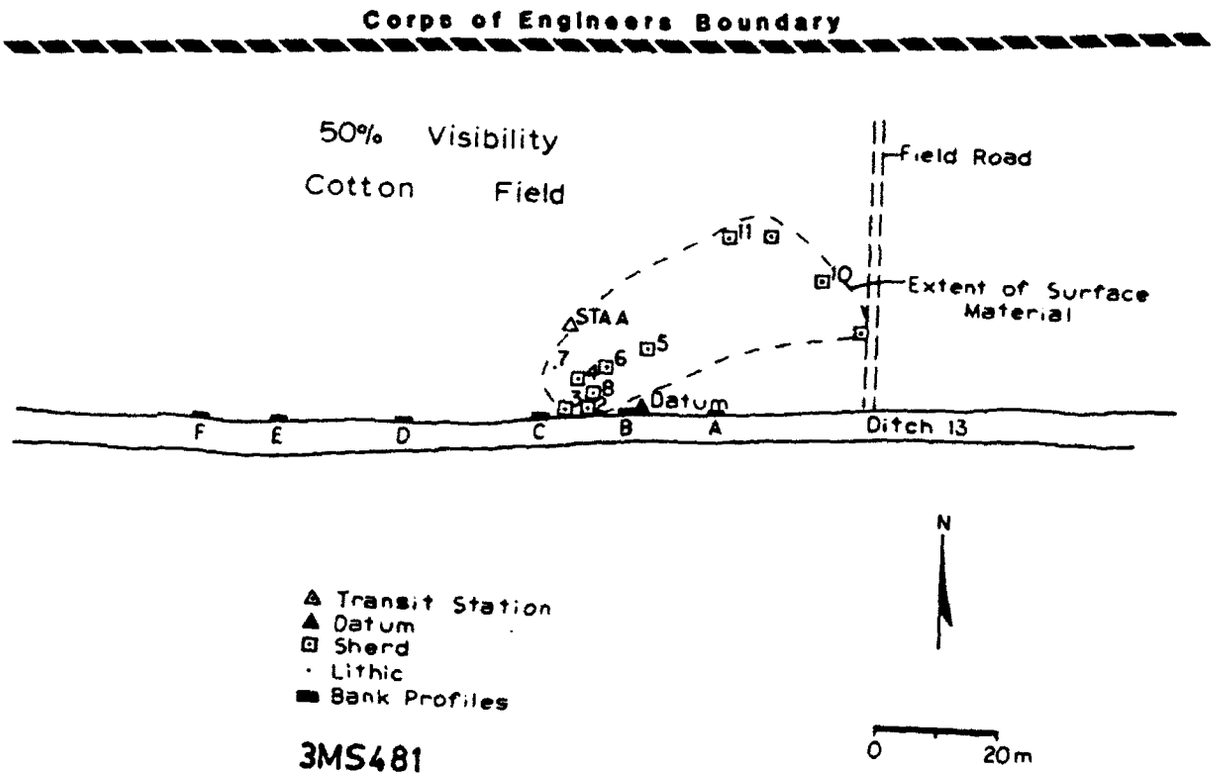


Figure 39. Site Map, 3MS481.

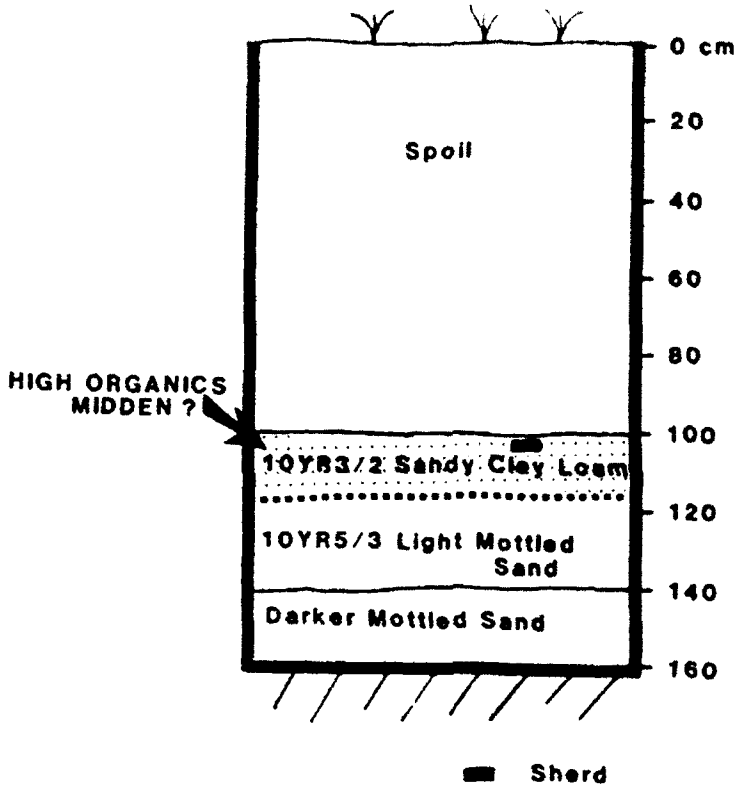


Figure 40. Bank Profile D, 3MS481.

Below the humus was a gray and red mottled soil with manganese staining. This profile was similar to Profile D (Figure 40). Profile B contained the spoil followed by an old humus. Below it was a brown and tan mottled soil. Profile C had the same profile as Profile D, but lacked the cultural material. In Profile D the same sediments were observed but one highly eroded sherd was found one meter below the top of the berm in the gray sandy clay loam (10YR3/2). In this exposure the sediment is about 20 cm thick. The elevation was mapped with a transit and this depth was below the present day field. Profile E contained only spoil, possibly an indication of soil creep. Profile F contained spoil followed by the gray sandy clay loam which may represent the cultural level, but no artifacts were observed.

During this project several intact Barnes middens were documented and all have sediments similar in color, texture, and thickness to that documented in this profile. This data combined with the geomorphic interpretations of this area further support that buried deposits exist within the project corridor. They should be further investigated in order to determine more about the nature and context of the deposits, and finally whether the proposed project will have an adverse impact on these cultural resources.

3MS482

Description

At 3MS482 (Figure 41) a small tight cluster of Woodland ceramics and a side notched projectile point were found on the Ditch 13 spoil. The surface distribution of the artifacts measures 45 m x 20 m. This site is probably buried under the present day field and part of it has been cut by previous ditch cleaning. Deep subsurface testing is recommended in order to define the site boundaries and to collect information on the nature of the deposits. 3MS482 is positioned east of a meander channel fill where sediments were extracted from Backhoe Trench 1 in the geomorphic study.

Surface Material

When the site was initially discovered a cluster of about 30 Barnes sherds and two lithics were observed from a 10 m diameter area on the spoil (Figure 41). Half of the spoil had been tilled and rained on affording 100% surface visibility and half of the site had been planted in cotton in which surface visibility was about 60%. No cultural material was observed in the field below the spoil.

On a return visit to the site, a few additional sherds were observed outside the first cluster of artifacts, but all of these were confined to the spoil. Artifacts collected are listed in Table 40. The side notched projectile point (FSN 1) (Plate 2b) is the base and midsection of an untyped projectile point which may indicate the site has an Archaic component.

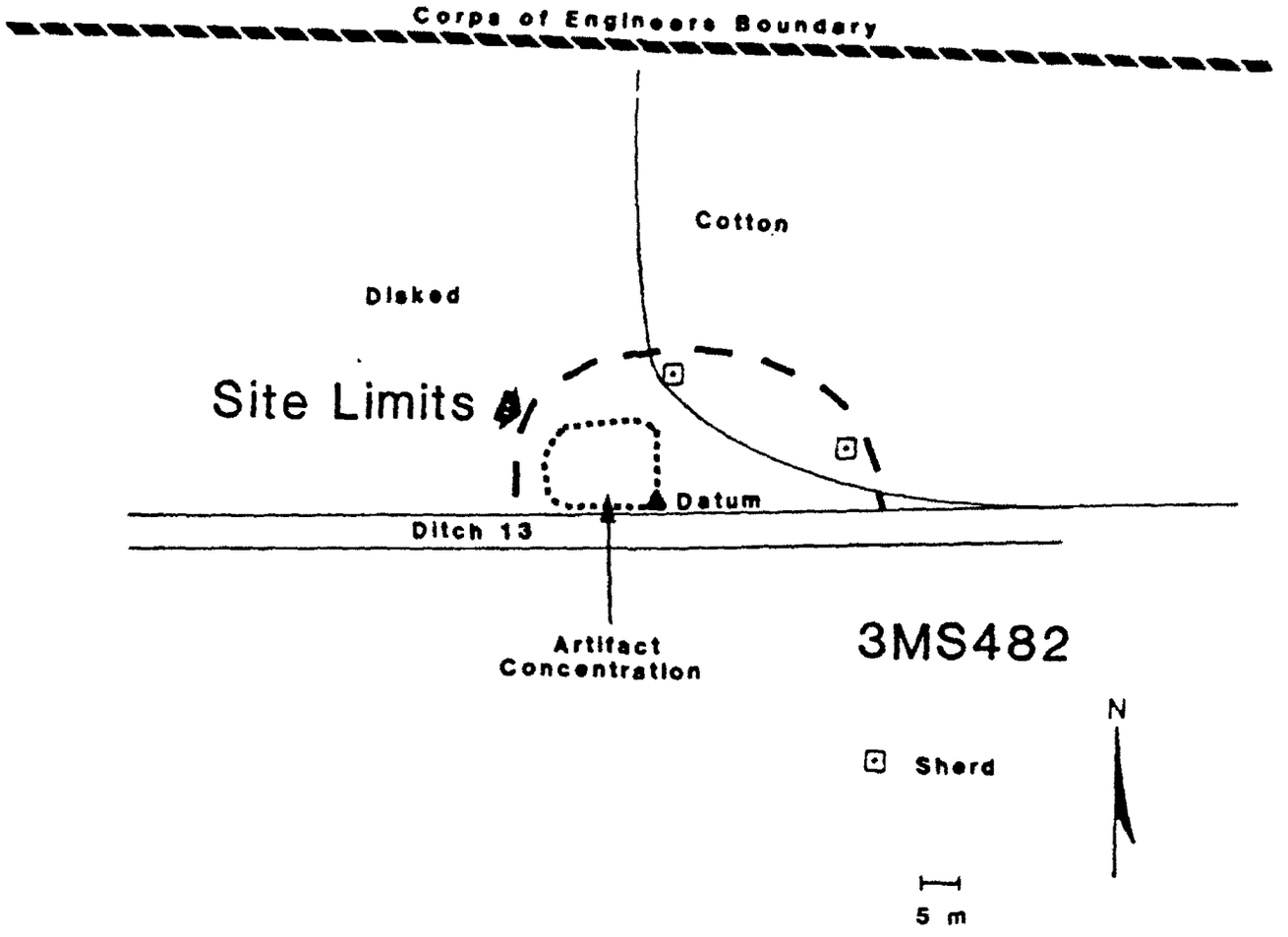


Figure 41. Site Map, 3MS482

Table 40. Artifacts Collected on the Surface of 3MS482. ABBREVIATIONS USED: CORDM=Cordmarked; PP/K=Projectile Point/Knife; FCR=Fire Cracked Rock.

FSN	SAND-TEMPERED PLAIN	SAND-TEMPERED CORDM	UNSORTED SHERD PARTICLES	PP/K	FCR	TOTAL
1	1	2		1	1	5
2	8	6			1	15
TOTAL	9	8		1	2	20

3MS483

Description

Two visits were made to 3MS483. On the initial visit a small cluster of Barnes sherds was observed on the ditch spoil. The majority of the cultural material was found on the south side of the ditch; however, one sand tempered sherd was observed and collected on the north side of Ditch 7. On a return visit the limits of the distribution were mapped with a transit and all artifacts observed were collected (Table 41). The field and spoil were planted in soybeans, but surface visibility in the rows was about 75%.

The site is characterized by a cluster of Barnes sherds measuring 40 m in diameter and confined only to the spoil of Ditch 7 (Figure 42). One projectile point midsection (FSN 4-6) composed of Crowley's Ridge chert was collected at the site. It is a narrow blade and has slight use polish on the extreme distal portion of one blade edge.

3MS483 is the location of a Barnes or Late Woodland period site. It lies buried beneath the field and has been cut by the ditch.

Table 41. Artifacts Collected on the Surface of 3MS483. ABBREVIATIONS USED: PP/K=Projectile Point/Knife.

FSN	SAND-TEMPERED SHERDS PLAIN	SAND-TEMPERED SHERDS CORDMARKED	FIRED CLAY	PP/K	TOTAL
1	1				1
2		1			1
3		1			1
4	36	13	1	1	51
5	1				1
TOTAL	38	15	1	1	55

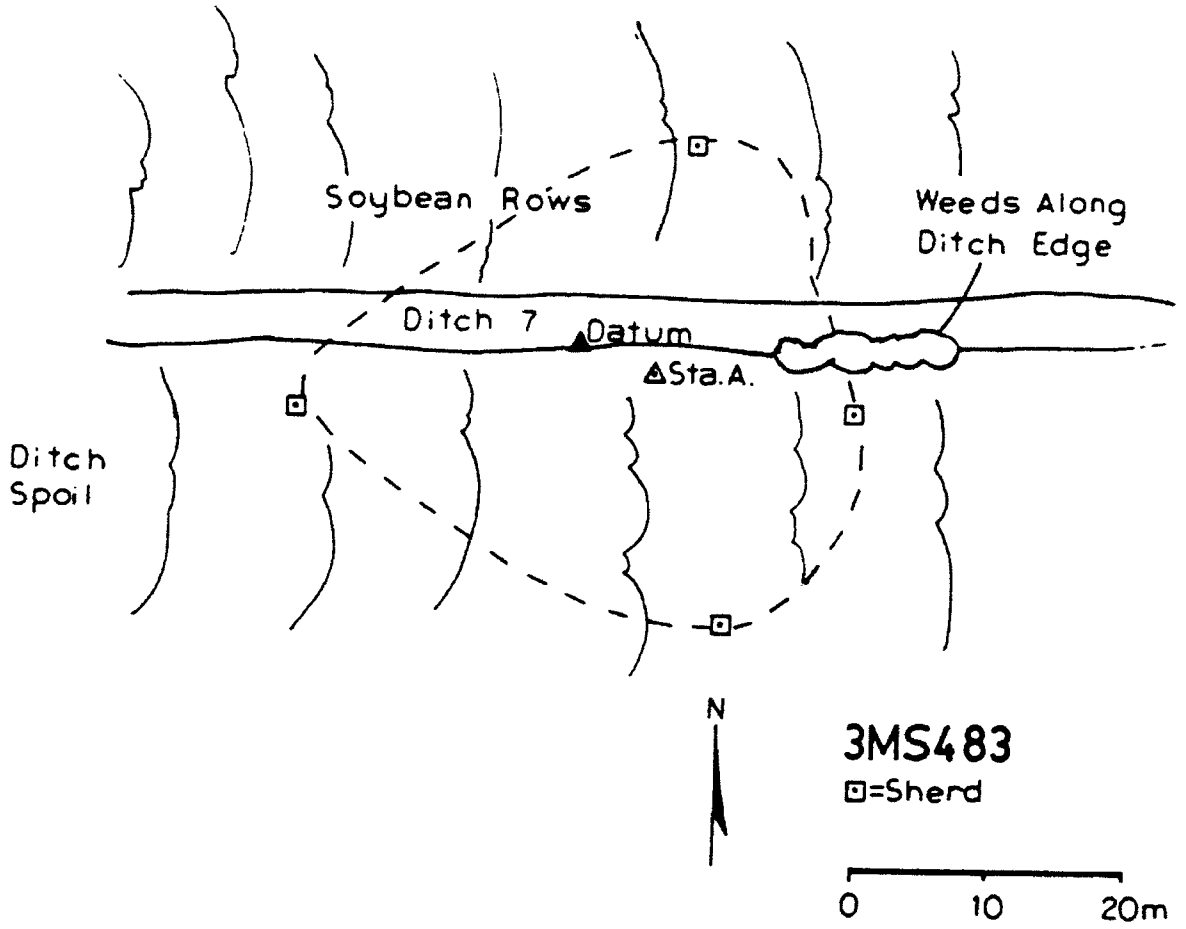


Figure 42. Site Map, 3MS483.

Description

This site was identified by six small flakes of Crowley's Ridge chert found on a low spoil pile along a shallow field ditch. This spoil and the flakes were 58 m west of Buffalo Creek Ditch, at the extreme western edge of the 200 ft project impact zone.

The flakes were found in a light colored soil exposed on the low spoil. An even lighter colored soil was exposed south of the flakes and a darker soil north of them. The northernmost and southernmost flakes were only 16 m apart. One other flake was observed about 5 m west of the spoil in a milo field.

During a subsequent visit to the site, the six flakes on the spoil were collected, and one 1 m x 1 m test unit and one 30 cm x 50 cm shovel test were excavated. Except for a few small, unmodified pebbles in the plowzone of the test unit, no artifacts were found. The sediments in the excavations were a mottled, clayey sand throughout, with the clay content increasing with depth (Figure 43).

Three of the six flakes were interior flakes, two were flakes of secondary decortication, and one was a flake of primary decortication (Table 42). None exhibited any retouch or evidence of use. Since no diagnostic artifacts were found, the site cannot be assigned to a particular cultural period. The lack of ceramics suggests either a special activity site or a site which predates the ceramic periods. The very low density of artifacts prevented the definition of site boundaries, although visibility was 100% within the 200 ft impact zone and about 40% in the milo field outside the corridor. Because artifacts were found on the spoil and only one flake was observed on the surface of the field, the site is presumed to be buried.

Table 42. Lithics Collected at 3MS484.

ABBREVIATIONS USED: PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake.

FSN	LOCATION	PFLK	SFLK	IFLK	TOTAL
3	Surface	1	2	3	6

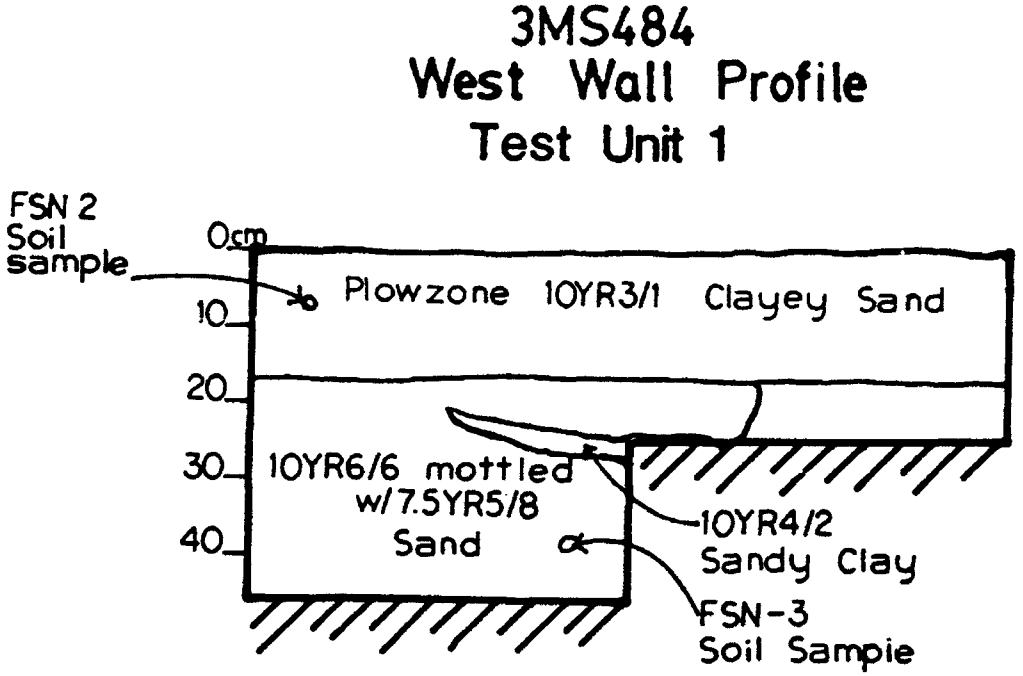


Figure 43. Profile of Test Unit 1, 3MS484.

Description

This site was identified by a thin scatter of sand tempered sherds on spoil from Buffalo Creek Ditch (Figure 44). Although there was a noticeably greater density in an area about 20 m in diameter, a few sherds were scattered over a distance of about 60 m along the ditch spoil. Visibility was 100% on the spoil and in an adjacent field, and no artifacts were found on the original ground surface. Limits of the sherd scatter were mapped with a transit and all artifacts on the spoil were collected as one provenience.

Test Unit 1

One 1 m x 1 m test unit was begun at the contact of the ditch spoil with the original ground surface at the edge of the cultivated field. This unit was excavated to determine if a few artifacts observed along a small field ditch were derived from that small ditch or from Buffalo Creek Ditch. The unit was located at the edge of the small field ditch where a flake and a small sherd were observed on the surface.

Spoil from Buffalo Creek Ditch extended to a depth of 16 cm. This spoil was removed as one excavation unit, and 3/4 of the excavated fill was screened. One small, eroded sand tempered sherd and two small fragments of clear glass were found in the spoil. At the base of the spoil, thin streaks of sand intruded the underlying fine sandy loam to a depth of 1 to 3 cm. These streaks were regularly spaced, 3 cm wide and 30 cm apart. They are probably the tracks of the heavy equipment used during an earlier cleanout of Buffalo Creek Ditch.

The second level in Test Unit 1, from 16 to 26 cm below the surface, appeared to be an old plowzone. The west half and a portion of the east half of this level were screened, and no artifacts were recovered. This plowzone was 10 cm thick, and the base of the excavation level coincided with an abrupt change to a dark gray clay with ferro-manganate concretions. No plow scars were visible. One piece of vitrified material of probably recent origin was found at 25 cm below the surface in the south wall of the unit.

Because this excavation demonstrated that all of the artifacts observed on the surface had been derived from the spoil and not from some shallowly buried context at the edge of the field, excavation of the Test Unit 1 was discontinued at 26 cm below the surface. All of the artifacts observed have been dredged from some undetermined depth and location in Buffalo Creek Ditch.

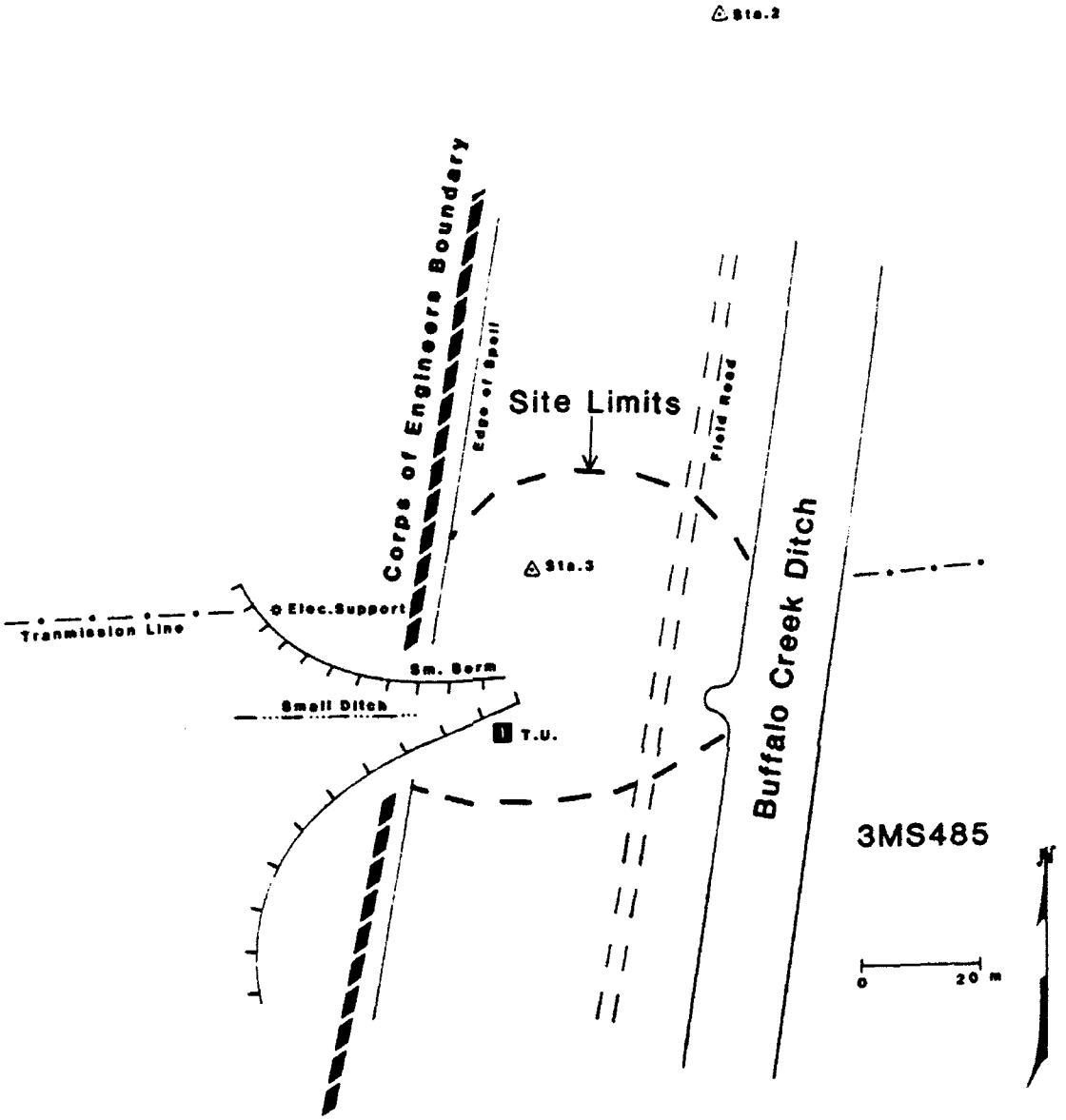


Figure 44. Site Map, 3MS485.

Summary

One sherd was found on the surface of Test Unit 1 and one in the spoil in the test unit. Thirty six sherds were found on the general surface of the spoil. All of the sherds are sand tempered and all have eroded surfaces, although 10 sherds could be identified as cordmarked (Table 43).

Table 43. Ceramics Collected at 3MS485.

FSN	LOCATION	SAND		TOTAL
		Plain	Cordmarked	
3	Surface	1		1
4	Surface	26	10	36
5	TU1 0-16	1		1
	TOTAL	28	10	38

Table 44. Lithics Collected at 3MS485.

ABBREVIATIONS USED: PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake.

FSN	LOCATION	PFLK	SFLK	TOTAL
1	Surface	1		1
2	Surface	1		1
4	TU1 Surf		1	1
	TOTAL	2	1	3

Three lithic flakes were found on the surface of the spoil (Table 44). A biface thinning flake and a flake of secondary decortication are Crowley's Ridge chert. A preform thinning flake with recent edge damage was identified as "other" chert. In addition, the distal tip of a projectile point was found on the spoil about 90 m south of the sherd scatter. This fragment was not typeable and was not collected.

These artifacts indicate that a buried Late Woodland site of undetermined size has been intersected by Buffalo Creek Ditch. Locating such sites precisely can only be accomplished using mechanical equipment, and such procedures were outside the Scope-of-Work of the current project.

3MS486

Description

3MS486 consisted of three artifacts scattered over 35 m of spoil and within 8 m of the ditch bank. The artifacts observed, but not collected, consisted of a Crowley's Ridge chert core, one Barnes Cordmarked sherd, and one plain grog tempered sherd. The entire area had been disked and rained on so that surface visibility was excellent (100%).

One bank profile was excavated adjacent to the three artifacts but no cultural material or levels were observed in this location. The sediments are briefly described in Figure 45. This site dates to the Late Woodland period and it has been truncated by ditch construction. Deep subsurface testing is required in order to find and collect information on the nature of the deposits.

3PO496

Description

3PO496 is a scattering of Barnes sherds and lithic artifacts which extends over an area measuring 95 m N-S and 25 m wide (Figure 46). All the material was confined to the spoil from Buffalo Creek Ditch. There is a good possibility that 3PO496 and 3PO497 may be the same site which has been bisected by the ditch.

A moderate scattering of Barnes sherds and lithic debitage was observed on the surface of the site which was planted in soybeans. At the time of site discovery surface visibility was good, about 75-80%. One sandstone edge ground cobble (FSN 1-1) was collected at that time. However, on a return visit to map and collect the site, the soybeans which had been broadcast obscured the surface such that collections were not possible.

Site 3PO496 is probably the location of a Barnes or Late Woodland house or village. If it is related to 3PO497, there may also be an Early Mississippian occupation. Extensive prehistoric occupation has occurred in this vicinity of Buffalo Creek Ditch and deep subsurface testing is necessary in order to locate the intact deposits.

3PO497

Description

At 3PO497 almost 200 artifacts were observed and collected from the surface of the spoil on the west side of Buffalo Creek Ditch (Figure 47). The distribution measuring 75 m N-S 25 m was mapped with a transit and a complete collection made (Table 45) The area had been tilled and rained on affording 100% visibility.

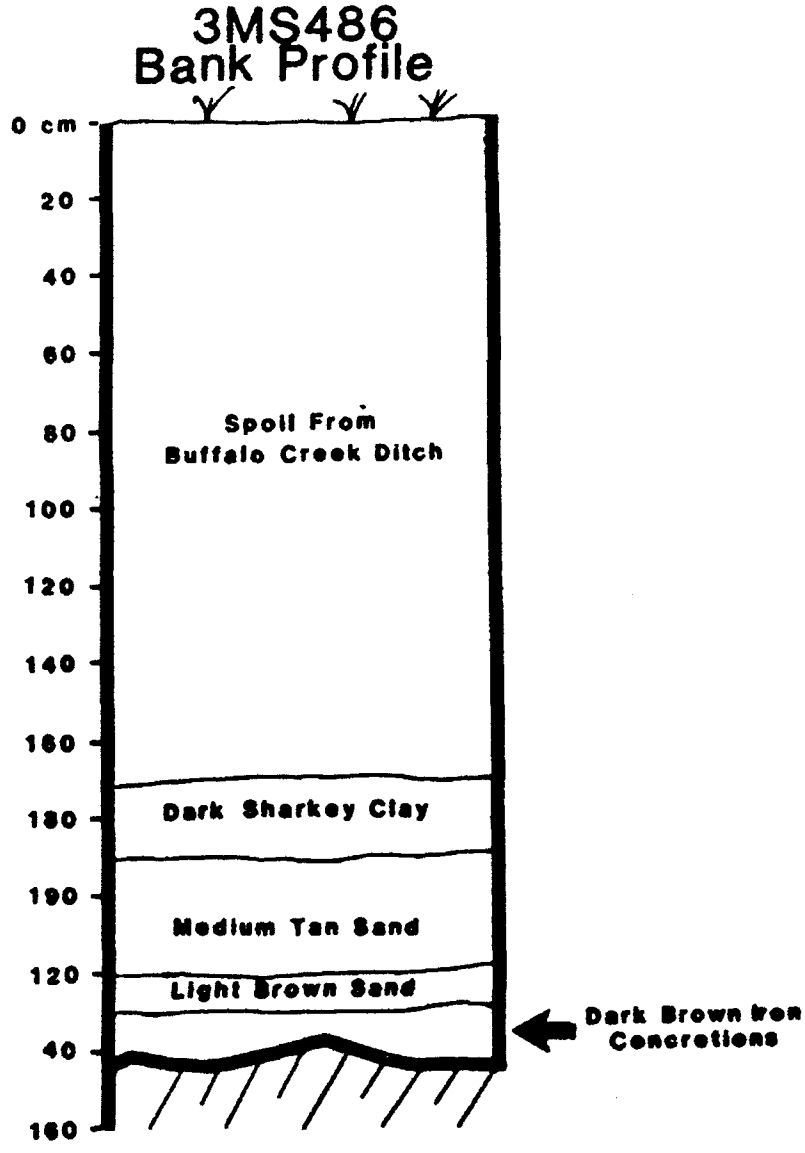


Figure 45. Bank Profile, 3MS486.

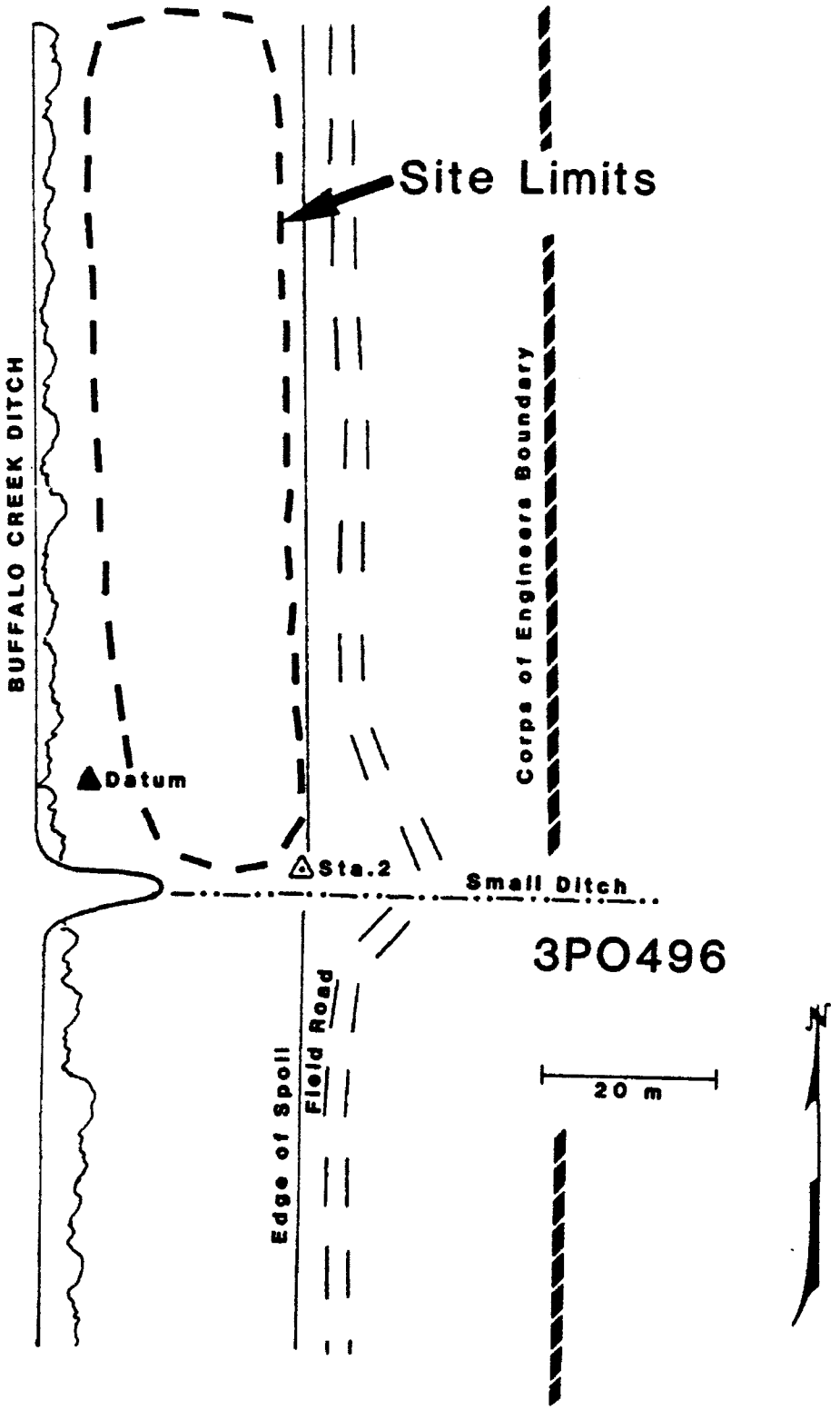


Figure 46. Site Map, 3PO496.

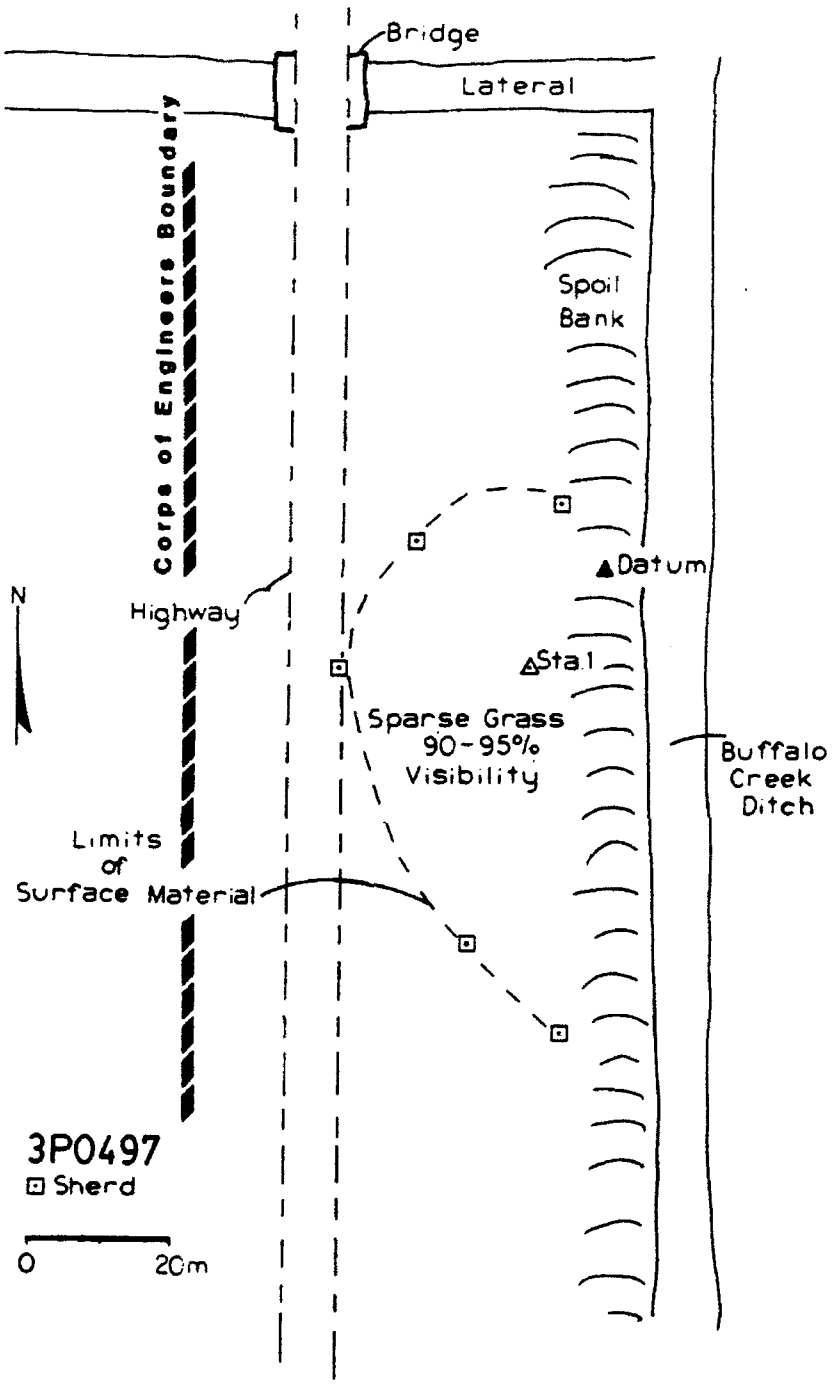


Figure 47. Site Map, 3P0497.

The site is probably buried and has been cut by Buffalo Creek Ditch. It is also possible that 3PO497 is part of 3PO496 located on the east side of the ditch on the spoil.

The ceramics indicate that the site contains a Late Woodland or Barnes phase component in addition to an Early Mississippian component. Only three lithic artifacts were collected. These include two interior flakes and one small pitted pebble.

Table 45. Artifacts Collected on the Surface of 3PO497.

ABBREVIATIONS USED: Ceramics listed by tempers. FC=Fired Clay; PL=Plain; CDM=Cordmarked; IF=Interior Flake; PP=Pitted Pebble.

SHELL			SAND/SHELL	SAND		SAND/GROG	FC	IF	PP	TOTAL
PL	OTR	VR	PL	PL	CDM					
2			3	133	21	1	X	2	1	163

3PO498

Description

Sixty artifacts were observed and collected from the spoil in a area measuring 70 m N-S and 22 m wide at 3PO498 (Figure 48). The site had been tilled and rained on affording a 100% surface visibility. The distribution of the artifacts was mapped with a transit and everything observed was then collected (Table 46). No lithics were found at the site.

Table 46. Artifacts Collected on the Surface of 3PO498.

ABBREVIATIONS USED: Ceramics are listed by temper. PL=Plain; CDM=Cordmarked.

SHELL			SAND/SHELL	SAND		TOTAL
PL	OTR	VR	PL	PL	CDM	
1			12	17	30	60

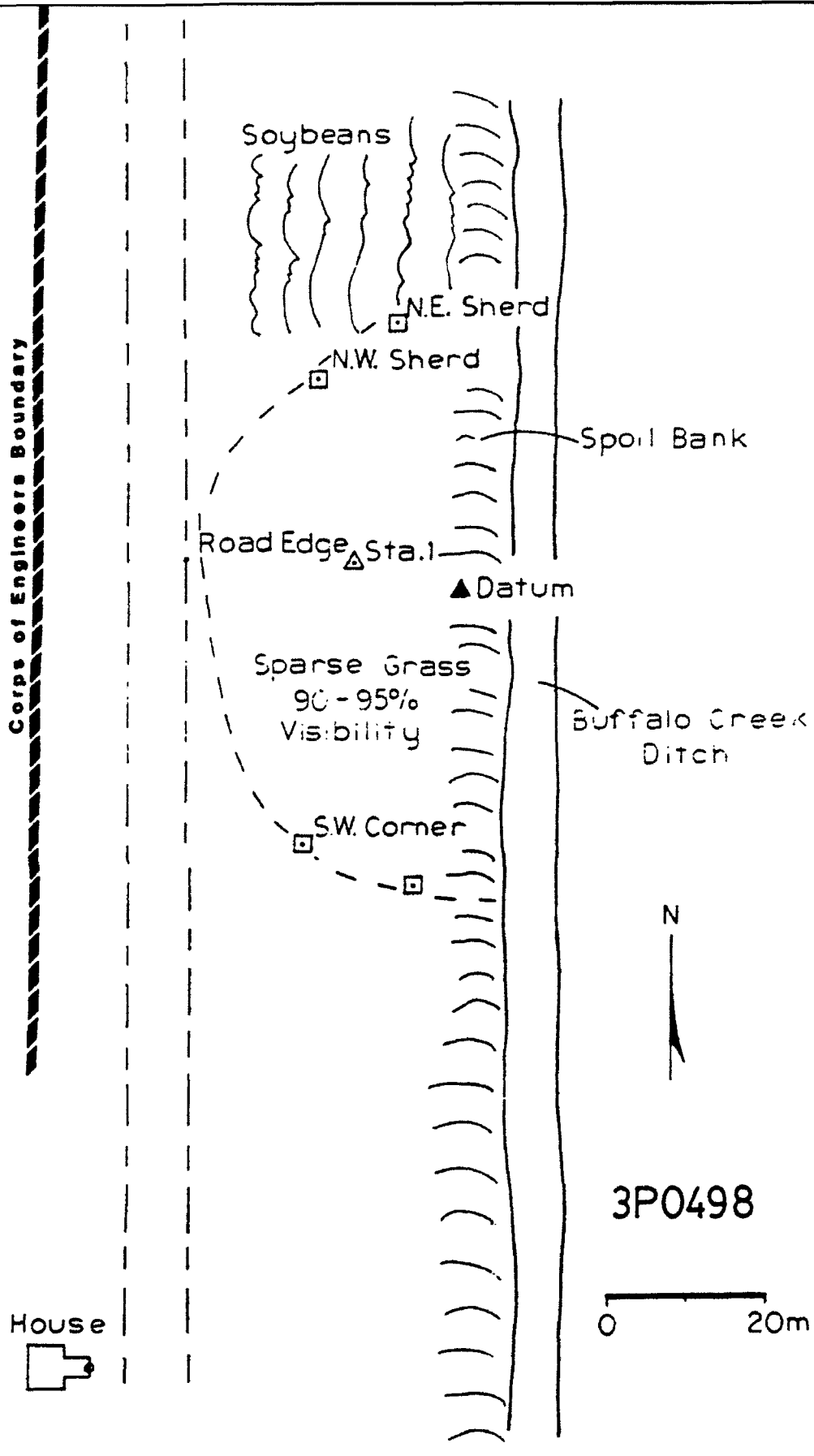


Figure 48. Site Map, 3P0498.

Since the site is confined to the spoil, it also is probably buried and deep subsurface work would be necessary to determine the nature of the deposits. 3PO498 dates primarily to the Barnes phase or Late Woodland period, although there is some evidence of an Early Mississippian component.

3CG914

Description

This site was visited twice during SPEARS survey. During the first visit, sand tempered sherds were observed on the spoil bank along Buffalo Creek Ditch. Part of the spoil was planted in corn, which was mature at the time of the survey. A storm had blown down many of the corn stalks, reducing visibility to about 40%. The site was first recognized in a narrow strip of soybeans planted within the corn field. Visibility between the bean rows was about 80%. Artifacts were observed only on the spoil bank and none were observed on the original ground surface. The bank of Buffalo Creek Ditch was too heavily vegetated to examine. The artifacts extended about 85 m along the spoil bank from the edge of a lateral ditch.

On the second visit to the site, artifacts were again observed only on the spoil bank. The limits of the distribution were mapped with a transit, and all observed artifacts were collected. These included seven shell tempered sherds and 59 sand tempered sherds. Twenty-two of the sand tempered sherds were cordmarked, and two others had a red slip on the interior surface.

Because the artifact distribution continued to the eastern edge of a lateral ditch, the west side of the lateral was also examined during the second visit to the site. Two sand tempered sherds were observed west of the lateral ditch. Both were on the surface of spoil dirt that appeared to be derived from Buffalo Creek Ditch rather than from the lateral ditch.

Since artifacts were observed only on the spoil bank of Buffalo Creek Ditch and none were observed on the original ground surface or on the spoil associated with the lateral ditch, 3CG914 is probably a buried site of unknown extent which has been intersected by previous dredging of Buffalo Creek Ditch. The boundaries of the site have not been determined. It is apparently a Late Woodland and Mississippian site.

ISOLATED FINDS

Introduction

Since the definition of a prehistoric site includes the location of one artifact, isolated finds were recorded during the project. Many of these artifacts were found on the spoil along the ditch bank and therefore may be indications of deeply buried sites cut by the ditch. It is difficult to both look for and find the intact deposits when only a low frequency of artifacts is observed on the surface. Isolated finds collected in the fields may represent redeposited sites.

An isolated find may actually be a result of poor surface visibility. This concept was tested when a return visit to the project area was made after the crops had been removed and surface visibilities were greatly improved. Of four isolated finds initially recorded, and then revisited, additional cultural material was only found at one site.

State Site forms were completed by SPEARS staff for all the isolated finds. However, permanent state numbers were only assigned to sites containing diagnostic lithic artifacts. The other site forms will remain in the site lead file at the Arkansas Archeological Survey Station at Arkansas State University in Jonesboro.

Significance and Recommendations

Based on information presently available on isolated finds, they have a low research priority and are not considered eligible for nomination to the National Register. No further work is recommended at any of these sites in connection with the proposed project.

3MS510

3MS510 was an isolated find of one microcore (FSN 1-1) Plate 4a) made from Burlington-like chert. The bipolar core has been completely exhausted by the removal of microblades from both ends. The core was found in a field road on a spoil bank along Ditch 7. Visibility was reduced by vegetation on the spoil bank, and heavy vegetation prevented an examination of the ditch bank profile. The original ground surface on both sides of the ditch was closely examined, but no other artifacts were observed. The microcore probably represents an Early Mississippian occupation of the area. The site from which the artifact derived remains undiscovered and may be buried.

3MS511

3MS511 was an isolated find of one projectile point fragment (FSN 1-1) (Plate 2c) probably a Late Woodland arrowpoint similar to the provisional "Weona" type. The artifact was found on the surface of a bean field between Ditch 7 and the Little River Floodway levee, closer to the levee than to Ditch 7. Visibility was excellent in the young soybeans in July, but no other artifacts were observed.

When the site was revisited in February, 1987, visibility was about 95% in the harvested beans and near 100% in two nearby disturbances that appeared to be recently backfilled pits where the farmer may have buried trash. No artifacts were observed on the surface, and one shovel test was excavated at the locus where the projectile point was found. This shovel test had a dark brown (10YR3/3) loam plowzone to a depth of 20 cm. From 20 to 27 cm was a very dark grayish brown (10YR3/2) clay loam. From 27 cm to the base of the shovel test at 60 cm was a brown to dark brown clay loam (10YR4/3) mottled with dark yellowish brown concretions (10YR3/4). These did not appear to be anthropic soils, and no artifacts were observed in any part of the shovel test.

The lack of other artifacts or midden in the vicinity of the projectile point and its proximity to the floodway levee (about 30 m suggests that it may have derived from an unknown site disturbed by levee construction. The broken distal tip of the projectile point has rust stain at the edge of the break, indicating that it may have been broken by modern farming or dredging equipment.

3MS512

One untyped projectile point fragment (FSN 2-1, Plate 4b) and one biface fragment (Burlington-like chert) were found at 3MS512. These two artifacts were on a low knoll intersected by the portion of Ditch 7 which parallels the Little River floodway levee. Visibility on the knoll was excellent (in young soybeans), but no other artifacts were observed.

Three shovel tests were excavated on the knoll. No artifacts were found in any of the shovel tests. Shovel Test 1 was 5 m west of Ditch 7 at the edge of the bean field. The plowzone in Shovel Test 1 was a 20 cm brown silt loam. From 20 to 30 cm was a highly mottled soil interpreted to be spoil from Ditch 7. From 30 to 60 cm was a mottled gray silt loam. This profile, except for the spoil, is similar to the typical profile of Bowdre silt loam which is the mapped soil at the site location.

Shovel Test 2 was 17 m east of Ditch 7 between the ditch and the floodway levee, and immediately east of the knoll. The plowzone here was only 10 cm thick, and was a grayish brown

clay loam. Beneath the plowzone from 20 to 40 cm, was a gray clay. This profile fits the description of Tunica clay which is mapped at this location immediately east of the knoll.

Shovel Test 3 was 10 m west of Ditch 7, in the bean field. From 0 to 20 cm was a dark grayish brown (10YR4/2) silt loam plowzone. From 20 to 32 cm was a very dark grayish brown (10YR3/2) clay loam, and from 32 to 50 cm was a brown (10YR 5/3) silt loam. Again, this profile fits the typical Bowdre silt loam profile mapped at this location, and indicates that no anthropic soils are present.

3MS513

One interior flake composed of Burlington chert was found in a tilled field which had 100% visibility. The vicinity where the flake was found was low lying and about 80 m west of the base of the levee. According to the soils map, the isolated find was positioned at the edge of a relict slough, probably related to the Right Hand Chute of the Little River. Natural levee soils begin immediately to the north, south, and west of this locus. The present day channel is about 1/2 mile to the east.

3MS514

Two artifacts, one primary decortication flake and one hammerstone (FSN 1-1) (Plate 7c) were found in a tilled field which had 100% visibility. The hammerstone is a round chert cobble with battering over most of its surface. It is composed of Crowley's Ridge chert. No additional artifacts were observed or collected. These artifacts were at least 75 m from the base of the levee. The soil map indicates that this locus is at the edge of a relict slough probably related to the Right Hand Chute of the Little River and within 50 m of a natural levee. The present day channel is about 1/4 mile to the east.

3MS515

This is an isolated find of one expanded stem projectile point (FSN 1-1) (Plate 1c) found on the spoil bank along Buffalo Creek Ditch. Visibility was near 100% on the spoil bank and was about 50% in a milo field at the foot of the spoil 40 m from the ditch bank. No other artifacts were observed on the spoil bank or in the field. The projectile point is probably a Woodland period artifact and may represent an undiscovered site or may truly be an isolated lost or discarded artifact.

3CG916

At 3CG916, two tiny flakes were observed within a few centimeters of each other in a narrow strip of soybeans planted in a corn field. Visibility in the soybean rows was about 80%, and was about 40% in the surrounding corn field. After an intensive search, no other artifacts were observed, and the two flakes were not collected.

One of the flakes was described in the field as a retouch flake of Crowley's Ridge chert. The other was an interior flake identified as Crescent Quarry. They were each less than 1 cm long.

The two flakes were found 88 m (paced) north of Buffalo Creek Ditch. Because this distance was outside the project boundaries, no subsurface tests were excavated. This site is near 3CG914, a probable buried site identified on the spoil of Buffalo Creek Ditch.

3CG917

A chipped stone adz (FSN 1-1) (Plate 5c) was found on the spoil 30 m north of the Buffalo Creek Ditch bank. The small adz is composed of mottled reddish brown Crowley's Ridge chert. It exhibits some slight use polish on dorsal flake ridges near the distal edge and is characteristic of Late Woodland period adzes. No additional artifacts were observed even though surface visibility in the tilled field was 100%. According to the soils, the locus is on a natural levee consisting of the higher ground between old relict braided stream channels which lie 1-1.5 miles to the east and west. The spoil consisted of very sandy sediments removed from Buffalo Creek Ditch. The site may remain buried in this vicinity.

Site 6

Site 6 was an isolated find of one small sand tempered body sherd. It was found about 40 m south of Ditch 13 at the edge of a cotton field. The field was separated from Ditch 13 by a shallow depression that is apparently the old, natural channel. This depression extends from the bank of Ditch 13 south about 35 meters to the edge of a low terrace and has a heavy ground cover of pasture grass where used, large, farm equipment is stored.

The cotton field had been recently cultivated when it was visited on July 24, 1986. The single sherd was found in a small area that had not been disturbed by recent cultivation and site limits could not be determined in the loose dust.

The site was revisited in December after the cotton had been harvested. The surface had not been tilled since the previous visit and had been heavily rained on. The field within about 50 m of the isolated sherd locus was walked at an interval of

about 3 m. Although visibility was excellent, no other artifacts were observed. Because this was an isolated find of a non-tool artifact, it was not assigned a state site number.

Site 10

One utilized flake (FSN 1-1) was observed and collected from the ditch spoil about 5 m north of the bank of Ditch 13. No additional artifacts were observed even though surface visibility was excellent, 100% in the field road paralleling the ditch and about 70% in the soybean field.

Site 46

One small eroded Barnes cordmarked sherd was found in a milo field west of Big Lake. The entire area was examined for additional artifacts, but none were found during the initial visit to the area or on a subsequent return trip in February. 1987. Surface visibility at the time of discovery was about 50% or less, but on the second visit the surface visibility was improved due to a low winter wheat crop.

Site 48

One plain Barnes sherd was found on the surface of a milo field which at the time of discovery had 40% visibility. The locus is west of Big Lake and is one of the lowest areas within the field. No additional material was observed on a second trip to the area when visibility was greatly increased due to a low winter wheat crop.

Site 59

One plain Barnes sherd was found in a field which has been landleveled. The site was about 70 m east of Buffalo Creek Ditch. The field was planted in soybeans and surface visibility was between 50-60%. The entire area was examined for additional artifacts, but none were found.

Site 60

One plain Barnes sherd was found in the corner of Buffalo Creek Ditch and an east-west lateral ditch. This artifact was found in the field at the base of the spoil. The field had been planted in soybeans and surface visibility was only about 30%. The entire area was examined for additional artifacts, but none were found.

Site 63

Two artifacts were found on the spoil within 10 m of Buffalo Creek Ditch. One is a small eroded Barnes sherd and the other is a utilized flake which has retouch along two breaks and is composed of Crowley's Ridge chert. There is a possibility that this site is buried and lies beneath the field and spoil from the ditch.

REDEPOSITED AND PLOWZONE SITES

Introduction

Redeposited sites differ from the potentially buried sites in that they were not found on obvious ditch spoil and were usually located in the field away from the ditch. In some instances these sites were found in areas where the ground surface has been significantly disturbed such as the intersection of two ditches or between a levee and a ditch. Plowzone sites are those in which artifacts were found only in the upper disturbed level. These sites also have a low potential for truncated features and cultural middens.

Significance and Recommendations

Based on SPEARS investigations at these sites, they do not have sufficient integrity or contain information that would render them eligible for nomination to the National Register. No further work is recommended at these site in relation to the proposed project.

3MS492

Description

During the initial survey of Ditch 13, one plain shell tempered body sherd was found on the surface near the south bank of the ditch. The soil where the sherd was found appeared to be spoil from Ditch 13, with a darker color and sandier texture than soil a few meters south of the ditch. Visibility was excellent in a 4 m wide disked strip adjacent to the ditch, but was near zero in a mature field of soybeans that had been recently cultivated. The disked area was intensively examined but no other artifacts were observed, and the sherd was recorded as an isolated find at that time.

After the beans had been harvested and the field planted in winter wheat, the site was revisited. Visibility was excellent in the young wheat because of recent rain. During this second visit, a few flakes of Crowley's Ridge chert, a tiny fragment of burned bone, and a fragment of a chipped stone hoe (FSN 2) made from Mill Creek chert were observed. These artifacts were widely and thinly dispersed in the wheat field to a distance of about 80 meters south of the ditch, and only two flakes and the burned bone were observed within the 60 m corridor adjacent to Ditch 13. A temporary datum that had been set along the ditch edge had been destroyed by the time of this second visit.

The site was visited a third time in February, 1987. During the third visit, three more flakes, including one flake of Mill Creek chert, and one tiny sand tempered sherd were observed. Three controlled columns were excavated at that time.

Controlled Column 1

Controlled Column 1 was located 73 m south of Ditch 13 at the locus where the Mill Creek hoe fragment was found. A recent plowzone associated with the planting of winter wheat overlay an older plowzone which extended to a depth of 27 cm below the surface. Below the plowzone was a clayey silt which became progressively finer textured with depth. No artifacts or anthropic soils were observed in Controlled Column 1 which extended to 55 cm below the surface.

Controlled Column 2

Controlled Column 2 was located 33 m south of Ditch 13 near a flake of Mill Creek chert found on the surface. An upper and lower plowzone were also observed in Controlled Column 2 extending to a depth of 23 cm. At 25 cm below the surface, one Barnes Cordmarked body sherd was found. This sherd was found in a very dark grayish brown sandy silt which became progressively lighter colored and finer textured with depth. This sediment did not appear to be an anthropic soil and no other artifacts were found in Controlled Column 2 which was excavated to a depth of 60 cm.

Controlled Column 3

Controlled Column 3 was located 20 m south of Ditch 13 near a fragment of burned bone found on the surface. The two plowzones observed in the earlier controlled columns were also present in Controlled Column 3 to a depth of 23 cm. From 23 to 28 cm was an almost black band of coarse sand. No artifacts were observed in this zone. From 28 to 35 cm the texture of the sand became finer and the color lighter. At 48 cm, this medium sand became abruptly coarser, and from 48 to 68 cm the coarse sand contained charcoal, precipitates, and concretions. These episodes of sand deposition probably represent deposits in an active channel and no artifacts were observed in any zone.

Summary

The two plowzones present in the controlled columns indicate that soil had recently been deposited over most of the field south of Ditch 13. This soil may have been derived from the excavation of Ditch 13. Apparently, Controlled Column 3 was located in the abandoned and filled natural channel of the stream course which became Ditch 13. This old channel was visible during the survey as a sinuous, shallow depression roughly parallel to Ditch 13. The surface sediments in the depression were a finer texture and darker color than the nearby terrace edge. The controlled columns indicate that the site is restricted to a disturbed plowzone and, additionally, lies mostly outside the impact zone of the proposed project.

3MS495

Description

Site 3MS495 lies in a small area between Ditch 7 and a levee and south of a bridge. The site is about 25 m x 90 m and contains late twentieth century trash and a light scatter of Late Woodland sherds. At the time of site discovery, two small plain Barnes sherds and one untyped side notched (possibly Woodland) arrowpoint (FSN 1-1) (Plate 2d) were collected. Surface visibility was good, about 85%, and the field was planted in milo. Permission to conduct subsurface testing at 3MS495 was denied by the landowner.

A return trip to the site was made in the winter. The field was still covered in milo and surface visibility was poor. A few artifacts including two small Barnes sherds and recent historic debris were all that were observed in the vicinity of the recorded site. The ditch west of the site was dry and both banks were examined for evidence of cultural deposits. The high spoil pile on the west side of the ditch was also examined. No artifacts were observed in any of these locations. One controlled column was then excavated.

Controlled Column 1

Controlled Column 1 was positioned in the approximate center of the site. The profile of this test is shown in Figure 49. All artifacts, which consisted of only twentieth century historics, were collected in the upper plowzone level. Below the plowzone was mottled sand, probably ditch spoil. Below it was a loose mottled sand which did not contain cultural material. No prehistoric artifacts or cultural strata were observed in this test and it is possible that the cultural material found here has been redeposited from soil used in levee or bridge construction.

3MS496

Description

When this site was first discovered it consisted of a very light scatter of artifacts within a 10 m diameter area west of the Big Lake Levee (Figure 50). Artifacts noted on the surface included five Barnes sherds, four flakes, and two cobble fragments. The field was planted in soybeans and visibility was about 85%. No collections were made at that time because it was felt the site needed initial site testing.

On a return visit, the entire area was re-examined, but visibility was less due to a maturing soybean crop. A permanent datum was established at the site and only one artifact was observed and mapped. It is a sandstone cobble which has been used as both a hammerstone and an anvil (FSN 3). One test unit and two controlled columns were then excavated.

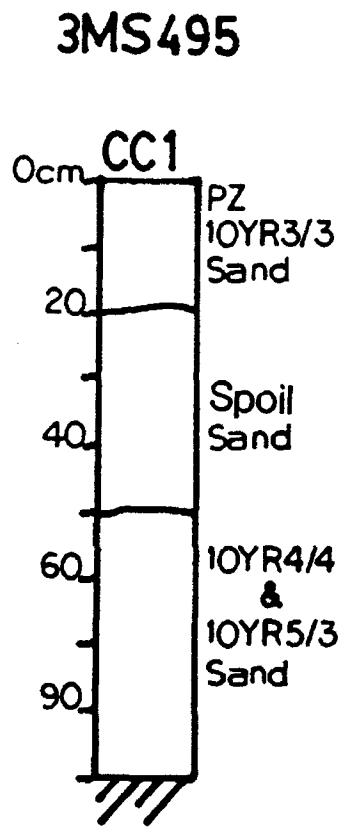


Figure 49. Profile of Controlled Column 1, 3MS495.

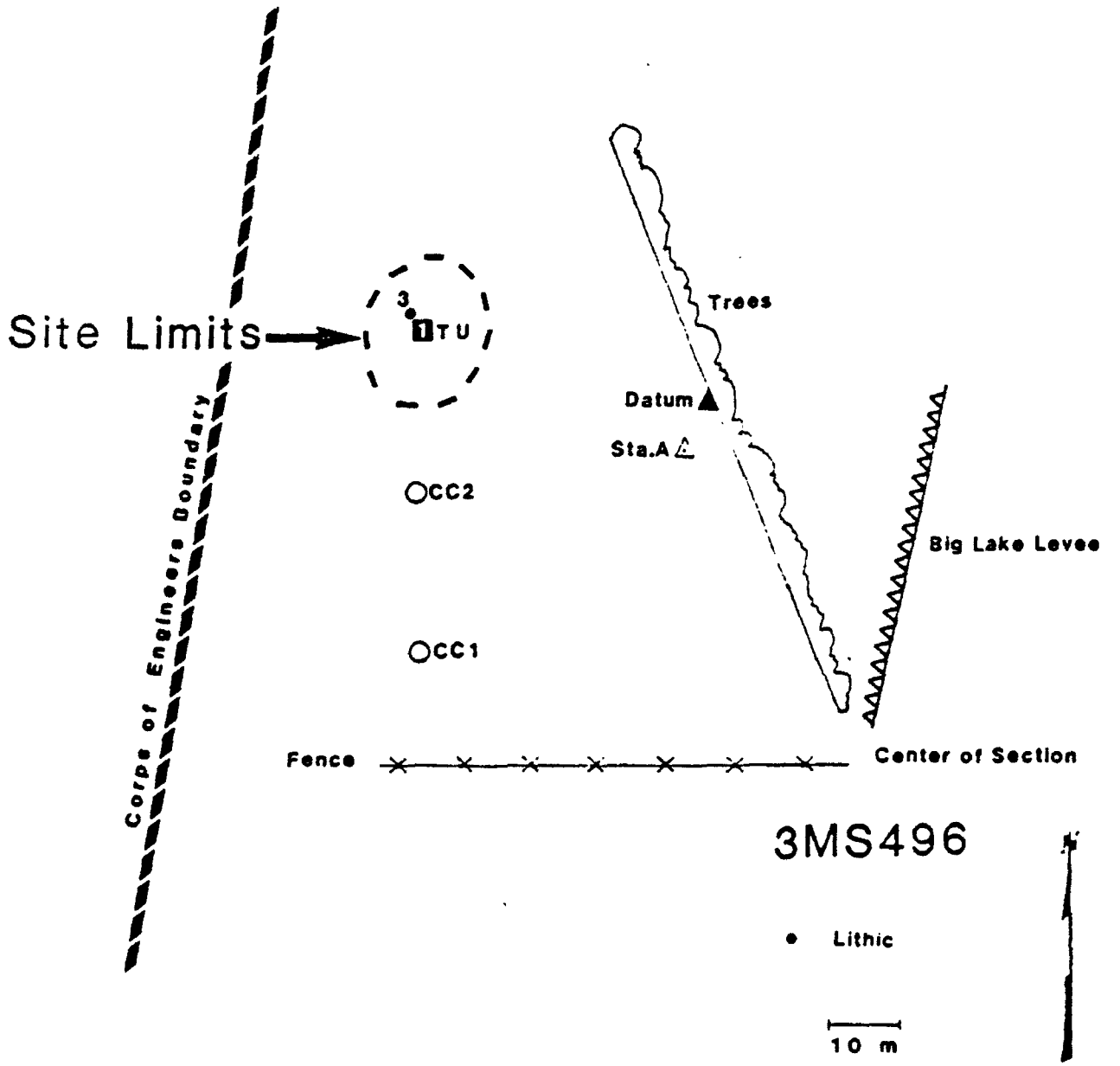


Figure 50. Site Map, 3MS496.

Test Unit 1

Test Unit 1 was positioned in the center of the previously recorded surface scatter. One plain sand tempered sherd was found on the surface of this test. The profile of Test Unit 1 is shown in Figure 51. The unit was extremely dry and compact and the sediments were difficult to screen. The plowzone extended from 0-23 cm and it contained the only artifacts. These are listed in Table 47. Below the plowzone were darker sediments, but because no cultural materials were found, it was not considered a midden. Another sediment change was found at 42 cm and it likewise did not contain material. Due to the difficulty of excavating further, this unit was terminated at 46 cm below the surface.

Table 47. Artifacts Collected at 3MS496.

LOCATION	SAND TEMPERED SHERDS		FIRED CLAY	HAMMER STONE	UNMODIFIED STONE	TOTAL
	PLAIN	CORDMARKED				
SURF MAPPED				1		1
TU 1 SURF	1					1
TU 1 0-13			2		2	4
TU 1 13-23	2					2
TOTAL	3		2	1	2	8

Controlled Column 1

Controlled Column 1 was excavated to 40 cm below the surface. No cultural material was found in this unit. The sediments consisted of a plowzone level from 0-20 cm and a compact sterile silty clay loam below.

Controlled Column 2

Controlled Column 2 was excavated to 60 cm below the surface. The plowzone consisted of a silty clay loam from 0-20 cm. Below it from 20-30 cm was a compact silty clay. From 30-40 cm there was a dark gray highly organic level which did not contain cultural material. From 40-60 cm the sediments consisted of a very compact gray clay which was difficult to excavate.

Summary

The results of the investigations at 3MS496 indicate that intact deposits do not remain in the vicinity of the few artifacts observed on the surface. The origin of the cultural material is not known. There is a possibility that the Big Lake Levee construction had disturbed a site and that some of the artifacts have been smeared over the landscape. Due to the low

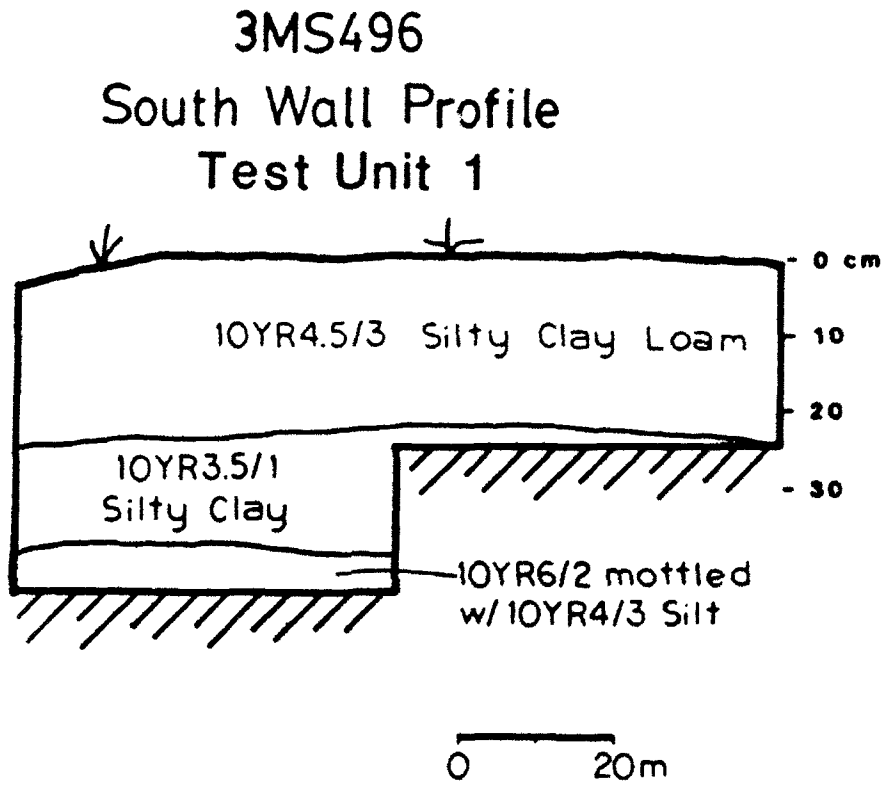


Figure 51. Profile of Test Unit 1, 3MS496.

density of material and the lack of intact deposits, the site is not considered potentially eligible for nomination to the National Register.

3MS497W

Description

The site as first observed consisted of an elongated scatter of Barnes sherds and one Mississippian sherd located in a cotton field on the west side of Buffalo Creek Ditch. Surface visibility was about 80%. Site size was estimated as 35 m x 10 m. (Figure 52).

On a second visit to the site all artifacts observed on the surface were mapped and one test unit was positioned near the center of the cluster of artifacts. The material on the surface is listed in Table 48. The projectile point (FSN 2-1) (Plate 4c) is a broad corner notched type similar to a Marcos or Big Creek type. It is composed of a white chert.

Table 48. Artifacts Collected on the Surface of 3MS497W. ABBREVIATIONS USED: CORDM=Cordmarked; PP/K=Projectile Point/knife.

SHELL	SAND		SAND/GROG		PP/K	TOTAL
PLAIN	PLAIN	CORDM	PLAIN	DEC		
1	9	4	2	1	1	18

Test Unit 1

Only one plain Barnes sherd was collected in the plowzone (0-10 cm) level of Test Unit 1. Directly beneath the plowzone the sediments in the unit were extremely varied and consisted of brown sand, yellow sand, and gray clay. From 20-30 cm the sediments continued to be mixed (Figure 53). Only the southwest quarter of the unit was excavated to 45 cm below the surface. Just as the unit was being completed, the farm manager stopped by and explained that he had taken soil from the spoil and dumped it in this low spot. He motioned toward the area of spoil which lies west and across the ditch from 3MS497. The artifacts found at this site 3MS497W are believed to have been derived from 3MS497.

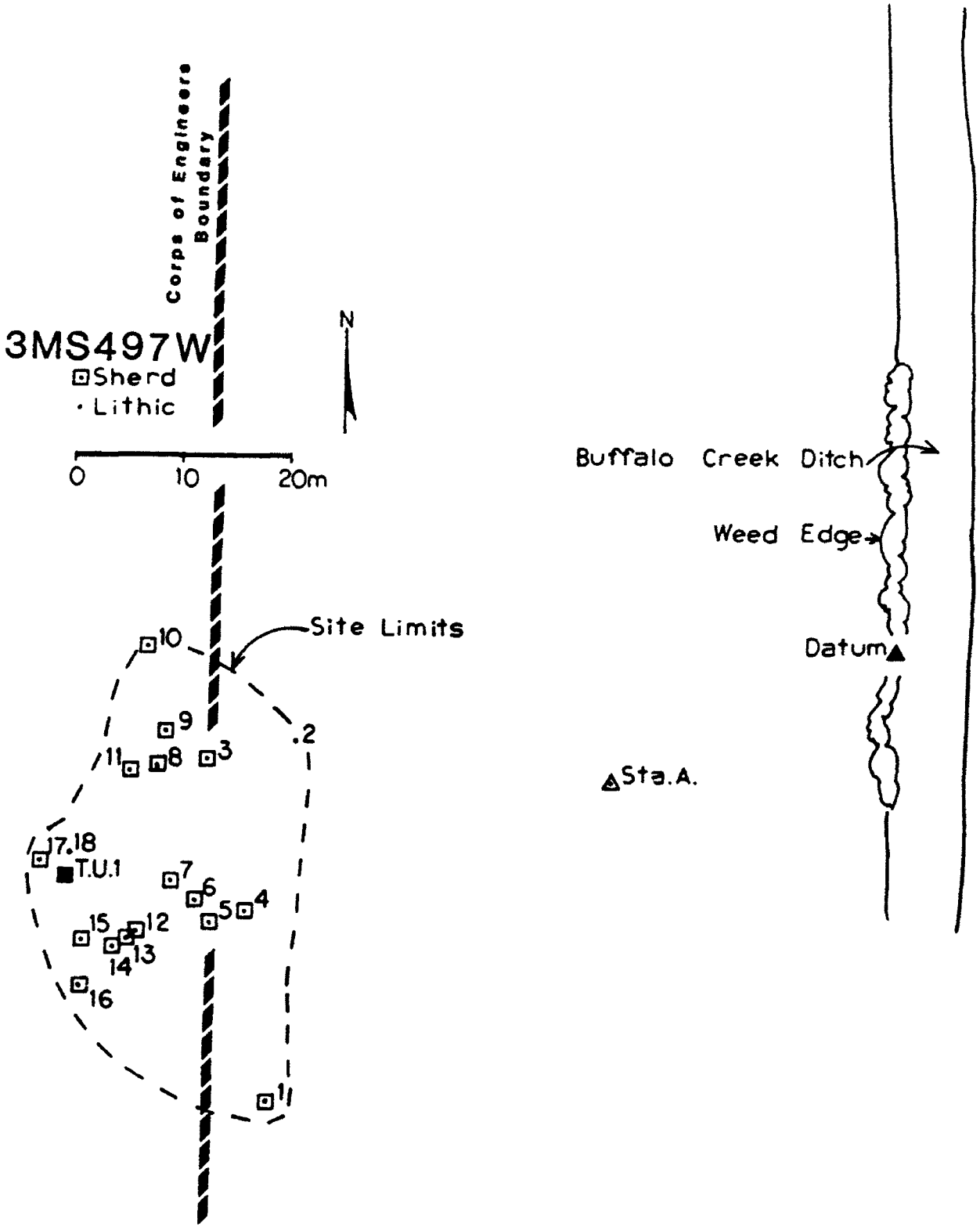


Figure 52. Site Map, 3MS497W.

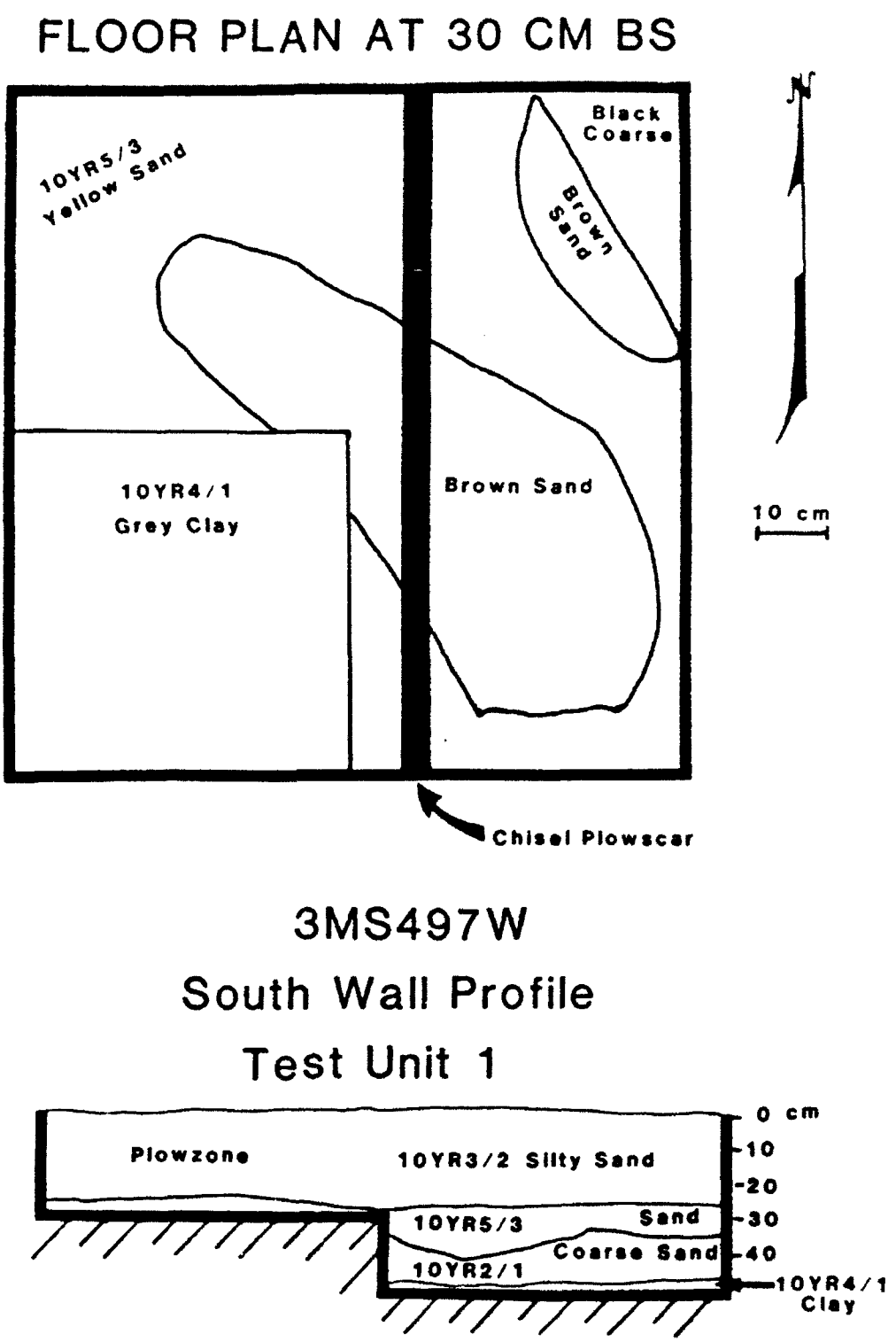


Figure 53. Floor Plan and Profile of Test Unit 1, 3MS497W.

3MS499

Description

Four tiny, sand tempered sherds were found in a milo field during SPEARS first visit to 3MS499 in August, 1986. Although surface visibility was about 70% in a maturing milo field, artifacts were hard to identify. The ground surface was very flat, giving the impression that it had been precision land leveled and flooded. Those few sherds which were observed barely projected above the flat ground surface and, additionally, were coated with a thin film of sediment. The owner would not allow subsurface tests in the milo, and site boundaries could not be established. During a brief revisit to the site in February, 1987, four shovel tests were excavated in the vicinity of a thin scatter of sherds observed on the surface. None of these shovel tests contained artifacts or anthropic soils.

Sand tempered sherds were thinly scattered over an area about 50 m x 20 m at the western edge of the impact zone of the ditch cleanout project. Visibility ranged from 70% in the harvested milo to 95% in recently sprouted winter wheat. Fewer than ten sherds were observed and all had eroded surfaces, suggesting that they had been in the plowzone for some time.

Two shovel tests were excavated along the western edge of the project impact zone and two more were excavated about 20 m east of the first tests. All of the shovel tests had similar profiles. In Shovel Test 1, the plowzone was dark brown fine silty sand 20 cm thick. From 20 to 33 cm was a very dark grayish brown silt loam, and from 33 cm to greater than 50 cm was a brown to dark yellowish brown silty clay. No cultural materials were found in any of the shovel tests.

3MS508

Description

Site 3MS508 is a small Late Woodland site located in a low lying pasture. It may be a continuation of 3MS507 which lies immediately south (Figure 54). This site was found while screened shovel tests were being conducted on transects through a heavily vegetated area. Five shovel tests and one controlled column were excavated in the area, in addition to shovel tests on transects. All shovel tests and controlled columns were screened. One small eroded sand tempered sherd and one piece of fired clay were found on the surface south of the pasture in a tilled area.

Controlled Columns and Shovel Tests

Profiles of Controlled Column 1 and Shovel Test 4 are shown in Figure 55. The only artifacts collected in a subsurface test were eight small plain tempered sherds found at about 25 cm below

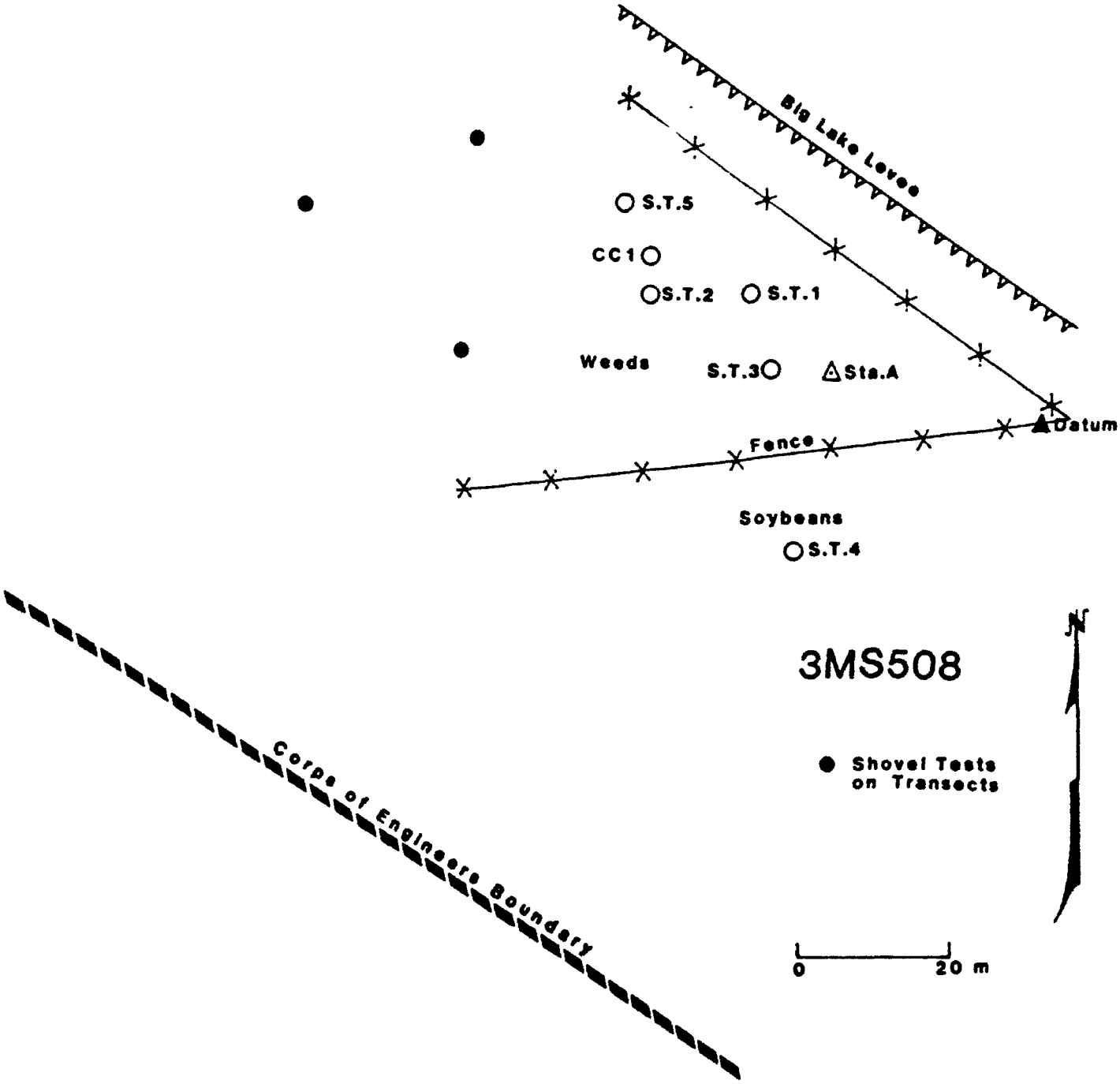


Figure 54. Site Map, 3MS508.

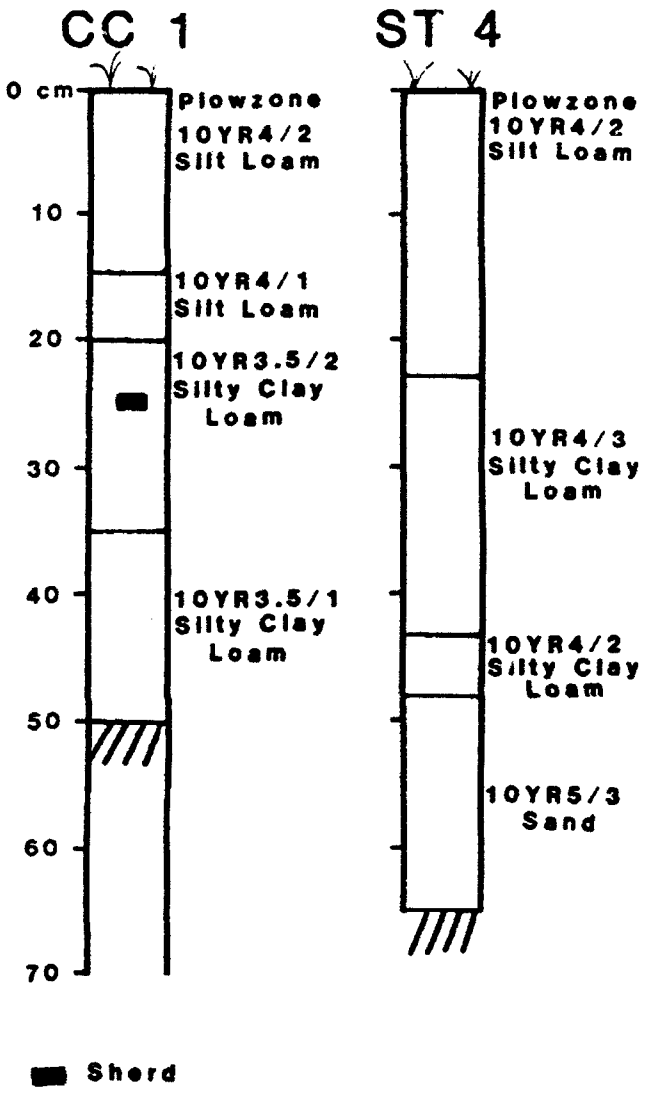


Figure 55. Profile of Controlled Column 1 and Shovel Test 4, 3MS508.

the surface in Controlled Column 1 (Table 49). This unit contained a plowzone which was followed by a 10 cm sterile gray band. The sherds were collected from a dark mottled sediment which did have flecks of charcoal. None of the other shovel tests contained this sediment and due to varied soils in each test and all within a small areas, it is likely that this area has been disturbed and the artifacts are redeposited. The sediments in general were highly organic and gleyed, a characteristic of low lying areas. Many of the shovel tests on this transect were water saturated.

Table 49. Ceramics Collected at 3MS508.

ABBREVIATIONS USED: PL=Plain; P=Ceramic Particles.

LOCATION	SHELL				SAND/SHELL		SAND	SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL CDM					
surf FSN2							1			1		2
ST 1 15cm							8					8
TOTAL							9			1		10

3MS509

Description

3MS509 is a disturbed Woodland and Mississippian site which was found during shovel tests on transects through a weedy pasture with no surface visibility. The narrow field is situated between the Big Lake Levee and a drainage ditch (Figure 56). When the site was first discovered, shovel tests were excavated every 30 m down the center of the field which is at most 30 m wide. Out of the first six tests excavated, four contained from 1-6 sherds (Table 50). The soil was so hard and parched that it was difficult to distinguish sediment colors. The artifacts, however, were found at all depths down to 50 cm.

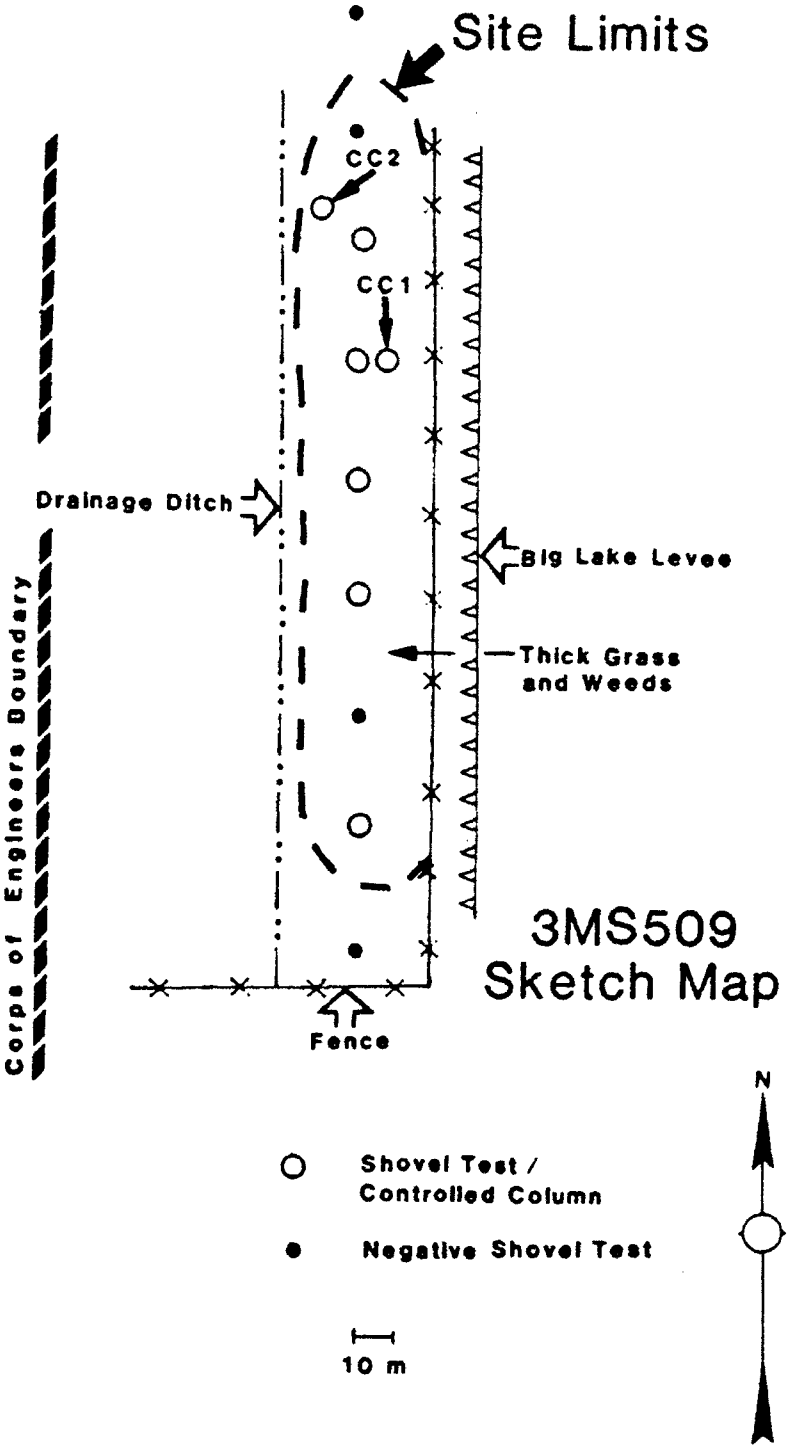


Figure 56. Site Map, 3MS509.

Table 50. Ceramics Collected at 3MS509.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; DEC=Decorated; CDM=Cordmarked.

LOCATION	SHELL				SAND/SHELL			SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC		PL	CDM					
ST1 26 cm	4					1	film	1						6
ST4 30-50								3						3
ST5 33-50									1					1
ST6 20-30	1							1						2
ST7 24 cm	2													2
CC1 20-35					1									1
CC2 25-40					1									1
TOTAL	7				2	1		5	1					16

During the winter, the site was revisited and two controlled columns were excavated. At this time there was sufficient soil moisture that the units were much easier to excavate and soil colors were easier to distinguish. The profiles of these two units are shown in Figure 57. In Controlled Column 1 only one sherd was found in the upper plowzone level. In Controlled Column 2, four different sediments were distinguished giving the profile a banded appearance. Only one sherd was collected from this test between 25-40 cm in what was interpreted as a sub-plowzone level. Due to the variation of sediments in all these tests and the location of the cultural material in an area interpreted as being heavily impacted (levee and ditch construction), it is unlikely that intact deposits remain.

3MS509

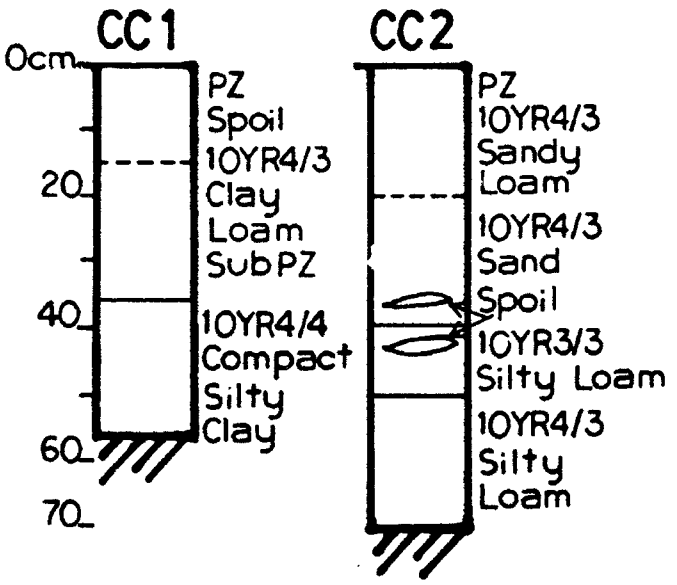


Figure 57. Profiles of Controlled Columns 1 and 2, 3MS509.

SITES OUTSIDE THE PROJECT BOUNDARY

Introduction

Several archeological sites were located on or near the edge of the project corridor. In these situations, subsurface tests were placed inside the right of way in order to examine the nature of deposits and to determine if the project would adversely affect the site. In some instances, subsurface tests did not disclose intact deposits inside the corridor and only a few artifacts were found on the surface inside the corridor. The remainder of the site lying outside the project area has yet to be evaluated according to National Register criteria. No further work is recommended at these locations in relation to the proposed project.

In a few cases archeological sites were found while gaining access to and from the project area. These sites have yet to be evaluated according to National Register criteria.

3MS43

Description

This is a previously recorded site outside the Scope-of-Work of Iroquois Research Institute's Ditch 81 investigations. It has also been determined to be outside the impact zone of the present archeological survey.

3MS43 extends more than 300 meters along an old natural levee remnant almost parallel to the Little River floodway levee. The surface distribution of artifacts is mostly outside the 350 foot corridor of the Ditch 7 cleanout project. One shovel test and two controlled columns were excavated near the edge of the surface distribution.

Table 51. Ceramics Collected at 3MS43.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; CDM=Cordmarked; FC=Fired Clay; P=Ceramic Particles.

FSN	LOCATION	SHELL	SAND		FC	P	TOTAL
		PL	PL	CDM			
2	Surface		10	4			14
3	CC1 0-24		1	1			2
4	CC2 0-28		2		2	X	4
5	CC2 28-38				4	X	4
6	CC2 38-48	3	7	2	10		22
	TOTAL	3	20	7	16		46

Table 52. Lithics Collected at 3MS43.

ABBREVIATIONS USED: M=Microblade; PT=Preform.

FSN	LOCATION	M	PT	TOTAL
1	Surface	1	1	2
	TOTAL	1	1	2

Controlled Column 1

Controlled Column 1 was located 345 ft west of the foot of the floodway levee. This location is 5 ft into the western edge of the impact zone of the ditch cleanout project, and is at the eastern edge of the distribution of artifacts associated with 3MS43. From 0 to 24 cm deep in Controlled Column 1, there was a dark brown sandy clay loam plowzone (Figure 58). From 24 to 50 cm was a pale brown medium sand. The plowzone was excavated and screened as one unit, and the lower stratum was excavated and screened in 10 cm levels. Two sand tempered sherds were recovered from the plowzone, and no artifacts were found below the plowzone (Table 51). The profile is typical of Crevasse loamy sand, which is mapped at this location (Ferguson and Gray 1971:10).

Controlled Column 2

Controlled Column 2 was located 125 m west of the floodway levee. This was outside the project impact zone and on the eastern edge of the natural levee occupied by the site. The plowzone in Controlled Column 2 was 28 cm deep (Figure 58). It was a dark brown sandy clay loam. From 28 to 34 cm was a yellowish brown medium sand with fragments of rounded charcoal. Below the sand, from 34 cm to greater than 49 cm, was a dark grayish brown silty clay loam. This lower stratum contained both shell tempered and sand tempered sherds (Table 51) and is interpreted to be a Woodland and Mississippian midden. No artifacts were found in the sand lens from 28 to 34 cm, and only two sand tempered sherds were found in the plowzone.

Shovel Test 1

One shovel test was excavated between Controlled Columns 1 and 2, at 350 ft from the foot of the levee. No artifacts were found in this shovel test, and the profile was identical to Controlled Column 1.

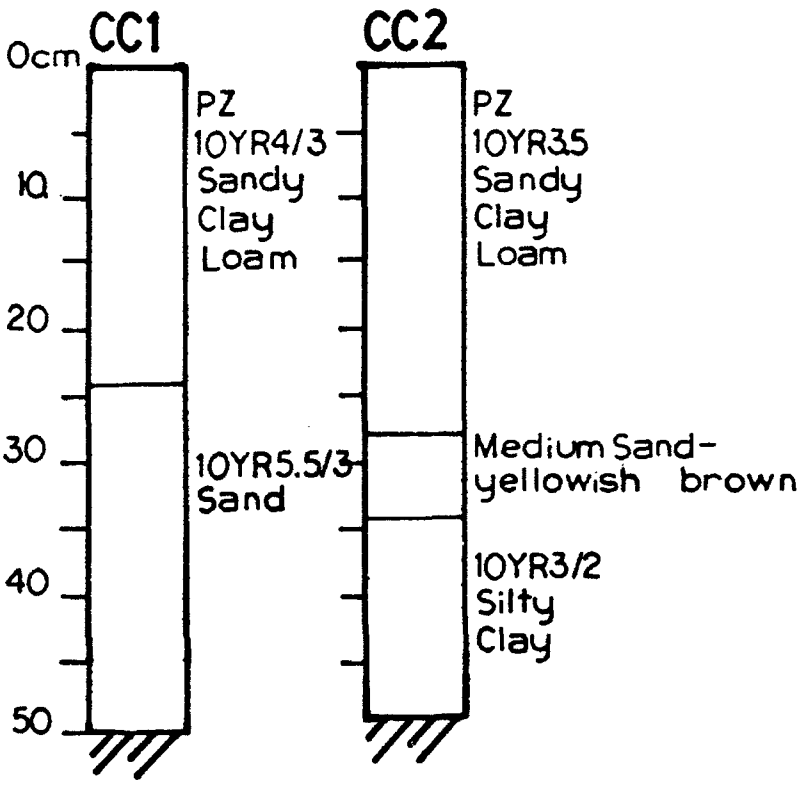


Figure 58. Profiles of Controlled Column 1 and 2, 3MS43.

Summary

Because the site was found to be outside the project impact zone, no controlled surface collections were made and no further subsurface tests were conducted. One small surface collection was made at the north end of the site where a microblade of Burlington-like chert (FSN 1-1) (Table 52) was observed. The blade and all surface artifacts within a one meter radius were collected. This collection contained 14 sand tempered sherds, four of which were cordmarked (Table 51, FSN 2), and one preform thinning flake (FSN 1-2) of Crowley's Ridge chert. A general examination of the surface, in a cotton field with 85% visibility, showed the site to be about 300 meters long north to south and 125 meters east to west. Artifacts observed, but not collected, included both shell tempered and sand tempered sherds in a moderately dense scatter over the entire 300 m x 125 m site area. These observations indicated that no intact subsurface deposits lie within the corridor surveyed by SPEARS and that a very low density of surface artifacts occurs within the corridor. These artifacts have been transported downslope by farming operations and erosion from the edge of the natural levee which the site occupies.

3MS500

Description

When this site was first visited in early August, 1986, one sand tempered sherd was observed in a bean field near the western edge of the project impact zone. A second sherd was observed about 100 meters from the first. Although visibility ranged from 70% in a milo field to 90% in the bean field, no other artifacts were observed.

The site was revisited in late August, a permanent datum was set, and a sketch map was made. However, no artifacts were observed during this second visit. At the landowner's request, no subsurface tests were excavated in the maturing crops.

In February, 1987, the site was visited again. The beans and milo had been harvested and the field replanted in winter wheat. Visibility in the young wheat was about 95%. A thin scatter of small, eroded, sand tempered sherds was observed just outside the western edge of the project area. Most of the sherds were outside the project boundary. Only one artifact, a small core of Burlington-like chert, was collected. It was the eastern-most artifact observed, and was 105 m west of the foot of the Big Lake levee. One shovel test was excavated to 51 cm below the surface. From 0 to 17 cm was a brown to dark brown silt loam plowzone, and from 17 cm to greater than 51 cm was a brown to dark brown silty clay. No cultural materials were found in this shovel test. The surface distribution was determined to be mostly outside the project boundary, with no intact subsurface deposits inside the boundary.

3MS516

Description

3MS516 was a light scatter of sand tempered sherds outside the project right-of-way. Three sherds, two of which were cordmarked, were found on a low, sandy rise about 135 m north of Ditch 7. Although visibility was excellent in a young cotton field, no other artifacts were observed. Since the site was outside the project area, no subsurface tests were conducted.

3MS517

Description

This site was first identified by a scatter of historic artifacts and prehistoric sherds in a soybean field. Only one artifact, an interior flake of Burlington-like chert, was observed within the impact zone of the ditch cleanout project. One Barnes cordmarked body sherd was collected at the edge of the project right-of-way, a surface collection was made outside the impact zone, and two controlled columns were excavated to aid in defining the site.

Surface Collections

One Barnes Cordmarked sherd (FSN 2-1) was found at 120 m west of the Big Lake levee. This is just outside the project right-of-way. Artifacts farther outside the right-of-way were collected as part of a general surface collection (FSN 3). These artifacts included one plain, shell tempered sherd; three plain, sand tempered sherds; one cordmarked, sand tempered sherd; and four small fragments of fired clay (Table 53). One historic, white stoneware marble (FSN 1) was also collected on the surface outside the project right-of-way.

Table 53. Artifacts Collected at 3MS517.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; CDM=Cordmarked; FC=Fired Clay; BTFLK=Bifacial Thinning Flake; and FCR=Fire Cracked Rock; O=Other.

FSN	LOCATION	SHELL	SAND		FC	BTFLK	FCR	O	TOTAL	
		PL	PL	CDM						
1	SURF							1	1	HISTORIC MARBLE
2	SURF			1					1	
3	SURF	1	3	1		1	2		8	
4	CC1 0-24				1				1	
6	CC2 0-20		1						1	
7	CC2 20-50		5						5	
TOTAL		1	9	2	1	1	2	1	17	

Controlled Columns

Although visibility was excellent in a 9 m wide disked strip across the site, site boundaries in adjacent bean fields could nct be adequately mapped. To determine whether a portion of the site was within the impact zone of the ditch cleanout project, two 50 cm x 50 cm controlled columns were excavated.

Controlled Column 1

Controlled Column 1 was located just outside the project impact zone at 120 m west of the Big Lake levee. A recent plowzone of loose silt loam overlay a more compact older plowzone (Figure 59). These two levels were excavated as one and extended to a depth of 24 cm. Only one fragment of fired clay was found in this plowzone level. A more homogeneous silt loam below the plowzone was also excavated as one level to 60 cm below the surface. No prehistoric artifacts were found in this zone. Some historic artifacts were found between 24 and 60 cm. These included: one small fragment of unidentified metal, four small fragments of clear glass, one fragment of light blue glass, and one brick fragment. A soil core in the bottom of Controlled Column 1 showed increasing clay content to 82 cm below the surface where the sediment became too compact to penetrate with the soil coring tool.

Controlled Column 2

Controlled Column 2 was located inside the project right-of-way, 90 m west of the Big Lake levee. The plowzone, from 0 to 20 cm deep, was excavated as one level (Figure 60). This level contained one plain, sand tempered sherd and historic artifacts. The historic artifacts included two unidentified iron fragments, four fragments of clear glass, three whiteware sherds, and six tiny brick fragments. Historic artifacts are discussed in a following section.

Level 2, from 20 to 50 cm, contained five tiny, plain, sand tempered sherds and two glass fragments. No intact cultural levels were identified. One feature was identified as an historic post hole, with a distinct outline and a dark fill (Figure 60). A soil core was used to sample the sediment to 93 cm. The silt loam became lighter colored and sandier with depth.

Summary

The distribution of artifacts outside the project impact zone indicated that 3MS517 may be a significant prehistoric site with Woodland and Mississippian components. However, surface distributions and excavated controlled columns indicate that no intact prehistoric components are present within the project impact zone. The small size and eroded surfaces of sherds recovered from the controlled columns suggest that the artifacts have been transported by erosion and/or by agricultural practices. A historic component is also primarily outside the project impact zone and dates to the twentieth century.

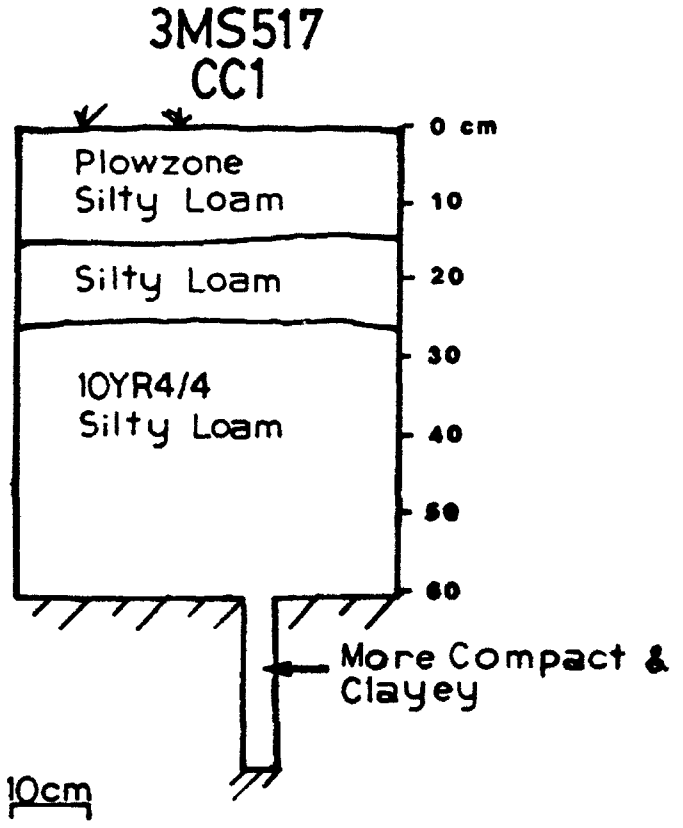


Figure 59. Profile of Controlled Column 1, 3MS517.

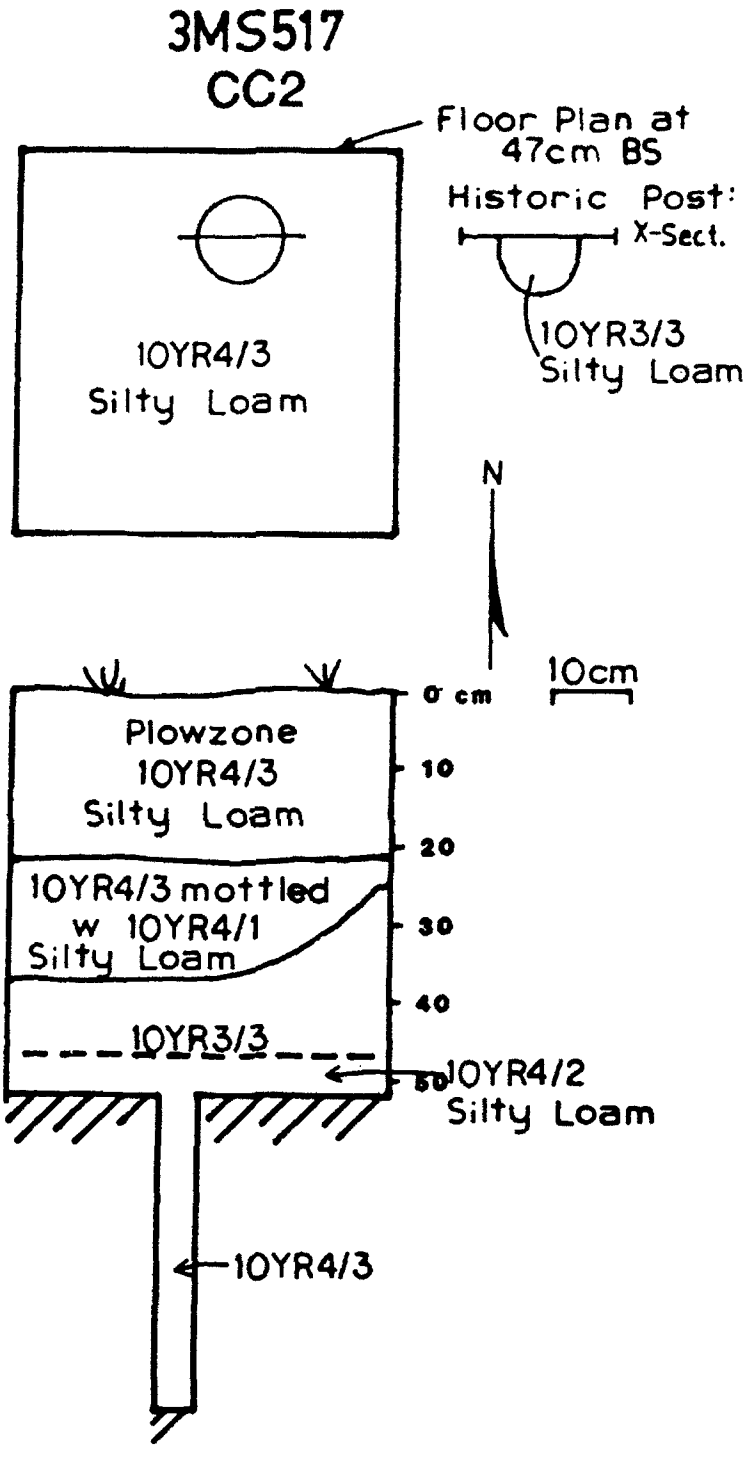


Figure 60. Floor Plan and Profile of Controlled Column 2, 3MS517.

Description

During SPEARS initial survey of Buffalo Creek Ditch, a light scatter of prehistoric artifacts was observed at the eastern edge of the project corridor. One biface fragment (FSN 1-1) utilized as a scraper and one plain, shell tempered sherd were collected at that time. During a later visit, a 1 m x 1 m test unit was excavated, a permanent datum was established, and all artifacts observed on the surface were mapped and collected individually (Figure 61).

Surface Collections

To map the surface collection, an east-west baseline was established across the entire width of the observed artifact distribution and the provenience of each artifact was measured along and perpendicular to the baseline. Including the two artifacts collected during the first visit to the site, a total of 25 sherds, three pieces of fired clay, and four lithic artifacts were collected (Tables 54 and 55).

Table 54. Ceramics Collected at 3MS518.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain; CDM=Cordmarked; FC=Fired Clay.

FSN	LOCATION	SHELL	SAND/SHELL	SAND		FC	TOTAL
		PL		PL	CDM		
2 -32	Mapped	7	4	11	3	3	28
33	TU1 0-9					6	6
34	TU1 9-19					12	12
	TOTAL	7	4	11	3	21	46

Table 55. Lithics Collected at 3MS518.

ABBREVIATIONS USED: B=Biface; SFLK=Secondary Decortication Flake; UNMOD=Unmodified Stone.

FSN	LOCATION	B	SFLK	IFLK	UNMOD	TOTAL
1	Surface	1				1
10	Surface			1		1
12	Surface				1	1
21	Surface		1			1
	TOTAL	1	1	1	1	4

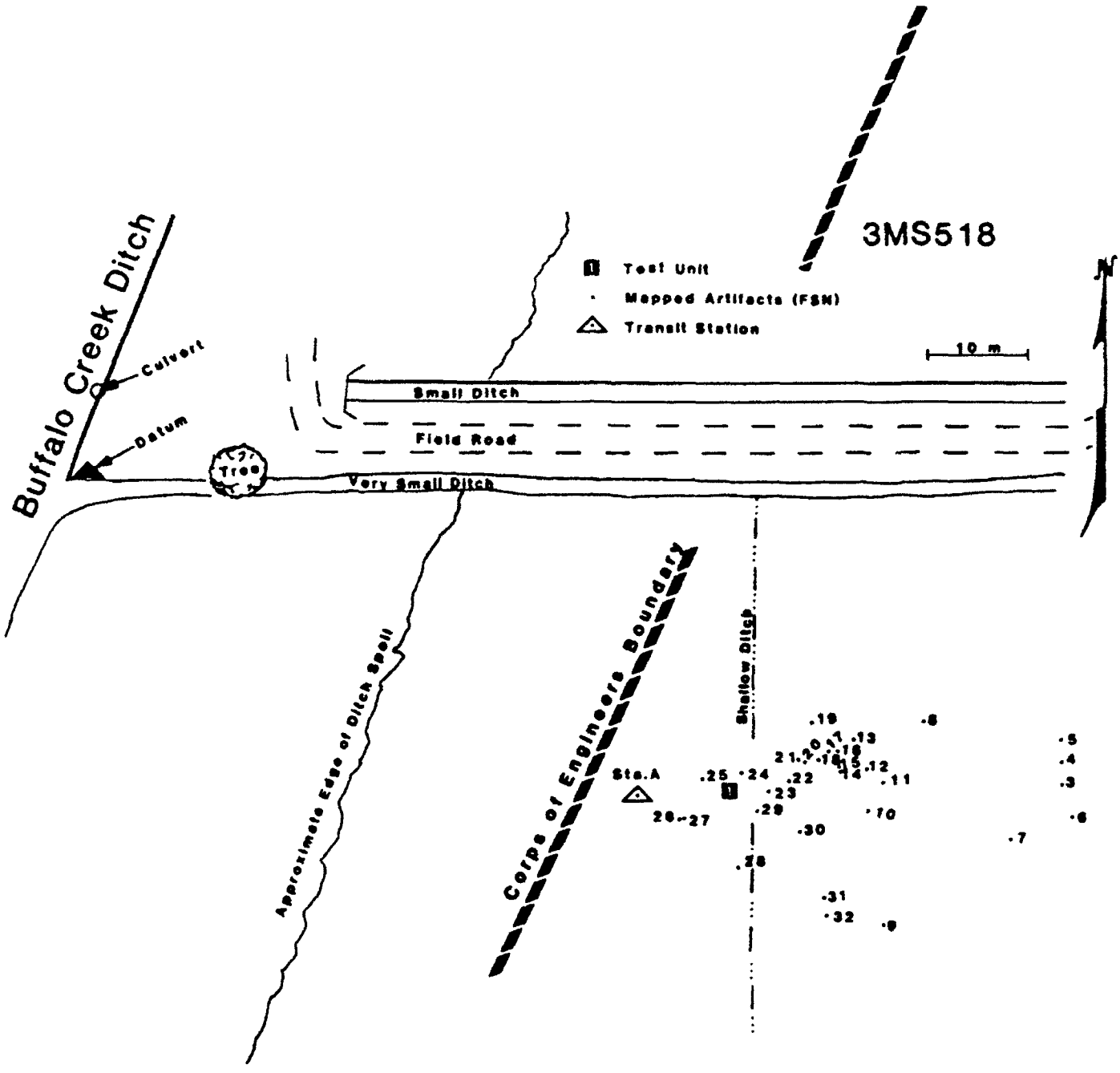


Figure 61. Site Map, 3MS518.

Test Unit 1

Test Unit 1 was the only subsurface excavation at 3MS518. This was a 1 m x 1 m unit located at the western edge of the surface distribution, about 10 meters outside the project corridor (Figure 62).

The plowzone was very shallow, averaging 7 or 8 cm (Figure 62). This shallow plowzone was confirmed by the landowner who visited the site during the excavation and said that this site was regularly plowed very shallowly. The dark gray clay plowzone contained no artifacts, but did contain small bits of fired clay. The fired clay probably resulted from historic land clearing. The landowner's father had originally cleared this site for farming in the 1920s.

Below the plowzone, from 9 to 19 cm, was a zone of gray clay with iron-manganese concretions. This zone also contained fragments of fired clay and may be an older plowzone. No artifacts were found in this zone.

Below 19 cm and extending to a depth of 65 cm were massive iron-manganese concretions with some gray clay and only the southeast quarter of Test Unit 1 was excavated below 29 cm. The southeast quarter was excavated to 120 cm to investigate the geomorphic history of the site. All of the deposits appear to be channel fill deposits.

Summary

No artifacts were found in Test Unit 1, and artifacts on the surface were thinly scattered outside the impact zone of the proposed ditch cleanout project. The fired clay in Test Unit 1 and on the surface appeared to be of historic origin and probably resulted from land clearing in the 1920s.

Test Unit 1 was excavated within an old stream channel and the lower levels of Test Unit 1 were deposited in an active stream environment. The upper levels of Test Unit 1 may be slackwater deposits, and the massive iron-manganese concretions indicate that the sediments have been frequently saturated over a long period of time. The test unit was located on a mapped boundary between Iberia clay and clayey soils of the Sharkey-Steele complex.

The Iberia clay probably represents a filled braided stream gathering channel. The surface distribution of artifacts on the eastern edge of the Iberia clay probably represents prehistoric occupation on the eastern edge of an abandoned channel.

This occupation includes at least two components, one Mississippian and one Late Woodland. The combination of shell and sand tempering in some sherds may indicate that the Mississippian occupation was Early Mississippian. These components are located outside the boundary of the present

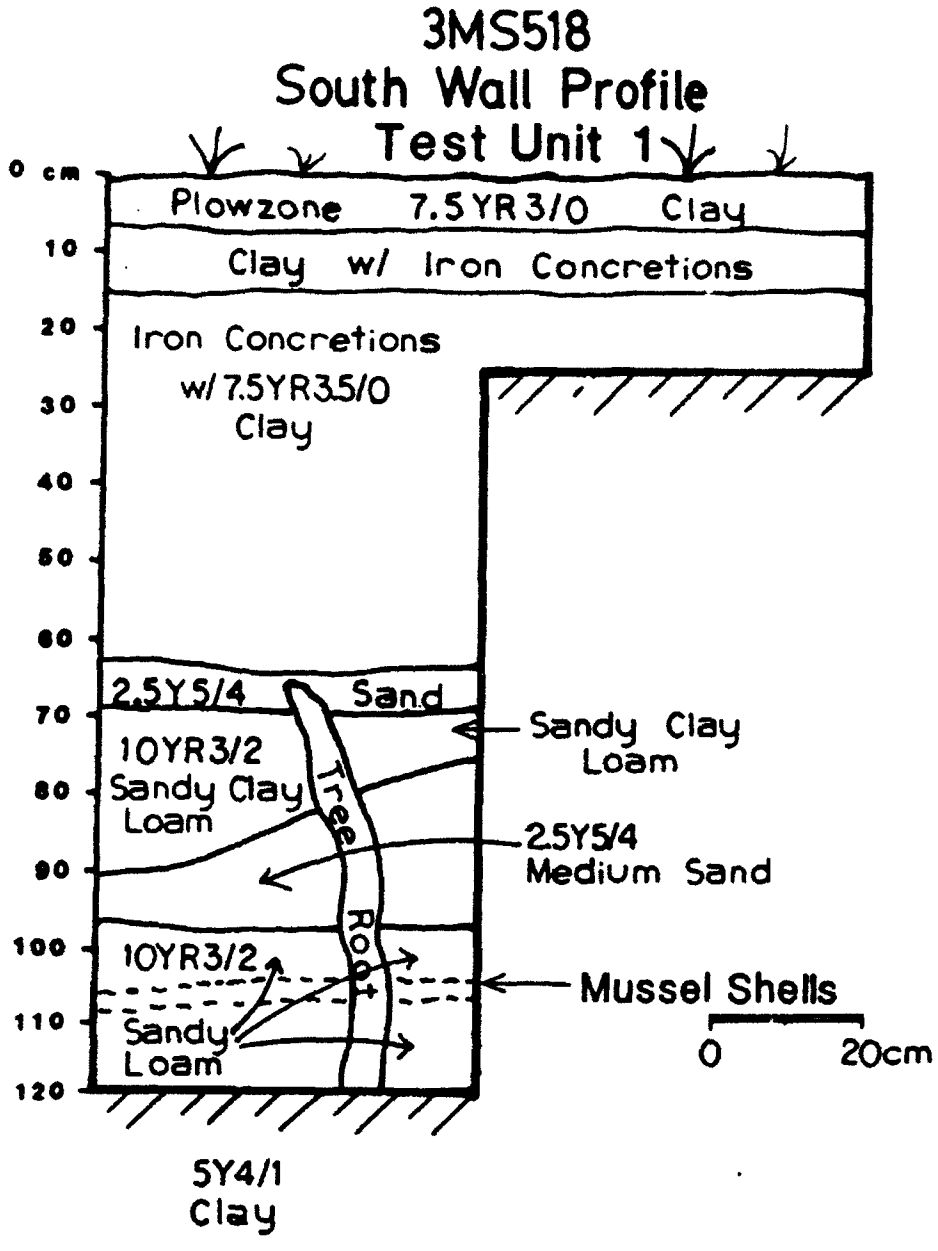


Figure 62. Profile of Test Unit 1, 3MS518.

project and remain untested at this time. Only the surface extent of the site has been mapped and undetected subsurface deposits may be present along the eastern edge of the abandoned channel and outside the present project boundary.

3MS519

Two projectile points (FSN 1 and 2) 15 m apart were found on a distinct north-northeast trending rise which measures 75 m in length. One is a Burkett stemmed type (FSN 1), (Plate 1a) and the other was Marcos-like or untyped corner notched point (FSN 2), (Plate 2a), (Appendix C). These types date from the Late Archaic through the Middle Woodland periods. Although visibility was excellent in the disked field, no additional artifacts were observed. 3MS519 may be a specialized activity site. It lies at the contact of Steele-Tunica and Iberia Soils. The location is situated well outside the project boundaries and was not investigated further.

3MS520

On the way to a transect, a dense concentration of Barnes ceramics and a few lithics were observed in a soybean field. Visibility was poor in the vicinity due to healthy soybeans which had been broadcast. The extent of the artifacts on the surface was not determined. No artifacts were collected. Since the site is outside the project area, it was not investigated further.

3MS521

A multicomponent Woodland and Mississippian site was observed on a low north-northeast trending sandy ridge. The scattering of artifacts, which measured about 70 m x 30 m, contained a high frequency of sand tempered or Barnes sherds, including two conical base sherds. One shell tempered sherd, one base fragment of a projectile point, and one Burlington chert flake were also observed. No artifacts were collected and further investigations were not conducted at the site since it was positioned entirely outside the project area.

3MS522

A low density of artifacts from the Woodland and Mississippian periods was observed in the field just below the spoil of the ditch (Figure 63). The site was planted in soybeans and surface visibility (30-50%) was confined primarily to the area between the rows. The surface of the site was examined upon three occasions; however, few artifacts were observed, mapped, and collected. These are listed in Table 56. One arrowpoint (FSN 1) (Plate 3j) is an untyped lanceolate fragment composed of Crowley's Ridge Chert. A prominent rise is evident north and outside the project boundary where several pieces of burned clay

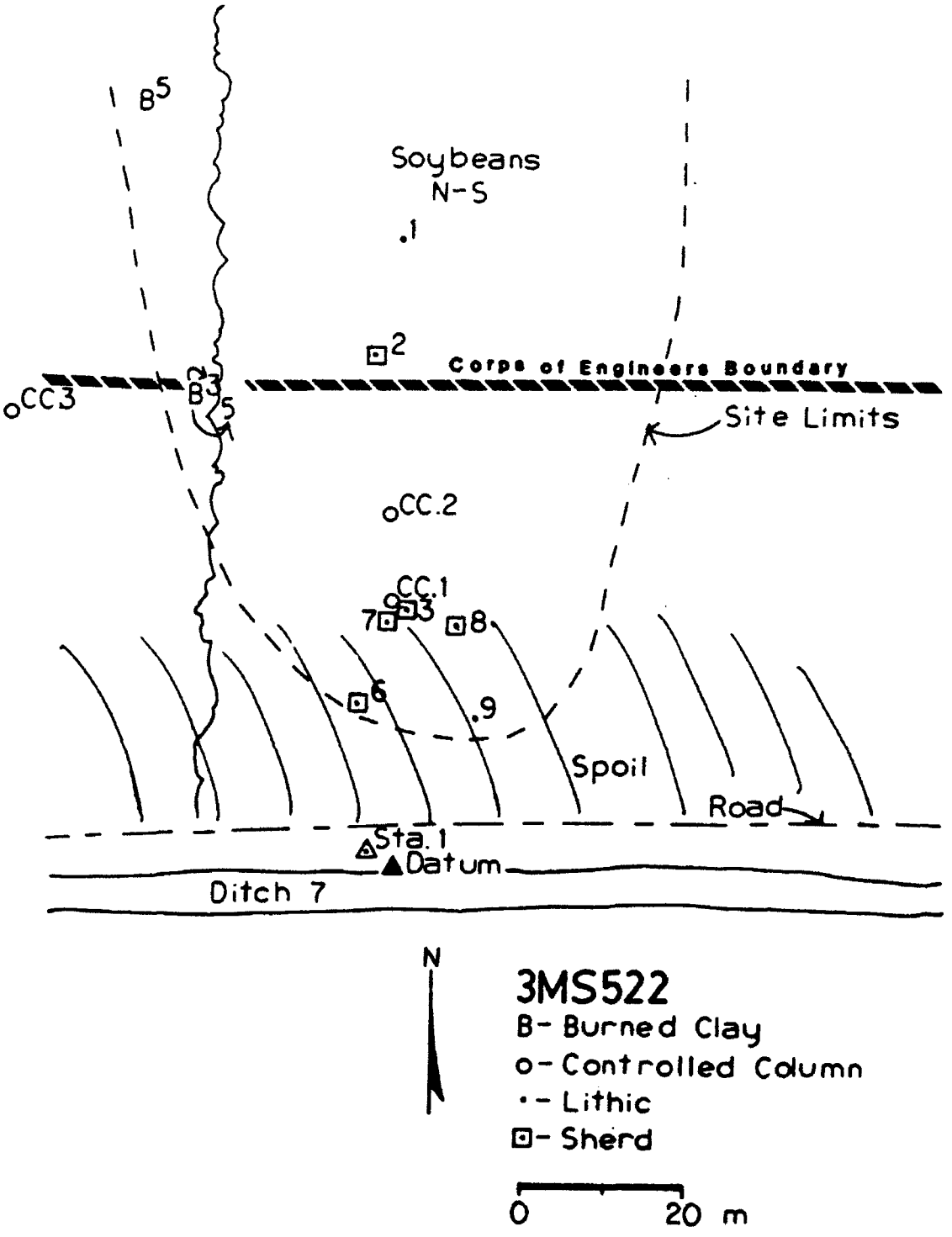


Figure 63. Site Map, 3MS522.

and daub were observed in this vicinity. One fire-cracked rock, one flake, and one sherd were also seen. There is a possibility that the site is buried and outside the project area or that the artifacts have been redeposited from fill.

Table 56. Artifacts Collected at 3MS522.

ABBREVIATIONS USED: Ceramics listed by temper. PL=Plain, FC=Fired Clay, AP=Arrowpoint, SFLK=Secondary Flake, UM=Unmodified Stone.

FSN	LOCATION	SHELL PL	SHELL/ GROG PL	SAND/ SHELL PL	SAND PL	GROG PL	FC	AP	SFLK	UM	TOTAL
1	SURF							1			1
2	SURF	1									1
3	SURF	1									1
4	C1 40-45		1								1
5	SURF			1			12		1		14
6	SURF					1					1
7	SURF	1									1
8	SURF				1						1
9	SURF									1	1
	TOTAL	3	1	1	1	1	12	1	1	1	22

Three controlled columns were excavated at the site. Two of these (1 and 2) were positioned inside the project corridor and the third (3) was located outside. Profiles are shown in (Figure 64). No artifacts or cultural levels were found in Controlled Column 2 and 3. Controlled Column 1, located near the base of the spoil, contained banded sediments characteristic of waterlain deposits; and one small shell and grog tempered sherd was collected from the 40-45 cm level. No additional artifacts were collected and none of the sediments observed were cultural. Due to the low density of material both on the surface and in the controlled columns that portion of the site within the right-of way does not have a high research potential and is not significant. The majority of the site which lies well outside the project boundary needs further subsurface examination in order to determine if intact cultural deposits occur and to collect information on their context.

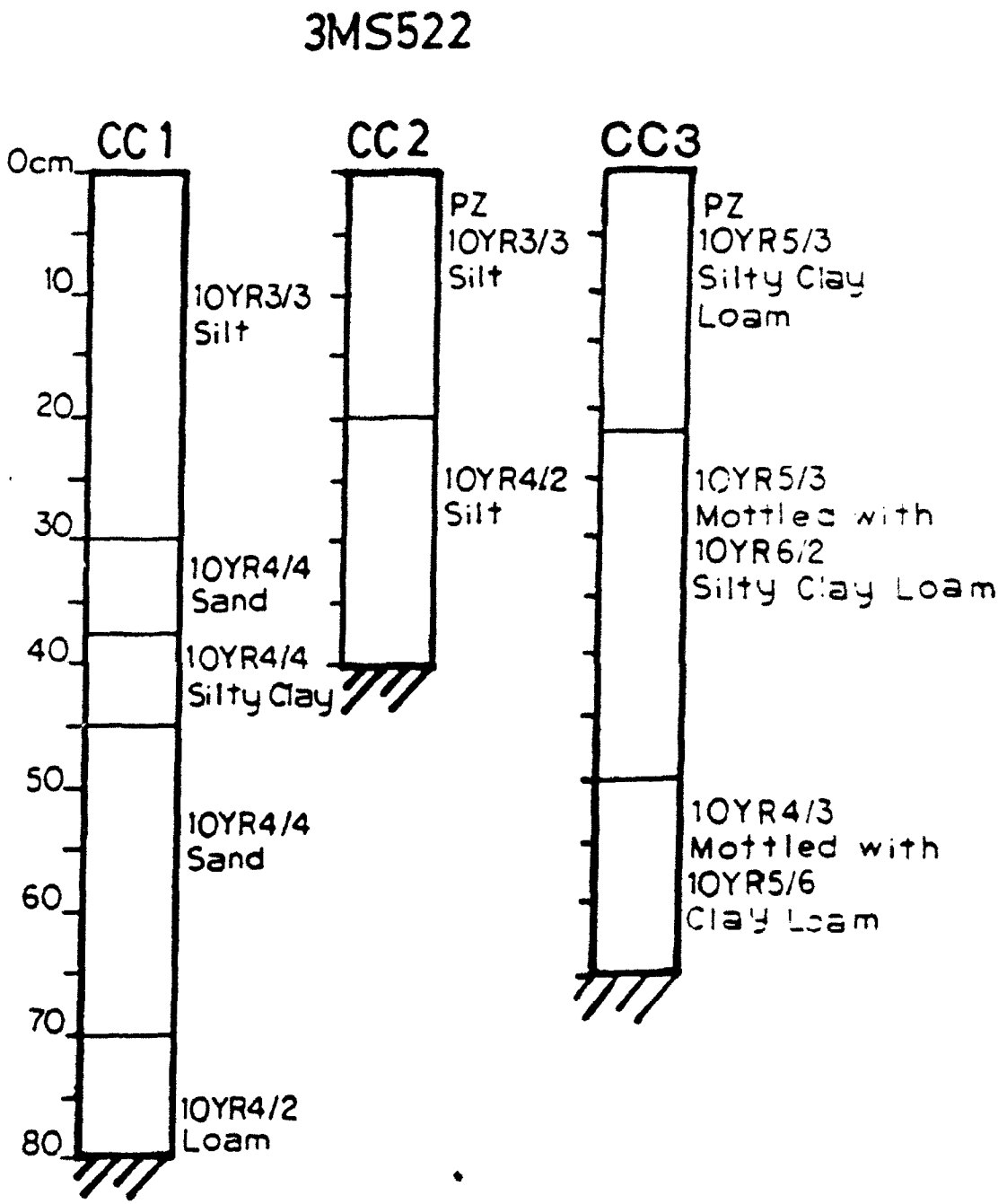


Figure 64. Profiles of Controlled Columns 1, 2 and 3, 3MS522.

Description

3CG918 is a large multicomponent site dating from the Late Woodland to the Mississippian periods. The site covers at least four northeast-southwest trending ridges and measures 100 m NE-SW x 50 m wide (Figure 65). The southernmost tip lies within the project corridor. This portion is only about one-sixth of the site area. Controlled surface collections, one test unit, and one controlled column were positioned at the edge of the corridor. Cultural deposits in this part of the site are limited to the upper plowzone level.

When the site was initially visited the entire corridor had been tilled and plowed affording 100% visibility. The remainder of the site, or the northern portion, was planted in soybeans with an initial visibility of at least 75%. By the time initial testing was conducted, the soybean plants had matured and surface visibility was lessened.

Surface Collections

Fifteen 4 m x 4 m controlled surface collections were conducted in that portion of the site lying within the corridor. The artifacts collected in these units are listed in Tables 57 and 58. The one projectile point (FSN 5-6) (Plate 4d) found in A5 is a shallow side notched arrowpoint. It has apparently been used as a knife since steep retouch occurs along the blade edges. It is composed of a very light gray chert with tiny gray inclusions and may be Burlington chert. The hammerstone is a fragment of a small sandstone cobble which has battering at one end. It was collected in A6.

Table 57. Ceramics Collected in the Controlled Surface Collections at 3CG918.

ABBREVIATIONS USED: Ceramics are listed by tempers. PL=Plain; CDM=Cordmarked; FC=Fired Clay.

LOCATION	SHELL			SAND/SHELL	SAND			SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR		PL	CDM	DEC					
A1	2				7	1				x		10
A2				1	9					x		10
A3				2	11	1				x		14
A4					17	3						20
A5	2				15	2				x		19
A6	3			1	16	4				x		24
B1	3				14	1				x		18
B2	3			3	23	23				x		52
B3	6				39	21				x		66
B4	4				21	25				x		50

LOCATION	SHELL			SAND/SHELL	SAND			SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR		PL	CDM	DEC					
B5	3				16	12				x		31
B6	5				18	13	1			x		37
B7				2	3	5				x		10
B8						2						2
B9					3	3						6
TOTAL	31			9	212	116	1					369

Table 58. Lithics Collected at 3CG918.

ABBREVIATIONS USED: PP=Projectile Point/knife; O=Other tool; PRE=Preform; DR=Drill; UF=Utilized Flake; B=Biface; H=Hammerstone; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; FCR=Fire-cracked rock; UNMOD=Unmodified Cobbles, Stones or Angular Fragments.

	PP	O	PRE	DR	UF	B	H	PFLK	SFLK	IFLK	FCR	UNMOD	TOTAL
Gen Surf											1	1	2
A4											1		1
A5	1												1
A6							1						1
B1										1			1
B3											1		1
B4												1	1
B6									1				1
TU1 0-10				1									1
TOTAL	1			1		1		1		1	3	2	10

Test Unit 1

Test Unit 1 was positioned at the corner of the controlled collection grid and on the edge of the project corridor (Figure 65). Artifacts collected in this unit are listed in Tables 58 and 59, and the profile is shown in Figure 66.

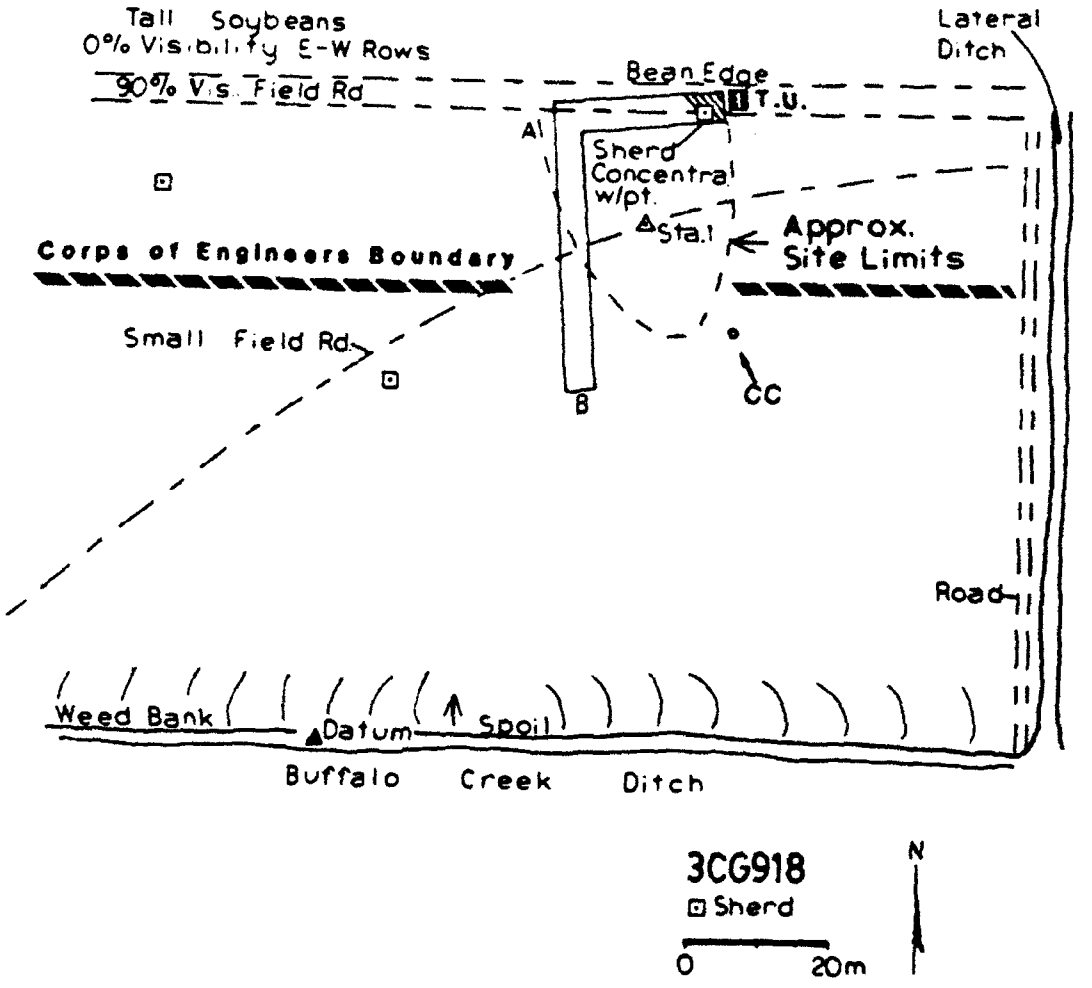


Figure 65. Site Map, 3CG918.

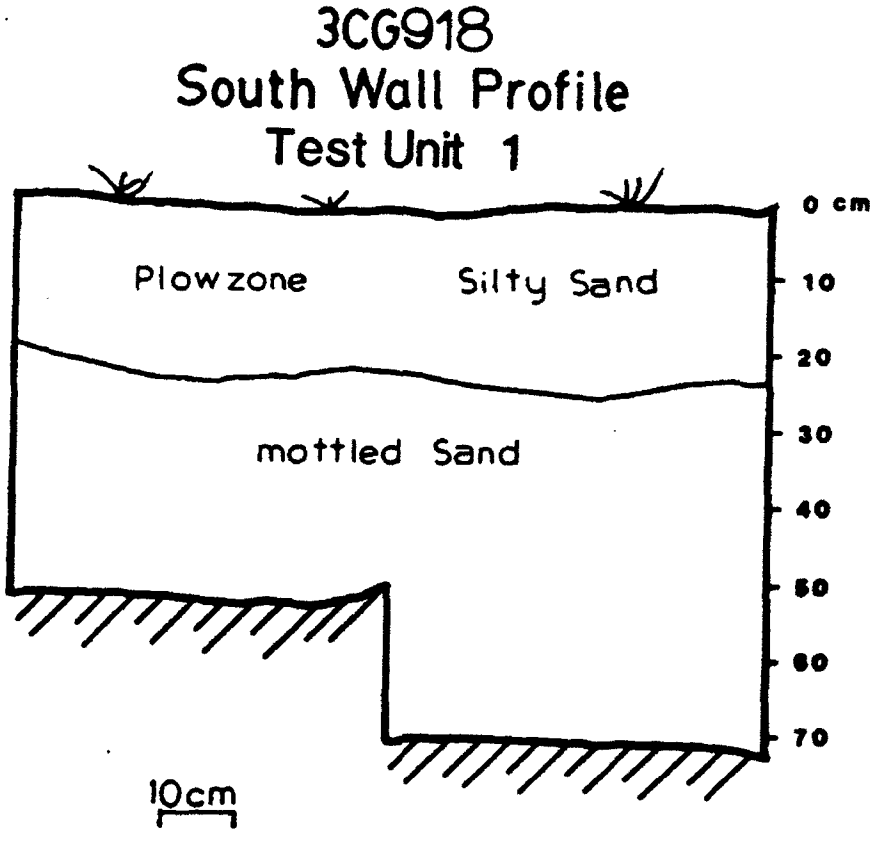


Figure 66. Profiles of Test Unit 1, 3CG918.

Table 59. Ceramics Collected in the General Surface Collections and in Subsurface Units at 3CG918.

ABBREVIATIONS USED: Ceramics are listed by tempers. PL=Plain; CDM=Cordmarked; FC=Fired Clay.

LOCATION	SHELL			SAND/SHELL	SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR		PL	CDM					
surf, grab	1			2	6	6					15
TU1 0-10	5			1	32	9			x		47
TU1 10-20					33	4			x		37
TU1 20-30					13	1			x		14
CC1 0-20	1			4	21	7			x		33
CC1 20-30				2	12	5			x		19
CC1 30-40					1	2					3
TOTAL	7			9	118	34					168

The top three levels of the unit were all plowzone sediments consisting of a homogeneous brown silty sand. From 0-10 cm one small fragment of an arrowpoint which had been retouched as a microdrill was collected (FSN 17-6). At 30 cm below the surface, the entire unit was covered with plowscars which trended north to south. As shown in the Tables 58 and 59 all artifacts were collected from the upper disturbed level.

From 30-40 cm the sediment changed to a mottled gray and brown sand. No feature stains were observed. From 40-50 cm the same color sediment continued and no cultural material was found. The northwest corner of the unit was excavated to 70 cm below the surface. The sands in these lower levels were more mottled toward the bottom of the test pit.

Upon completion of the test unit, the farm manager stopped by and commented that soil had been removed from the spoil and deposited in the field. He also verified that the fields west of 3CG918 had been land leveled.

Controlled Column 1

Controlled Column 1 (Figure 67) was positioned well inside the corridor in order to verify if cultural deposits had been buried by the spoil. This unit was excavated to 75 cm below the surface and the artifacts collected are listed in Table 59. No intact subsurface cultural deposits were found.

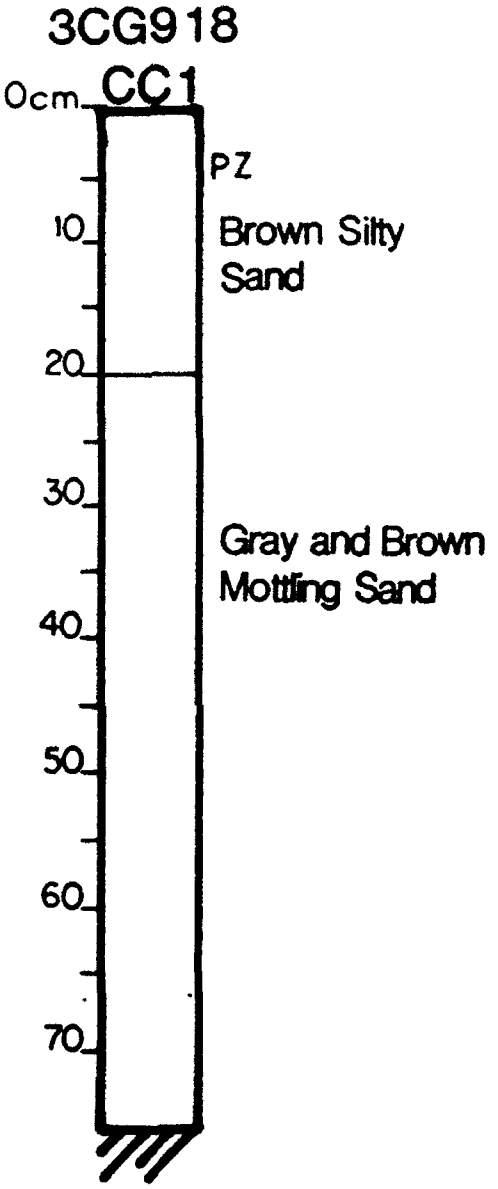


Figure 67. Profile of Controlled Column 1, 3CG918.

HISTORIC SITES AND ARTIFACTS

Introduction

Sixteen historic sites or components, including one standing structure (3MS487), were identified during the project. These are in addition to the late period surface scatters which indicate house sites occupied from the 1930s to the present. Artifacts observed on the surface of these sites were recorded in field notebooks. This information and the site location was given to the project historian to check against historic maps. During the first few days of the project, all historic scatters were recorded until a consensus among the field directors was reached on what constituted a historic site which should be documented on a state site form and what scatters should only be checked against early maps. For this reason, a few of the late period historic sites were recorded and are described. Miscellaneous late period historic artifacts found at sites containing a prehistoric component have usually been listed or described in other sections under the appropriate site description. All sites or components except for 3MS41, 3MS211 and 3MS498 are twentieth century and are not associated with important persons, places, or events. No further work is recommended at these sites in relation to the proposed project.

The historic artifacts from the Buffalo Ditch survey range in age from the early nineteenth to the mid-twentieth century. Three sites are of particular importance, 3MS41, 3MS211, and 3MS498. The artifact assemblage from 3MS41 and 3MS211 contain artifacts which are an indication of 1830-1850 occupations. Pearlware was collected at both sites and stoneware with a hand painted cobalt decoration was found at 3MS41. It is always possible that these artifacts represent heirlooms, but it appears that both these sites have an early component which is potentially important. Site 3MS498 had several artifacts on the surface which date to the 1820 to 1840 time period. Early diagnostic artifacts such as pearlware, a French gun flint, and square iron nails were present in the collections from 3MS498.

Two historic sites are considered eligible for nomination to the National Register and one site is potentially eligible. These include: 3MS41, 3MS211, and 3MS498 all of which contain cultural material ranging from 1820-1850. Further investigations are recommended at these sites. This work should include deed and archival research and, based on the results of this work, possibly additional fieldwork. Sites 3MS41 and 3MS498 also have prehistoric components which are eligible for nomination to the National Register and additional fieldwork is recommended at these sites.

The Hutton Site (3MS41)

Description

This prehistoric site was recorded by R.W. Lyerly, an amateur archeologist, who stated that the prehistoric site may have been disturbed by an old homestead which had been located on the site. During our investigations, 100 controlled surface collections were made and about half of the 4,000 artifacts collected were historic. A summary table of the material collected in the controlled surface collections is presented in Table 60 and the distribution of historic artifacts is shown in Figure 68.

Table 60. Historic Artifacts Collected in Controlled Surface Collections at 3MS41.

COUNT	ITEM
6	Square nails
117	Miscellaneous fragments of metal
4	Clear window glass
13	Green window glass
461	Clear glass, includes fragments of bottles and pieces with designs
245	Brown glass, green glass, blue glass; includes bottle necks, cobalt and many light blue
1	Light pink with yellow underneath
20	Milk glass
60	Pressed glass
4	Clear glass with printing
2	Frosted glass
1	Carnival glass
1	Red tail light reflector
67	Whiteware
1	Transferware, white/green,brown
1	Transferware, flower decal (1930)
7	Crockery, Light grey
35	Stoneware; includes some gray salt glaze, tan salt glaze, Albany, tan with cobalt decoration, Dark brown, red brown unglazed
4	Porcelain
3	Handpainted, white floral, brown floral and green
6	Miscellaneous glass which includes yellow Fiesta, green glaze, yellow with blue base
1	Impressed pearlware sherd
2	Electrical insulators, glass
1	Electrical insulators, porcelain
148	Brick fragments
652	Vitrified fragments
37	Slate fragments

6	Limestone fragments
43	Pebbles
20	Cement fragments
1	Seed pod
1	Bone fragment
1	Animal tooth
1	Rubber heel
1	Jewelry

The greatest numbers of historic artifacts (almost 1,000) were glass and ceramics (Table 60). This count includes window glass, various colored glass, whiteware, and refined earthenwares. A few diagnostic historic artifacts, including pearlware and stoneware with hand painted cobalt decorations, are an indication of a circa 1830-1850 occupation at 3MS41. It is possible that these artifacts were heirlooms, but it also appears that the site may have been occupied early and then successively for a long period of time. This historic component needs additional investigation to include deed and records research.

Cinders and other vitrified materials made up the second largest group of historic artifacts (about 650). These could have been residue from stoves or remnants of a burned structure. Their distribution coincided with the highest density of historic glass and ceramic artifacts in the portion of Controlled Collection Row C just west of Row B (Figure 68). This high density probably reflects the approximate location of one historic house once located on the site.

Other historic artifacts include about 150 brick fragments and 125 fragments of metal. The highest density of brick fragments was slightly west of the highest densities of glass, ceramics, metal, and vitrified materials. The metal artifacts, besides unidentified fragments, included ammunition, two pocket knives, a pipe wrench, and some modern farm implements.

3MS211

Description

Two visits were made to 3MS211. On the first visit a light historic scatter was observed in a milo field. This area lay on the eastern edge of a General Land Office Survey Plot which was mapped by B. F. Owen in December of 1846 in which a field and "possible house" was drawn. This plot was assigned the State Site Number 3MS211. The surface visibility at the initial visit was about 50%. When we returned to conduct controlled collections at the site in July, surface visibility was greatly reduced in addition to the landowner discouraging any further work until his mature crop could be harvested. For this reason, we revisited the site in February, 1987, and conducted controlled surface collections. At this time 3MS211 was covered in winter wheat, and surface visibility was about 80%.

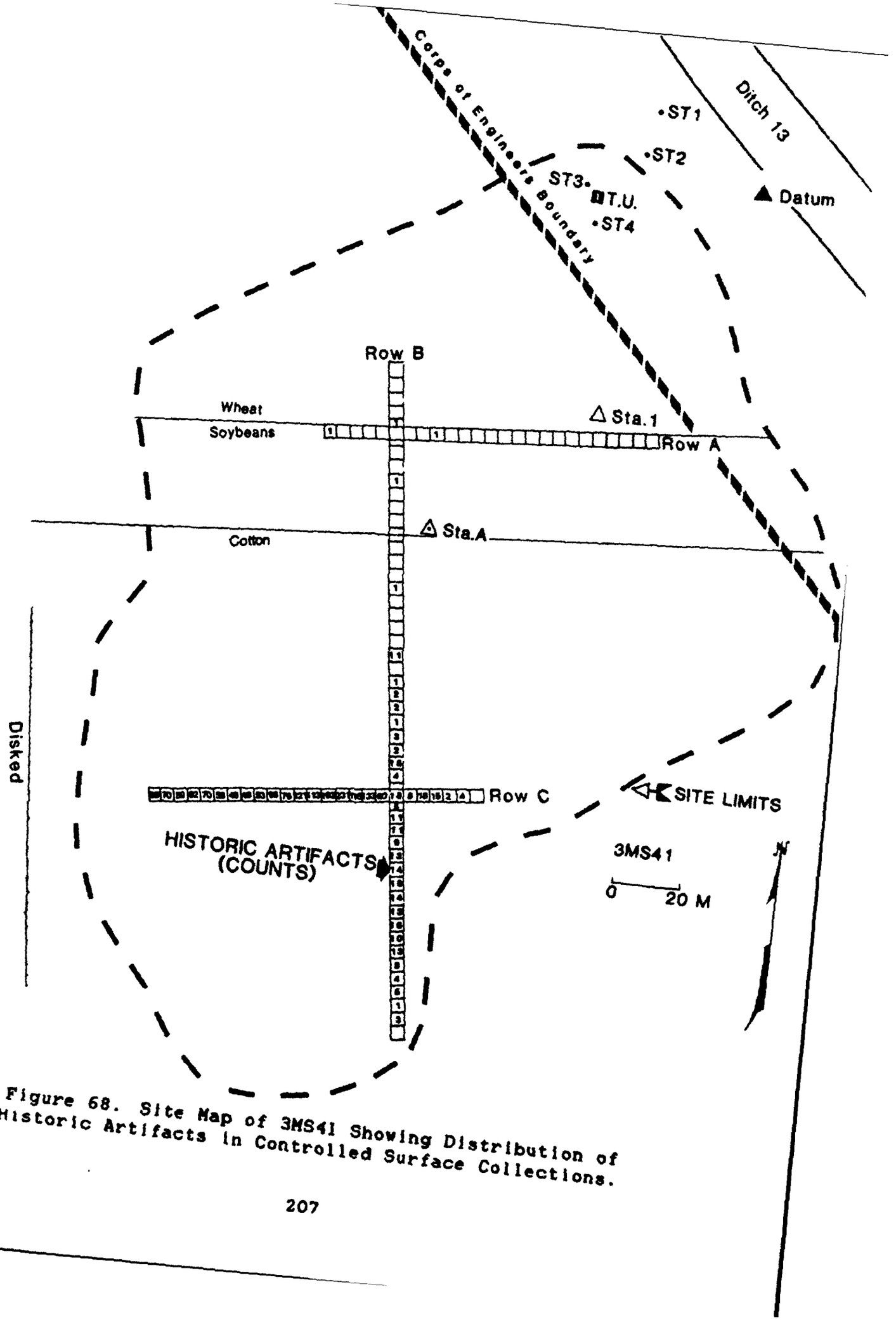


Figure 68. Site Map of 3MS41 Showing Distribution of Historic Artifacts in Controlled Surface Collections.

Surface Material

On the initial visit to the site the following artifacts were observed, but not collected: whiteware, purple glass, green glass, brown bottle glass, miscellaneous metal, and porcelain. Three artifacts were collected at that time. One has an underglazed hand painted floral motir design which is typical of early nineteenth century tea wares. This sherd could date to the 1840s or later. Two other earthenware bases with partial maker's marks were found. One is marked "M..." and is semi-porcelain. The other transfer printed aqua color mark has a crown. These could be either English or American in manufacture, as many American companies used English motifs in their marks.

In February, 1987, 20 4 m x 4 m controlled surface collection units were mapped and collected. The distribution of material is shown in Figure 69. The artifacts collected in the controlled surface collections are listed in Table E3 and a summary table is presented in Table 61. The individually mapped specimens shown in Figure 69 are described in Table 62.

Table 61. Summary Table of Historic Artifacts Collected at 3MS211.

COUNT	ITEM
25	Miscellaneous metal items
1	Clear window glass
7	Green window glass
24	Clear glass, other
45	Brown glass, green glass, blue glass, purple glass
23	Whiteware, two with green floral
11	Stoneware, includes some Bristol and Albany
1	Porcelain
1	Pearlware
1	Miscellaneous black glazed sherd
1	Electrical insulator, glass
3	Sandstones
2	Concretions
8	Vitrified material
2	Rubber, plastic

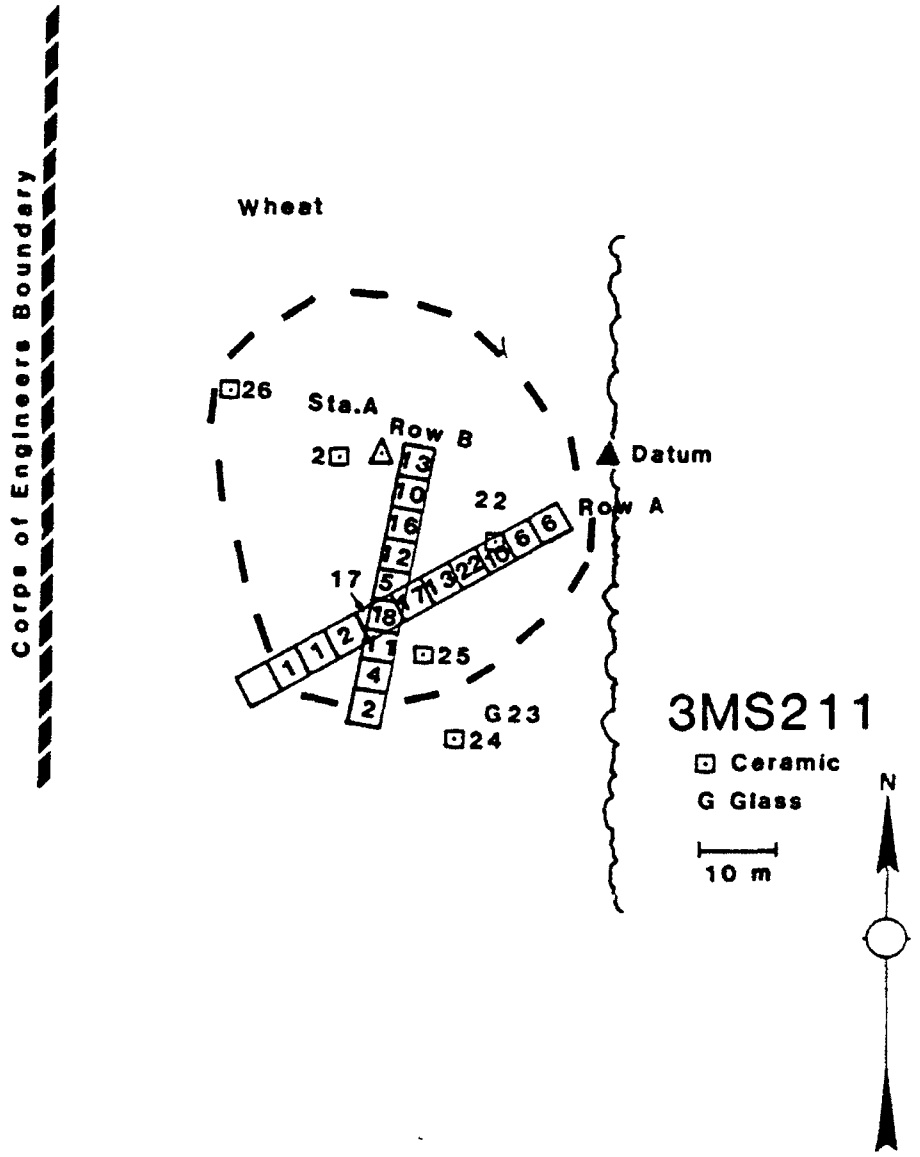


Figure 69. Site Map, 3MS211.

Table 62. Mapped Artifacts Collected at 3MS211.

FSN	ITEM
1	1 transferware printed marked base aqua color, crown mark
2	1 whiteware base sherd - M --semi-porcelain
22	1 whiteware with pink and green "decal" floral design
23	1 impressed milk glass vase
24	1 whiteware with pink-green "decal" floral design
25	1 transferware-pearlware cup base, brown leaf transfer
26	1 whiteware pink and green "decal" motif
	1 green edge rim

Archival Documentation

As stated, the field and "housesite" are plotted on the 1846 GLO. In addition, there are enough artifacts such as the pearlware which indicate an 1830-1850 occupation that the site is potentially eligible to the National Register and warrants further investigation. It is possible that these artifacts are heirlooms. Additional archival and informant research is recommended and based on the results more fieldwork may be necessary to determine significance.

3MS487

3MS487 is a rock-walled house adjacent to Ditch 7. The walls are composed of chert and limestone, and the roof is shingled with automobile license plates. The license plates are continuous series of Oklahoma plates dated 1934 and 1935. This house is one of at least six within a half mile that are similarly constructed. Although the roof of the house is collapsing, details of construction remain intact.

Of the other similar houses in the vicinity, two are currently used as residences, one is a cabinet shop, and two are abandoned. Four have remnant patches of license plates on the roof, although most of the roof area has been replaced by more conventional materials.

Local landowners were not familiar with the origin of the houses and no knowledgeable informant could be found. However, the floor plan of the house was recorded and construction details were documented with photographs. One stoneware sherd was collected near the house.

This house and the similar houses nearby appear to be part of a distinct community created in the 1930s and may be significant in terms of local history and architecture. 3MS487 is the only one of the houses near enough to Ditch 7 to be impacted by the proposed project. It is also one of the few

which retains its original roofing materials. Two other houses, also near Ditch 7, currently serve as residences, one for the landowner and one for a tenant. These latter two houses are at the edge of the project impact zone and could be avoided by dredging equipment.

The only historic artifact from 3MS487 is a medium blue exterior glazed stoneware sherd with a pale gray glazed interior (FSN 1-1). Stoneware with these colors is common on early twentieth century sites. Forms such as pitchers, salt crocks, butter crocks, and mixing bowls are representative. Such objects are illustrated in the 1908 Sears, Roebuck catalog.

Although 3MS487 is collapsing and is currently being used as storage for empty farm chemical containers, the house and the community of similar houses are unique in Mississippi County. Additional archival or informant based research is necessary to determine their origin and function. SPEARS has documented the house with a floor plan sketch and photographs (color and black/white). The house by itself is not significant, but as a member of a group of structures, it may be important. If possible, it should be avoided during channel improvement.

3MS488

Description

A light scattering of historic artifacts were observed on both sides of a gravel county road and within a plowed field. Site size was estimated as 100 E-W m x 50 m N-S. The artifact assemblage indicated that this was the location of a twentieth century house.

Surface Observations

The following artifacts were observed on the surface of the site: milk glass, pressed glass, whiteware, cobalt blue glass, clear glass, purple glass, crockery, stoneware with a blue line, and a mother of pearl fragment. No artifacts were collected at this site.

Archival/Informant Documentation

The 1941 Manila quadrangle shows a structure in this location. The land operator, Robert Hamilton (personal communication with Carol S. Spears 7-24-86), does not remember a structure in this location, although he recalls four houses located 1/2 mile north of the ditch which were removed about 20 years ago. Only a couple of houses remain in this area today.

3MS489

Description

3MS489 consists of a light and heavy scattering of historic debris beneath five large trees (two Cypress, two Pecan and one unidentified). The main house was located on a low rise between

two of the trees. One barn and three small outbuildings remain at the east end of the site, and two of these are in use today as a horse stall and storage shed. Site size is estimated as 350 m E-W x 60 m N-S. The site functioned as a twentieth century farm complex with portions still in use.

Surface Observations

Artifacts observed, but not collected, consisted of: cut nails, bricks, whiteware, clear glass, pale green glass, brown bottle glass, pressed glass, crockery, milk glass, windshield glass, miscellaneous metal, a purple glass bottle fragment, and chunks of concrete. Inside one older horse stall was an old metal buggy frame with spoked wheels and an aluminum tea kettle. One small storage shed was built on skids and had a new aluminum roof. The barn was of board and batten construction with a tin roof. Nails were round and cut or machine made. Four horses shared the other horsestall.

Archival Documentation

Two structures are located on the 1941 Manila quadrangle.

3MS490

During SPEARS initial survey of Ditch 13, a glass bottle fragment was found in a recently plowed field at the edge of the project corridor. The light blue bottle fragment (FSN 1-3) and everything within a two meter radius of it was collected. These artifacts included: one purple glass, three pieces of clear glass, one whiteware, and one brick fragment. Because visibility was poor in the recently plowed field, no systematic controlled collections were conducted. One additional Bristol slip stoneware sherd with a partial stenciled maker's mark (FSN 2-1) was collected to aid in dating the occupation. All of the artifacts collected could date to the early to mid-twentieth century.

The landowner informed SPEARS that a school had once been located at this site. He also provided the name of a local informant who would have some knowledge of the site. Repeated efforts to contact the informant were unsuccessful. A structure is present on the 1941 Manila quad map, but it is not identified as a school.

The artifacts collected were all at the south edge of the impact zone of the proposed channel improvements and at the north edge of the site. The artifact distribution is almost entirely outside the impact zone and the site is separated from Ditch 13 by an old filled channel of the natural stream course.

3MS490 is probably twentieth century in date. Other artifacts include: one undiagnostic whiteware, one brick, one unseamed twentieth century light blue bottle neck, three clear glass and one purple glass sherd.

Although little data was gathered, the site does not appear to be significant in terms of National Register criteria. The proposed channel improvements should have no impact on the site, because the major portion of the site lies outside the project right-of-way.

3MS491

Description

3MS491 consists of a scattering of historic artifacts and a cinderblock foundation located on the west side of Buffalo Creek Ditch and just off the spoil. The material is distributed around the house foundation remains for about 50 m. Surface visibility in the field was good since the area had been tilled and sparse weeds covered the surface.

Surface Observations

Artifacts observed but not collected included: two willowware sherds, whiteware, green transfer, ironstone, milk glass, glass door knobs, cut nails, crockery, and green milk glass.

Archival Documentation

One structure is plotted in this location on the 1941 Leachville quad. The site appears to date to the middle twentieth century and probably functioned as a tenant house.

3MS495

Description

3MS495 is a historic and prehistoric site that has been described in the previous section on redeposited and plowzone sites. A light scattering of historic artifacts was observed in a small area between the levee and the ditch. One structure is shown in this location on the 1941 Manila quadrangle map.

The objects from 3MS495 all appear to be twentieth century in date. The six embossed medium blue plate sherds are of a form and color most popular in the 1930s. The two stoneware sherds are glazed with Bristol slip, which was used in the very late nineteenth and early twentieth centuries. Bristol slip stoneware was developed in Bristol, England (Greer 1981:210). It is prepared from chemicals and leaves a smooth, pale gray to white glaze. After the New Orleans exposition of 1884, most commercial potters used this glaze in North America. The dark brown Albany slip was often used in combination on the interior of vessels.

The glass included a bottle base marked "Duraglass" and one painted clear glass bottle which once held a soft drink. The letters "OW" and "N" on the glass were part of a brand name. The cobalt blue glass bottle was probably a medicine bottle. The Lincoln penny also indicated a mid-twentieth century date.

One controlled column was excavated at the site and the only artifacts collected were historic materials found in the plowzone (0-20 cm). These artifacts are listed in Table 63.

Table 63. Historic Artifacts Collected in Controlled Column 1 at 3MS495.

COUNT	ITEM
27	Miscellaneous metal fragments
25	Clear glass (1 very thin)
5	Colored glass, brown, blue
1	Milk glass jar lid
1	Stoneware, blue glaze
3	Plastic fragments
2	Pebbles
7	Brick fragments
32	Burned vitrified chunks

3MS498

Description

3MS498 is a historic and prehistoric site which has been described in an earlier section of this report. In addition one structure is located in this area on the 1941 Manila quadrangle. A total of 116 controlled surface collections were made at this site. The historic artifacts were thinly scattered and the distribution of the historic material is shown in Figure 70. A summary table of historic material is presented in Table 64.

Table 64. Summary of Historic Artifacts Collected at 3MS498.

COUNT	ITEM
6	Square nails
20	Miscellaneous metal pieces
1	Clear window glass
13	Other clear glass
21	Miscellaneous colored glass, green, brown, blue, purple
54	Whiteware
5	Transferware which includes blue floral, purple print, pearlware, black, dark blue
3	Crockery, gray salt glaze
21	Stoneware, salt glaze grey, Albany glaze
2	Porcelain
17	Miscellaneous glass items which include: handpainted pearlware, Redware, fired clay, pearlware, earthenware, terra cotta
1	French gunflint
1	Stoneware pipe bowl
2	Brick
1	Vitrified material
1	Slag fragment

A considerable number of earthenware sherds from 3MS498 can be classified as pearlware. The characteristic blue-white glaze of pearlware was invented by Josiah Wedgwood in 1779 (Hume 1973:232) as a closer imitation of the the color of Chinese porcelain. Pearlware was extremely popular for over 50 years. The small amount of cobalt included in the glaze is obvious in areas where the glaze gathers, particularly on foot rims and around handles. Many of the sherds identified as whiteware at 3MS498 are probably also pearlware, but cannot be definitely called so because no area where the glaze could gather was present. Pearlware was manufactured by hundreds of different British manufacturers and was exported throughout the British empire. New Orleans was probably the principal port of entry for British goods found in Arkansas. Pearlware has been excavated at such locations as Arkansas Post (Martin 1977), Davidsonville (Stewart-Abernathy 1980), and the Zebree site (P. Morse 1980a).

One sherd at 3MS498 in unit D22 can be identified as blue shelledge pearlware (FSN 112-8). This is a broken embossed rim sherd with a trace of blue paint by the break. Blue shelledge is the most common type of decoration on pearlware found in the southeast United States on pre-Civil War sites.

Two different hand painted underglaze sherds were found which are probably pearlware. One sherd at locus 109W, 44N has a fine red, green, and black floral design (FSN 4-6). Another sherd, from unit D24, has green and black paint (FSN 114-6). These probably came from the same set of dishes and were parts of a tea service.

Transfer printing on pearlware became extremely popular in the 1820s. A variety of different transfer printed vessels are present at 3MS498. Different colors and motifs are present including: purple, light and medium blue, dark blue, and black. These can be definitely called pearlware when the foot ring is present and the characteristic blue glaze gather can be observed. No pattern can be definitely identified from the small sherds present.

A blue sponged pearlware, handled sherd was found in unit D 15 (FSN 105-8). It was probably from a small cream pitcher. The handle has been broken off, but the blue glaze gather is obvious around the break.

One flow blue base (FSN 97-3) was found in unit D7. Flow blue was made in England from 1830 to 1900, but its major time of popularity was in the 1870s and 1880s (Williams 1971). Ironstone was printed with cobalt designs which flowed outward from the design out on to the white surface, giving a smeared look. At times the flow blue designs were highlighted with gilding. Ironstone china itself was patented by Turner in 1800, with Spade patenting "stone china" in 1805 and Mason developing "Iron Stone China" in 1813 (Godden 1965:xxiii). Ironstone slowly began to replace pearlware in popularity.

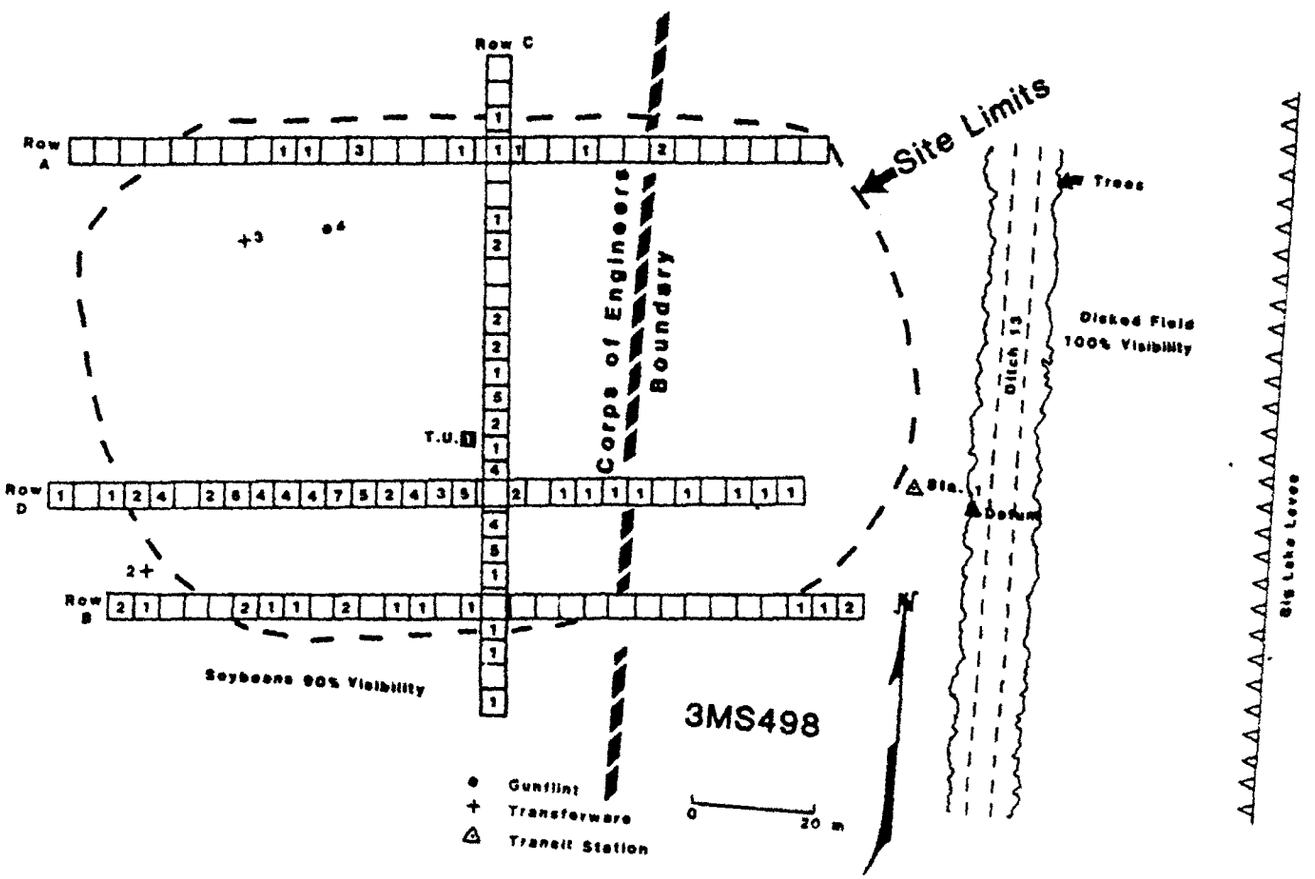


Figure 70. Site Map of 3MS498 Showing Distribution of Historic Artifacts in Controlled Surface Collections.

Two sherds from two different stoneware pipes were present, one in unit D18 and one in Test Unit 1 in the 20 to 30 cm zone. One sherd is a dark gray rim sherd with a simple exterior collar on the rim (FSN 108-11). The other, a red-brown colored sherd, is a broken bowl fragment showing where the bowl and handle join (FSN108-12). These short-handled pipes were made to be smoked with a reed stem. Clay pipes have been manufactured in the United States since 1740 and were being made as recently as 1953 (Hamilton and Hamilton 1972). As more research is done visiting actual pottery kiln sites, such as that done by Smith and Rogers (1979), it is becoming evident that most local potters made these molded pipes on occasion. At least thirty potters in Tennessee manufactured stoneware pipes. The two found at 3MS498 cannot be attributed to any specific manufacturer.

American utilitarian stoneware was derived from northern European antecedents (Greer 1981:14). In particular, the Rhenish area provided immigrants to America in the eighteenth century who were trained potters. Stoneware must be fired at a temperature between 1200 and 1300 degrees C to become properly vitrified (Greer 1981:15). Earthenwares are fired below this temperature. Stoneware is durable, leakproof and acid resistant and was used for many household functions, particularly food storage.

Salt glazing of stoneware was invented in the Rhineland in the fifteenth century, and this manufacturing technique soon spread to England. The potters who immigrated to America brought this technique with them. A potter needed a clay source, water, and wood to set up shop. Numerous small pottery industries grew up in the nineteenth century in the United States. Using both archival research and field survey, Smith and Rogers (1979) recorded 163 distinct potteries in Tennessee. Over 100 kiln sites were located in two years of research. No similar survey has been accomplished in Arkansas. Most of the Tennessee potters used salt glaze, but two in West Tennessee used alkaline glaze (Smith and Rogers 1979:25).

The pottery sherds found at 3MS498 were all salt glazed. A variety of vessels were present ranging in color from gray to brown. One flat base is present, as well as two rims with simple incised line decorations. No impressed maker's marks or numbers were present on the sherds. No cobalt blue decoration was present. No alkaline glaze sherds were present. The vessels appear to have relatively straight sides, more characteristic of the mid-nineteenth century. They are probably all sherds of simple storage jars or churns. One tan salt glazed handle from unit C17 is probably from a churn (FSN 82-6).

A majority of the sherds from 3MS498 have no glaze on the interior. Stoneware with unglazed interiors do not store liquids as well as those which are slipped. The vessels from units A19 (FSN 24-4), C11 (FSN 76-5), C15 (FSN 80-5), C19 (FSN 84-3), D18 (FSN 108-10), D19 (FSN 109-8), D21 (FSN 111-10), D26 (FSN 116-9), and D27 (117-5) may have functioned as storage jars for foodstuffs other than liquids.

Several stoneware sherds from 3MS498 are glazed with Albany slip on the interior. Albany slip is prepared from clay found near Albany, New York (Greer 1981:194). It is a deep brown color. This clay was discovered during the first quarter of the nineteenth century. It melted readily and covered the surfaces of vessels creating a tight seal. Albany type glazes were used by potters throughout the United States, particularly to glaze interiors. The presence of Albany slipped vessels at 3MS498 indicates a purchase from a commercial pottery, rather than a simple, marginal, one family rural operation.

Two stoneware sherds from 3MS498 can actually be classified as redware. Redware is not fired as highly as true stoneware, and is generally dated to the eighteenth and early nineteenth century. The two sherds from unit B25 (FSN 60-5) appear to be true redware, with a red-brown lead glaze.

The gun flint from 3MS498 has been identified as French because of the typical honey-colored hue of the specimen. Both military and trade French gun flints were of this color (DeLotbiniere 1980:157). English gun flints are usually black or gray-brown. The chert from which the gun flint at 3MS498 was made is not like any which is locally available.

Four similar French gun flints were found at the Cox site, 3RA58. Two 1848 dated Davenport saucers and a large 1837 penny date the Cox site to the late 1840s. Flintlocks ceased to be commonly used by the time of the Civil War, and most were converted for modern use.

None of the glass from 3MS498 is particularly diagnostic of any time period. No pontil marks were present. Two broken necks with a single seam showing with applied lips are present, indicative of nineteenth century glass blowing techniques. Only clear, light blue, and amber glass is present in the collection. Clear and light blue glass is usually indicative of medicine bottles (Hume 1970:74-75). Amber glass often contained either beer or snuff. One clear glass sherd with a lattice work pattern from unit B1 is probably from an early twentieth century coffee jar, such as Old Judge coffee. No flat window glass was identified.

Metal fragments from 3MS498 include an iron hook, a portion of a flat iron sheet which could be from a stove, and a large spike. Test Unit 1 produced six square headed nails at the 20 to 30 cm level. These appear to be shaped like the common nail of the 1840 to present time period (Nelson 1968). Heavy rust prevented further interpretation of these specimens.

3MS502

Description

3MS502 is a historic and prehistoric site which has been discussed in a previous section. Historic artifacts collected at this site were twentieth century and a summary listing is provided in Table 65. A structure was not observed on the 1941 Manila quadrangle in this location.

Table 65. Summary of Historic Artifacts Collected at 3MS502.

COUNT	ITEM
5	Miscellaneous metal items
1	Clear window glass
15	Other clear glass
12	Colored glass, green, brown, blue and purple
1	Pressed glass
15	Whiteware
9	Crockery
1	Pipe bowl fragment
1	Brick
1	Celluloid fragment
1	Rubber fragment
1	Screwdriver

3MS503

Description

3MS503 is a historic component near the prehistoric site which has been described and mapped (Figure 18) in a previous section. The artifacts collected included three pieces of blue glass, one piece of purple glass, one whiteware sherd, and one light blue transferprint. The historic scatter is located outside the project corridor and was not investigated further.

3MS504

Description

3MS504 is a prehistoric and historic site which has been described in a previous section. Controlled collections were conducted at the site and a listing of the historic artifacts collected is presented in Table 66. All of this material dates to the twentieth century.

Table 66. Summary of Historic Artifacts Collected at 3MS504.

COUNT	ITEM
5	Round nails
24	Miscellaneous metal fragments
169	Clear glass, some bottle necks
25	Colored glass, green, brown, blue, purple
12	Milk glass
3	Pressed glass
1	Glass with "Paragould, Ar"
17	Whiteware, 1 with impressed floral design
1	Transferware, blue
1	Porcelain
1	Impressed green earthenware
2	Bone fragments

3MS517

Description

3MS517 is a historic and prehistoric site which has been described in a previous section. The historic artifacts listed in Table 67 date to the twentieth century. Two structures were located in this vicinity on the 1941 Manila quadrangle.

Table 67. Summary of Historic Artifacts Collected at 3MS517.

COUNT	ITEM
6	Miscellaneous metal items
3	Clear window glass
24	Clear glass (other)
5	Colored glass, green, brown, blue
2	Miscellaneous glass, opaque, yellow
5	Whiteware
6	Fired clay
7	Brick fragments

The artifacts from 3MS517 also appear to all be from the twentieth century. The fired clay is probably broken brick. The clear glass sherds and light blue glass may be from medicine bottles, canning jars, and windows. The yellow glass is probably from a decorative object such a vase. The opaque white glass

could be a cosmetic container. The brown glass is probably a beverage container. The two whiteware sherds are probably twentieth century.

Site 2

Description

Site 2 consists of a light scatter of historic artifacts which covers an area about 100 m E-W x 50 m N-S and lies within a cotton field. The material indicates a twentieth century housesite or dump.

Surface Observations

The following artifacts were observed on the surface of the site: crockery, whiteware, brown bottle glass, pressed glass, pale purple glass, window glass, cobalt blue glass, and a porcelain plate base.

Archival Documentation

No structures were observed on the 1941 Manila quadrangle map. The land operator, Robert Hamilton (personal communication with Carol S. Spears 7-24-87), does not recall a structure in this location, although he remembers when four houses were torn down which were located only 1/2 mile north and parallel to the ditch. Only a couple of houses remain along this road today. One farm complex is directly north of this scatter and it is possible that these artifacts may be a recent trash dump related to this farm. Site 2 was not assigned a permanent state site number.

Site 15

A historic scatter measuring about 50 m in diameter was located at the base of the spoil. Artifacts observed, but not collected, included: electrical insulators, whiteware, canning jar fragments, clear glass, pressed milk glass, one blue mixing bowl sherd, and miscellaneous iron. A structure is not shown on the 1941 Manila quadrangle map, therefore, this site probably dates between 1941 and 1956. It was not given a permanent site number.

Site 16

A relatively light scatter of historic artifacts was found to extend 100 m x 50 m in a cultivated field. Material observed, but not collected, consisted of: whiteware, crockery, green milk glass, miscellaneous metal, mason jar fragments, a leather shoe sole, and milk glass. A structure is not shown in this location on the 1941 Manila quadrangle map, therefore, the site is interpreted as a recent trash dump. It was not given a permanent site number.

Chapter 8

SEDIMENTOLOGICAL CHARACTERISTICS AND ORIGIN OF FLUVIAL SEDIMENTS, AND ENVIRONMENTAL HISTORY OF STUDY AREA

by

John C. Dixon

METHODS

Geomorphic Mapping

The geomorphic map of the study area (Figure 71) was developed from existing geologic maps, field observations, laboratory analysis of surface deposits, and Soil Conservation Service soil surveys. The initial mapping was based on the maps generated by the Geologic Investigation of the St. Francis Basin. These maps were then modified from the analysis and interpretation of grain size data generated by the sedimentological analysis of sediments collected at archeological test sites and from backhoe trenches dug at two locations within the study area. The geomorphic map is computer reduced from a small scale map and therefore possesses considerable distortion. This map is accurate with respect to the distribution of surface sediments.

Grain Size analysis

Samples from selected archeological sites and backhoe trenches in the study area were collected for sedimentological analysis. These samples were analyzed by the University of Arkansas Textural Laboratory. Approximately 30 grams of air dried sample from each unit sampled were desegregated, dried, and weighed to determine initial sample weight. Each sample was then agitated in a blender for five minutes to obtain complete particle suspension. The suspended sample was then agitated through a 230 mesh screen with distilled water and the sand fraction (0.06-2.00mm) removed. This fraction was later dry sieved and the relative amounts of very coarse, coarse, medium, fine, and very fine sand determined. The silt and clay size fractions (<0.06mm) were transferred to a 1000 ml cylinder, with 25 ml of Calgon in the 1000 ml of distilled water. Each sample

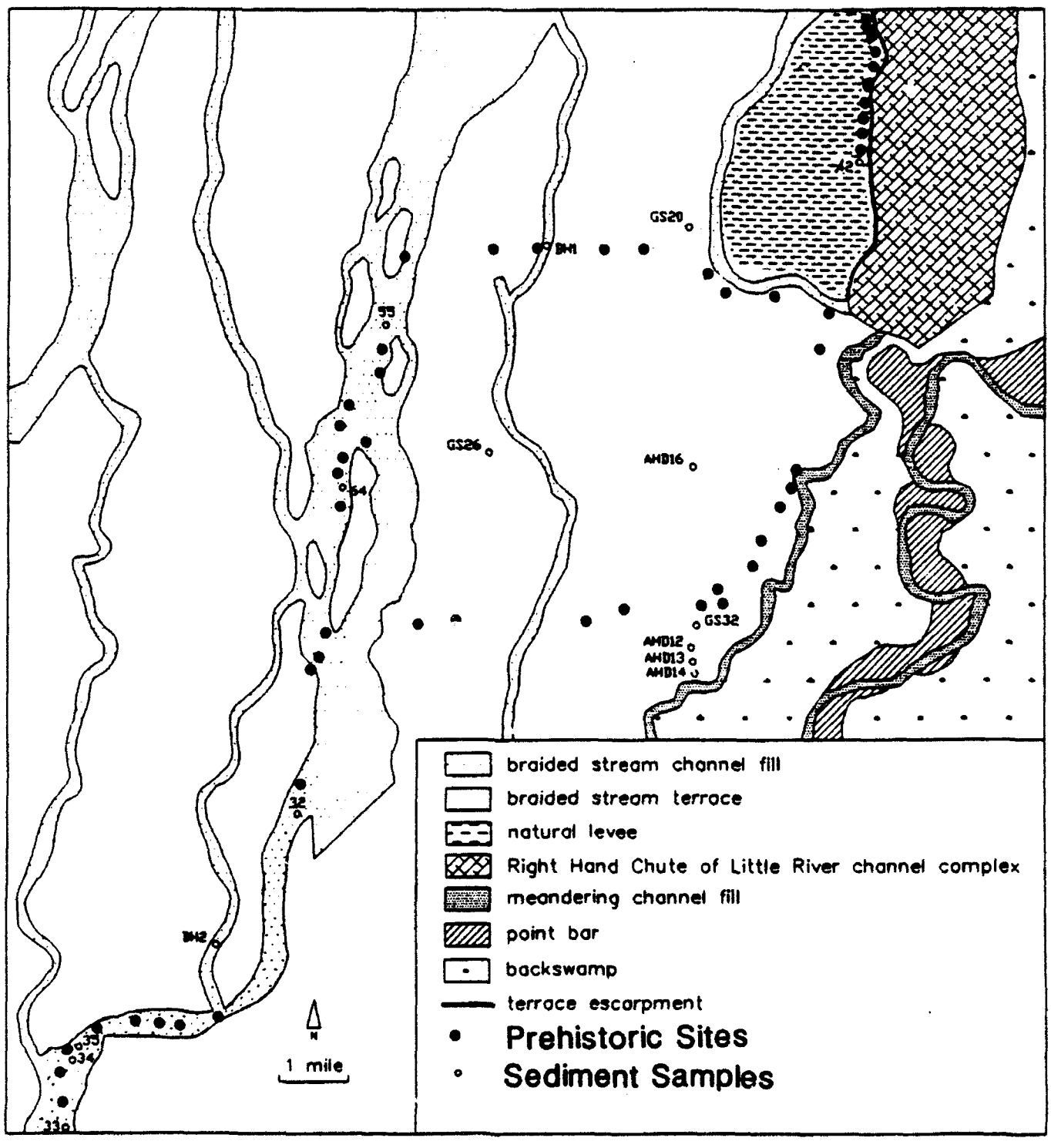


Figure 71. Geomorphic Map of the Project Area.

was stirred and samples of the suspended sediment were drawn off at appropriate depths and times to determine the abundances of silt and clay. Particle size analysis of three silt fractions and the clay fraction were determined. In addition, the total sand, silt, and clay contents were determined.

Pollen Analysis

Eighteen samples were collected from two palynological columns excavated in two backhoe trenches in the study area and these were sent to Dr. Richard G. Holloway at the palynological laboratory at Texas A & M University for analysis. Prior to pollen analysis, the samples were analyzed for pH, organic matter OM, N, P, K, Na, Mg, and salinity to determine the potential for pollen preservation (Table 68). Based on the results of the soil analysis, two samples were deemed to be worthy of further analysis. Thirty milliliters of sediment were subsampled for pollen analysis. Two Lycopodium species tracer spore tablets, each containing 11300 +/- 400 spores were added to each sample. These Lycopodium spores were added for later calculation of pollen concentrations (Bryant and Holloway 1983) and to insure that pollen was not destroyed during routine extraction procedures. Extraction of pollen followed the methods of Faegri and Iverson (1975). Following the addition of the Lycopodium spores, the samples were treated with 36% hydrochloric acid. This step removes all carbonates from the sample, and dissolves the calcium bonding in the spore tablet. The samples were then washed thoroughly, screened through 350 micron mesh sieves, and treated with 70% hydrofluoric acid for the removal of silicates. After 24 hours, the samples were washed several times and placed into 50 ml tubes. The samples were subjected to heavy density separation using a solution of zinc chloride to separate the lighter organic fraction from the inorganic materials. The lighter organic fraction was removed by pipette. This process was repeated twice to insure that all organic materials were removed from the sediments. The organic components were cleansed of all residual zinc chloride, and placed in 15 ml tubes. At this time the residue was examined for pollen.

Table 68. Soil Test Results From Backhoe Trench 1 and Backhoe Trench 2.

PROVENIENCE	PH	ORG %	N	P	K	CA	MG	SALINITY	NA
SITE BH-1:									
50-70 cm	7.6	1.1	1	32	292	974	379	175	52
*70-80 cm	6.9	>4.2	6	47	340	3521	426	260	105
*80-90 cm	6.9	>4.2	5	17	212	3521	426	195	175
165-185 cm	8.7	1.3	1	7	468	2389	366	78	210
185-205 cm	8.0	0.8	1	1	592	3382	426	143	210
205-225 cm	7.9	0.7	1	19	500	2349	426	143	175
225-245 cm	7.8	2.4	1	4	504	3521	426	240	175
245-265 cm	6.3	1.9	1	4	420	3521	426	1103	175
265-285 cm	7.2	0.1	3	20	392	2595	426	520	175
SITE BH-2:									
50-60 cm	7.6	0.3	6	63	192	3521	426	260	175
60-70 cm	7.9	3.6	13	74	328	3521	426	390	175
70-80 cm	8.3	2.6	9	33	660	3521	426	292	350
80-100 cm	8.4	2.0	8	26	540	3521	426	260	350
100-120 cm	8.4	2.9	4	25	488	3521	426	260	350
120-130 cm	8.2	1.8	13	1	432	3521	426	845	350
130-150 cm	8.0	1.4	18	1	400	3521	426	1300	157
150-210 cm	8.7	0.4	1	6	352	1103	298	123	122
>210 cm	8.3	2.3	16	51	612	3521	426	1040	122

* indicates samples processed for pollen

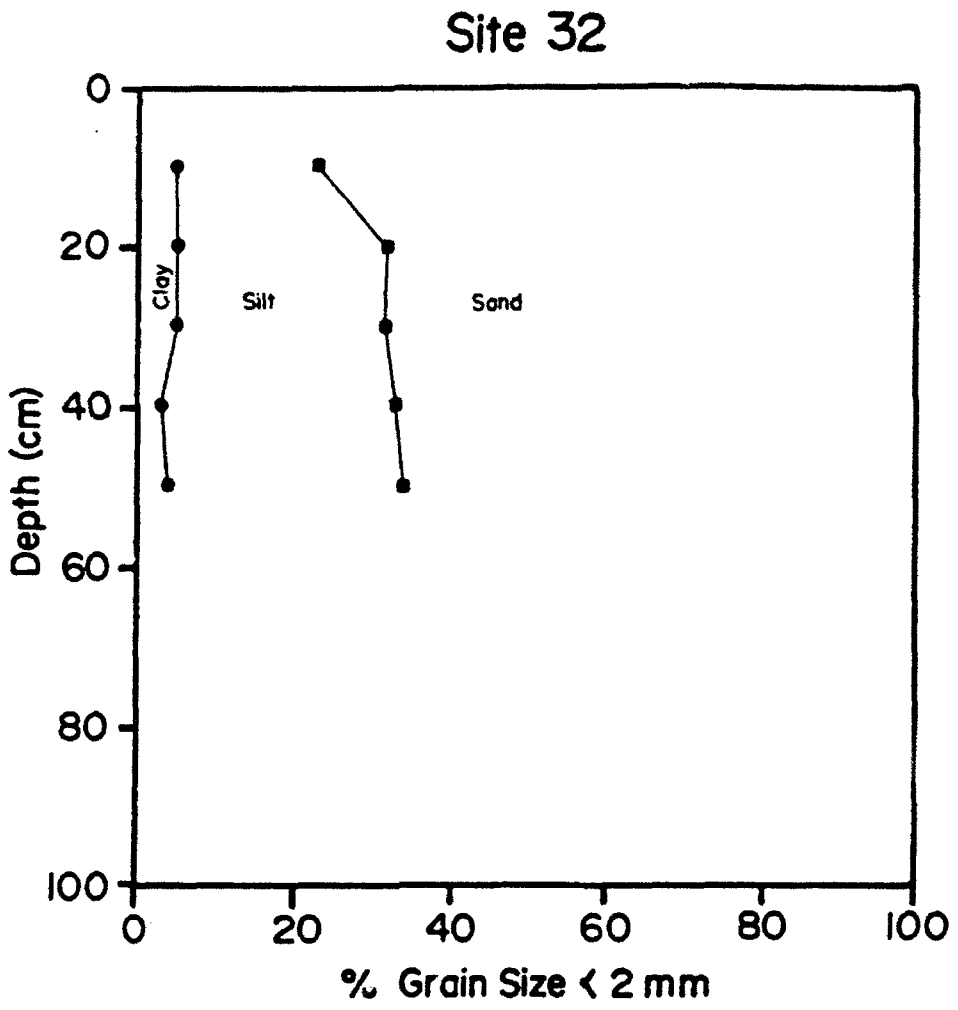
RESULTS

Sedimentological Characteristics

Detailed grain size analysis of sediments from seven test units and two backhoe trenches was undertaken. Representative samples were obtained from sites along Ditches 7, 13, and Buffalo Creek Ditch. These analyses were interpreted in order to determine the geomorphic environment in which the sediments had been deposited.

Site 32

Site 32 is located near the western boundary of Mississippi County and straddles Buffalo Creek Ditch. The sediments in the uppermost 15 cm of the test unit consist of pale brown (10YR 6/3) loamy sands, with massive structure. The unit displays a



SAMPLE	DEPTH	TOTAL			GRAVEL	SAND					SILT			CLAY
		SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
1	0-15cm	77	18	5	0	0	2	17	41	17	12	4	2	5
2	15-20	68	27	5	0	0	0	6	38	24	18	5	3	5
3	20-30	69	27	5	0	0	0	5	38	26	19	5	2	5
4	30-40	66	30	3	0	0	0	4	36	25	23	5	2	3
5	40-50	66	30	4	0	0	0	4	37	24	24	5	1	4

PERCENT ERROR

1= 3.72218899
2= 4.29738257
3= 4.3979478
4= 3.30440282
5= 3.52592085

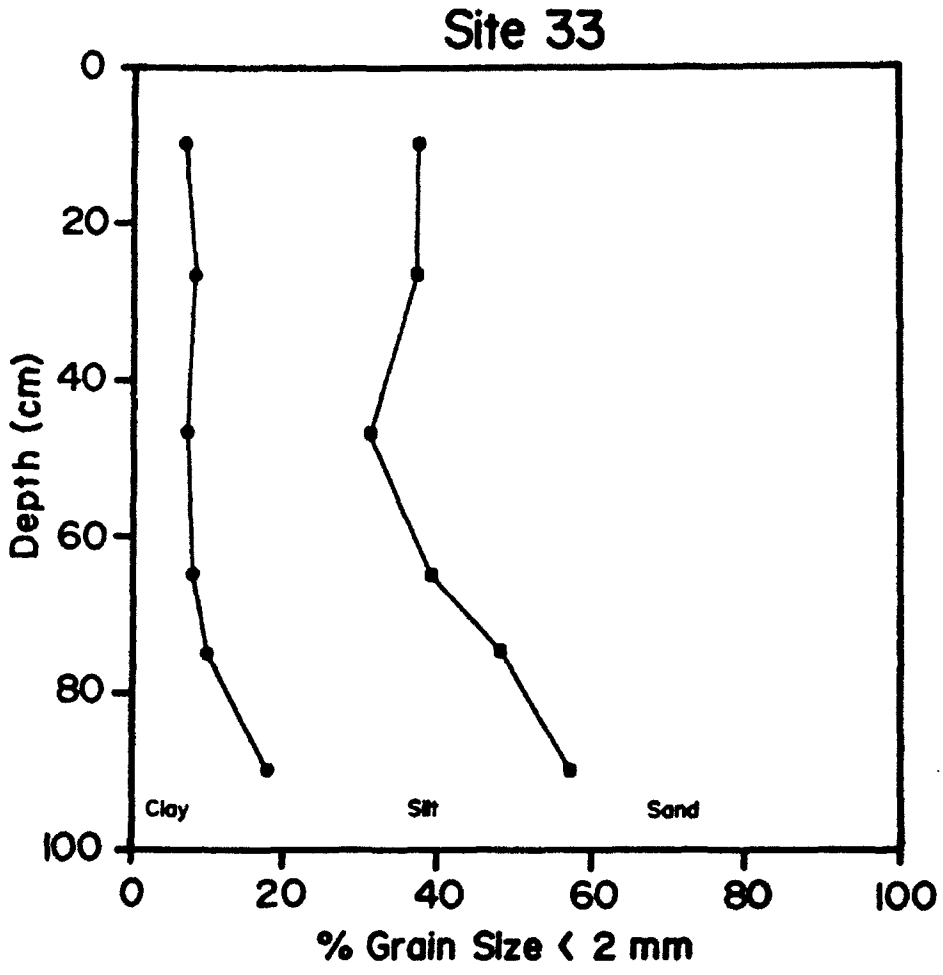
Figure 72. Soil Textures and Grain Size Analysis, Site 32.

gradational lower contact with the underlying unit. The sand fraction of the sediments in this horizon is dominated by fine sand with substantially smaller amounts of medium and very fine sand. Coarse and very coarse sand is essentially absent from the total sand fraction. The silt fraction is dominated by coarse silt. From 15-20 cm, the sediment is a grayish brown (10YR 5/2) sandy loam with massive structure. The sediment is dominated by fine and very fine sand with the virtual absence of coarser sand fractions. The silt fraction is predominately coarse silt. This unit possesses a gradational lower boundary with the underlying unit. From 20-30 cm the sediment is a brown (10YR 5/3) sandy loam with massive structure. The sand fraction in this unit is dominated by fine and very fine sand to the virtual absence of any coarser sand fractions. The silt fraction is dominated by coarse silt. The unit possesses a gradational lower boundary with the underlying unit. From 30 cm to the base of the pit at 80 cm, the sediment is a very pale brown (10YR 7/3) sandy loam with massive structure. The sediment is dominated by fine and very fine sand with coarse fractions being absent. The silt fraction is overwhelmingly coarse.

The sedimentary deposits displayed in this pit are interpreted, on the basis of their grain size distributions, to be braided stream channel fill. The predominance of fine and very fine sands and the absence of any coarser sand fractions leads to such an interpretation (Selley 1982). For these sediments to be interpreted as braided stream terrace deposits there would need to be a greater abundance of the coarser sand fractions. Detailed grain size analyses and graphical representation of the sedimentological data are presented in Figures 72.

Site 33

Site 33 is located in northern Poinsett County on the eastern side of Buffalo Creek Ditch. The uppermost 40 cm of this pit consists of brown to dark brown (10YR 4/3) sandy loam with massive structure. The sediment is dominated by fine sand with smaller and approximately equal amounts of medium and very fine sand. Negligible amounts of coarser sand fractions are present. The silt fraction is predominately coarse silt. This uppermost unit has a clear lower contact with the underlying unit. From 40-70 cm is a second distinct sandy loam that is very dark grayish brown (10YR 3/2) in color with dark gray brown (10YR 4/2) mottles. The unit is massive in structure. The sediments in this unit are predominately fine sands, with smaller but similar amounts of medium and very fine sand and essentially no coarser sand fractions. The silt fraction is again dominated by coarse silt. This unit has a clear lower contact with the unit beneath. From 70 cm to the base of the pit the sediment is a light brownish gray (10YR 6/2) loam with strong brown (7.5YR 5/6) mottles. The sediment is dominated by coarse silt with smaller amounts of fine and very fine sand. Coarser sand fractions are essentially absent. The loam is massive in structure. The sediments are interpreted to be braided stream channel fill



SAMPLE	DEPTH	TOTAL			GRAVEL	SAND					SILT			CLAY
		SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
021387-16	0-20cm	63	30	7	0	1	1	17	29	16	19	8	3	7
021387-17	20-40	62	29	8	0	1	2	13	29	19	19	8	2	8
021387-18	40-60	70	22	7	0	0	1	14	34	21	16	5	1	7
021387-19	60-70	61	31	8	0	2	3	11	25	19	24	6	1	8
021387-20	70-80	50	38	10	0	0	1	8	22	20	29	7	2	10
021387-21	80-100	43	39	18	0	1	2	7	16	17	29	8	2	18

PERCENT ERROR

021387-21= 2.51829712
021387-16= .570834229
021387-17= .43085828
021387-18= 2.15178674
021387-19= 1.24748145
021387-20= 2.21235372

Figure 73. Soil Textures and Grain Size Analysis, Site 33.

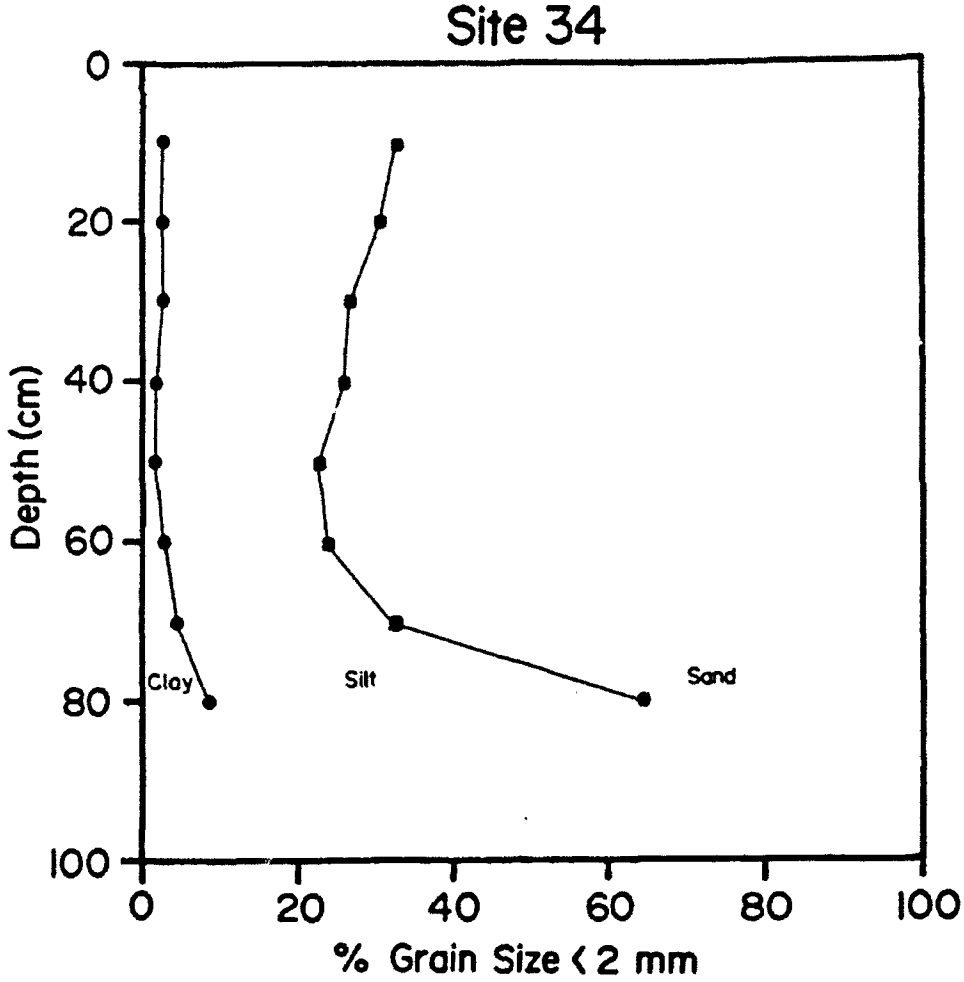
deposits on the basis of their grain size distributions. The lack of any coarse sand fractions, and the predominance of fine grain size sediments supports this interpretation. Detailed grain size data and their graphical presentation are shown in Figure 73.

Site 34

Site 34 is located near the northern boundary of Poinsett County on the eastern side of Buffalo Creek Ditch. The uppermost 20 cm of the pit contains yellowish brown (10YR 5/6) sandy loam with weak granular structure. The lower boundary of this unit is gradational with the underlying unit. From 20-40 cm the sediment consists of a brown (10YR 5/3) sandy loam with weak granular structure. The lower boundary of this unit is gradational. From 40-50 cm the sediment consists of yellowish brown (10YR 5/6) loamy sand with weak granular structure. This unit possesses a gradational lower boundary. From 50-60 cm the sediment is a pale brown (10YR 6/3) loamy sand with weak granular structure and a gradational lower boundary. The six uppermost sedimentary units exposed in this pit display similar grain size distributions. The sediments are dominated by fine sand with smaller, and approximately equal amounts of medium and very fine sand. There is a virtual absence of coarser sand fractions. The silt fraction is dominated by coarse silt, with substantially smaller amounts of finer silt fractions. Clay is present in extremely small amounts. From 60-70 cm the sediment displays a marked fining. This unit consists of a light yellowish brown (10YR 6/4) sandy loam with weak granular structure. Again the sediment is dominated by fine sand with somewhat smaller amounts of medium and very fine sand. This unit also contains slightly greater abundances of coarse sand fractions, though these values remain below 5%. The silt fraction remains dominated by coarse silt. Clay content is slightly greater than the overlying units. This unit possesses a gradational lower boundary. The lowest unit exposed in the pit is a substantially finer grained unit. The unit consists of a light yellowish brown (10YR 6/4) silt loam. The sediment is dominated by silt, with relatively small amounts of any of the sand fractions. None of the sand fractions exceeds 10% by weight. Clay content is almost 10%. All of the sedimentary units exposed in the pit contain extremely small amounts of gravel. This sequence of sedimentary deposits is interpreted to represent a braided channel fill on the braided stream surface. The sediments are dominated by the finer sand fractions and silt. Overall the sediments are regarded as being too fine to be braided stream terrace deposits as they lack coarse and very coarse sand and contain essentially no gravel (Selley 1982). Detailed sedimentological analyses and their graphical representation are presented in Figure 74.

Site 35

Site 35 is located near the northern boundary of Poinsett County on the eastern side of Buffalo Creek Ditch. The uppermost

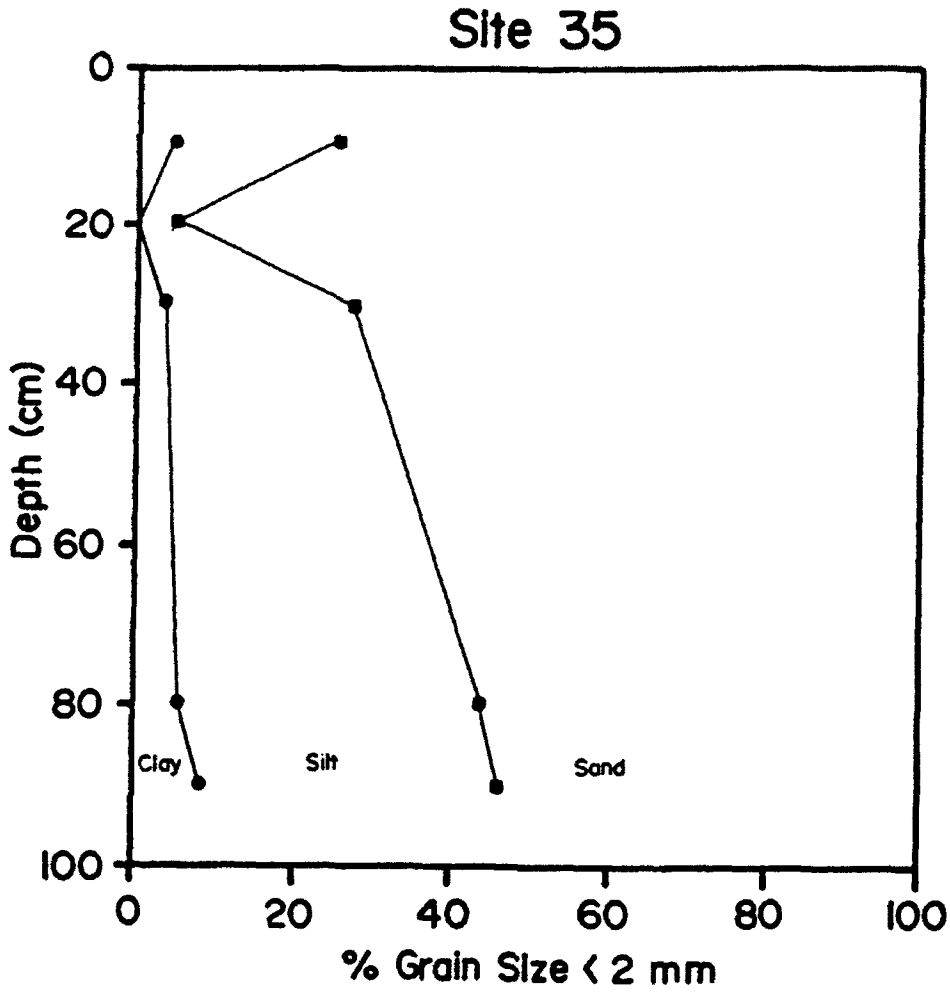


SAMPLE	DEPTH	TOTAL			GRAVEL	SAND					SILT			CLAY
		SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
1	0-10cm	68	30	3	1	0	0	16	36	14	23	5	2	3
2	10-20	69	28	3	1	0	1	17	37	14	22	3	3	3
3	20-30	73	24	3	1	0	1	16	40	15	20	3	1	3
4	30-40	74	24	2	0	1	1	17	39	16	21	2	1	2
5	40-50	78	21	2	0	0	1	18	42	16	18	2	1	2
6	50-60	77	21	3	0	0	1	17	41	18	16	4	1	3
7	60-70	67	28	5	4	4	4	15	29	15	22	5	1	5
8	70-80	35	56	9	2	3	6	7	10	10	42	11	3	9

PERCENT ERROR

1= 8.68453213
2= 5.80913685
3= 3.67148508
4= 4.33085475
5= 4.38717222
6= 6.26403745
7= 14.1596474
8= 24.3992092

Figure 74. Soil Textures and Grain Size Analysis, Site 34.



SAMPLE	DEPTH	TOTAL			GRAVEL	SAND					SILT			CLAY
		SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
1	0-10cm	75	21	5	0	0	3	25	33	13	12	7	2	5
2	10-20	97	5	-1	0	0	8	41	36	12	3	0	2	-1
3	20-30	72	24	4	0	1	1	18	37	15	16	6	2	4
4	70-75	55	39	6	0	0	1	15	27	12	25	11	3	6
5	80-85	52	38	9	0	0	1	14	27	11	26	9	3	9

PERCENT ERROR

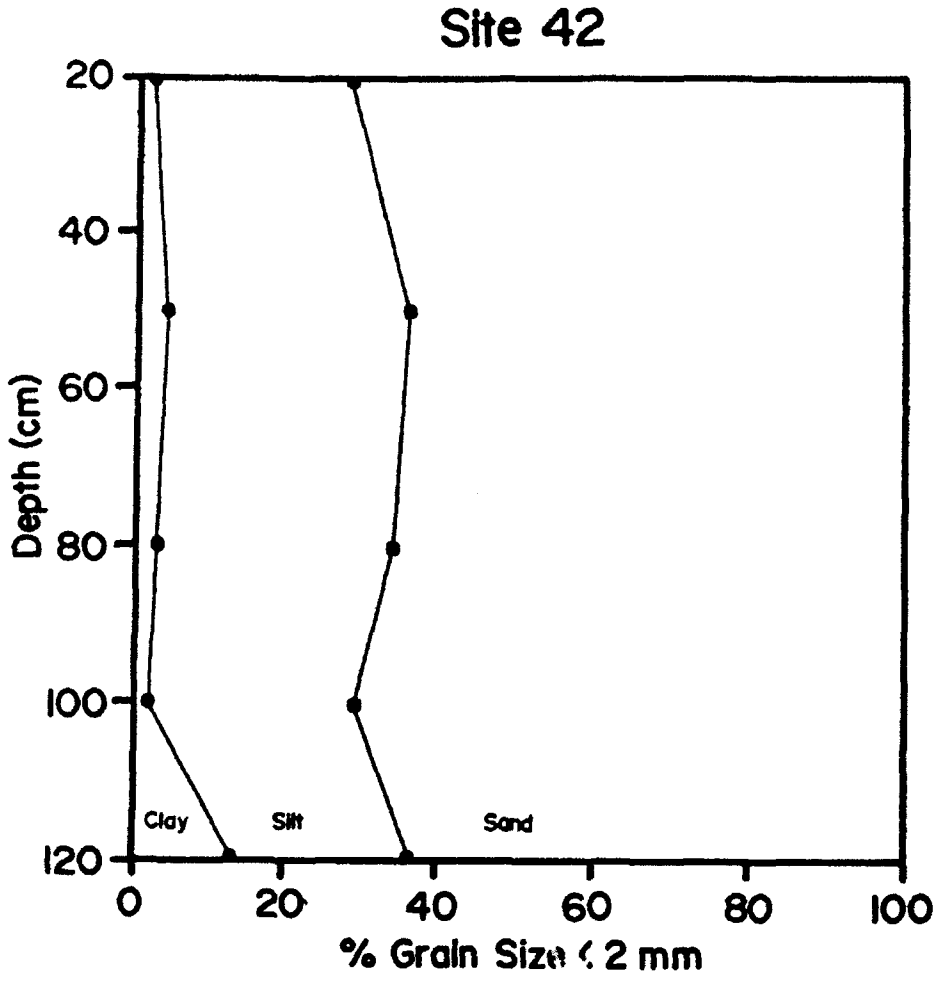
1= 4.0331661
2= 5.47341221
3= 5.13403562
4= 7.46071142
5= 5.02046989

Figure 75. Soil Textures and Grain Size Analysis, Site 35.

10 cm of sediment consists of a brown (10YR 5/3) loamy sand with massive structure. The sediment is dominated by sand with smaller, yet substantial amounts of medium sand. A little over 10% of the sand fraction is very fine. Coarse sand fractions are present in abundances of less than 5%. The silt fraction is dominated by coarse silt with substantially smaller amounts of finer silt fractions. This unit displays a sharp lower boundary. From 10-20 cm the sediment is a brown (10YR 5/3) sand with granular structure. Medium and fine sand fractions are co-dominant, with substantially smaller amounts of coarse and very fine sand. The sediment contains essentially no silt and clay. The sand horizon has a sharp lower boundary. From 20-70 cm is a dark gray (10YR 4/1) sandy loam with massive structure. The sediments are dominated by fine sand with substantially smaller but similar amounts of medium and very fine sand. The silt fraction is dominated by coarse silt with less than 10% by weight of finer silt fractions. The unit has a gradational lower boundary. From 70-80 cm is a dark grayish brown (10YR 4/2) sandy loam with fine subangular blocky structure. The sediment is co-dominated by fine sand and coarse silt with smaller but similar amounts of medium and very fine sand. Coarser sand fractions are absent and there are small amounts of finer silt fractions and clay. This unit possesses a gradational lower boundary. From 80-85 cm is a very dark grayish brown (10YR 3/2) sandy loam with fine subangular blocky structure. The grain size distributions of this unit are similar to that above. This sedimentary sequence is interpreted to be braided channel fill deposit except for Sample 2. The sand fraction of the deposit is dominated by fine sands and coarse silt, too fine to be braided stream terrace deposits (Selley 1982). Detailed grain size analyses and their graphical representation are presented in Figure 75.

Site 42

Site 42 is located along Ditch 7 approximately two miles east of Manila, Arkansas in Mississippi County. The uppermost unit exposed in this test pit extends from the surface to a depth of 20 cm. The sediment consists of a brown (10YR 5/3) loamy sand/sandy loam with fine granular structure and a gradational lower boundary. From 20 cm is a brown to dark brown (10YR 4/3) sandy loam with weak granular structure and a clear lower boundary. At the base of this unit is a 3-5 cm thick layer of very compact dark yellowish brown (10YR 3/4) sandy loam. From 90-100 cm is a yellowish brown (10YR 5/4) sandy loam with weak granular structure and a clear lower contact. In the bottom of the pit from 100-120 cm is a dark yellowish brown (10YR 4/4) sandy loam with weak granular structure. The grain size distributions in all of these units are similar. The sediments are dominated by fine sand, with substantially smaller amounts of medium and very fine sand. Fine sand is commonly around 20% while the medium sand never exceeds 10%. No coarser sand fractions are present. The silt fraction is dominated by coarse silt. Apart from the lowermost unit, clay contents never exceed 5%. The grain size distributions suggest that this sedimentary sequence is a natural levee deposit. The sands are too fine for this to be a braided



SAMPLE	DEPTH	TOTAL			GRAVEL	SAND					SILT			CLAY
		SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
1	10-20cm	72	26	2	0	0	0	10	42	19	21	4	1	2
2	40-50	64	32	4	0	0	0	9	37	18	24	6	2	4
3	70-80	66	31	3	0	0	0	8	38	19	23	6	2	3
4	90-100	69	27	2	0	0	0	8	39	22	21	5	1	2
5	110-120	65	23	13	0	0	0	6	34	24	18	4	1	13

PERCENT ERROR

1= 5.49585737
2= 3.7126661
3= 4.13481262
4= 4.61684785
5= 4.17199071

Figure 76. Soil Textures and Grain Size Analysis, Site 42.

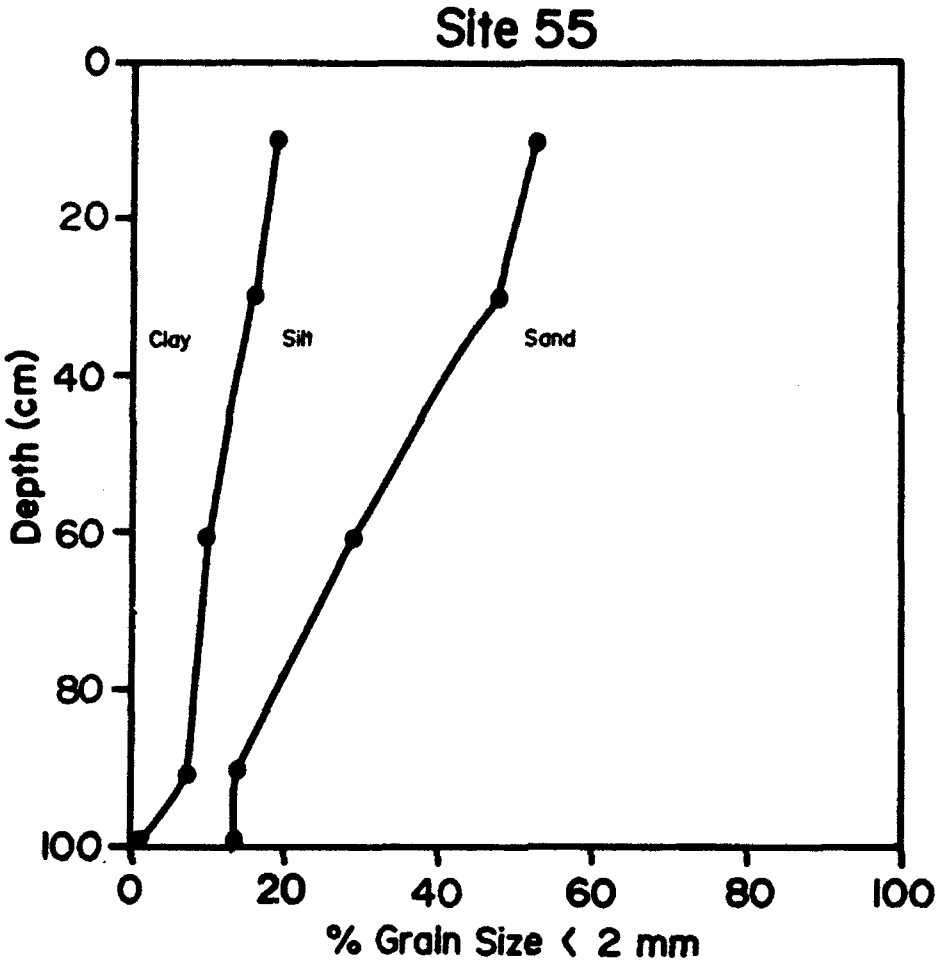
stream terrace deposit and the overall grain size distribution is too coarse to be a channel fill deposit (Selley, 1982). Detailed grain size distributions and their graphical representation are presented in Figure 76.

Site 55

Site 55 is located along Buffalo Creek Ditch in eastern Mississippi County. The upper 15 cm of the profile exposed in this pit consists of a very dark grayish brown (10YR 3/2) loam with massive structure. The sand fraction of the sediment is dominated by fine sand with slightly smaller amounts of medium and very fine sand fractions. Coarser sand fractions are present in very small amounts. The silt fraction consists of similar amounts of both coarse and medium silt. The sediment contains approximately 20% clay. Slightly less than 10% gravel also occurs in the sediment. The lower 5 cm of this unit contains abundant iron concretions. From 15-65 cm is a sandy loam, with the upper 15 cm being very dark brown (10YR 2/2) in color and the lower 35 cm being dark grayish brown (10YR 4/2) in color. This horizon is also abundant in iron concretions. The <2 mm fraction possesses massive structure. The sediments of this thick sandy loam unit are dominated by fine sand with smaller amounts of medium and very fine sand. Coarser sand fractions are present in very small amounts. The silt fraction contains approximately equal amounts of coarse and medium silt, with substantially smaller amounts of fine silt. Moderate amounts of clay are also present. The sandy loams contain small amounts of gravel. These sediments are interpreted to be channel fill deposits on the basis of their grain size distributions (Selley 1982). From 65-70 cm is a light olive brown (2.5YR 5/4) sand with granular structure and gradational lower boundary. Below this horizon is a brown to dark brown (10YR 4/3) sand which extends from 70-90 cm although the lower boundary is uneven. From the base of this horizon to a depth of 105 cm is a light brown (2.5Y 5/4) sand that is massive in structure and possesses an abrupt lower boundary. The sand units are dominated by fine sand with smaller amounts of medium and very fine sand. Coarser sand fractions and gravel are present in negligible amounts. From 105-125 cm is a very dark grayish brown (10YR 3/2) sandy loam (field texture) with angular blocky structure and an abrupt lower boundary. The bottom of the test pit was waterlogged and consisted of a dark gray (5Y 4/1) clay (field texture). These sandy sediments are interpreted on the basis of grain size data to be a braided stream terrace deposit. This interpretation is based on the predominance of sand and small amounts of silt and clay in the deposit (Selley 1982). The two lowest units may be either channel fills or simply fine grained lenses in the braided stream terrace deposits. Detailed grain size analysis and its graphical representation are presented in Figure 77.

Site 64

Site 64 is located in western Mississippi County on the eastern side of Buffalo Creek Ditch. The upper 20 cm of the test

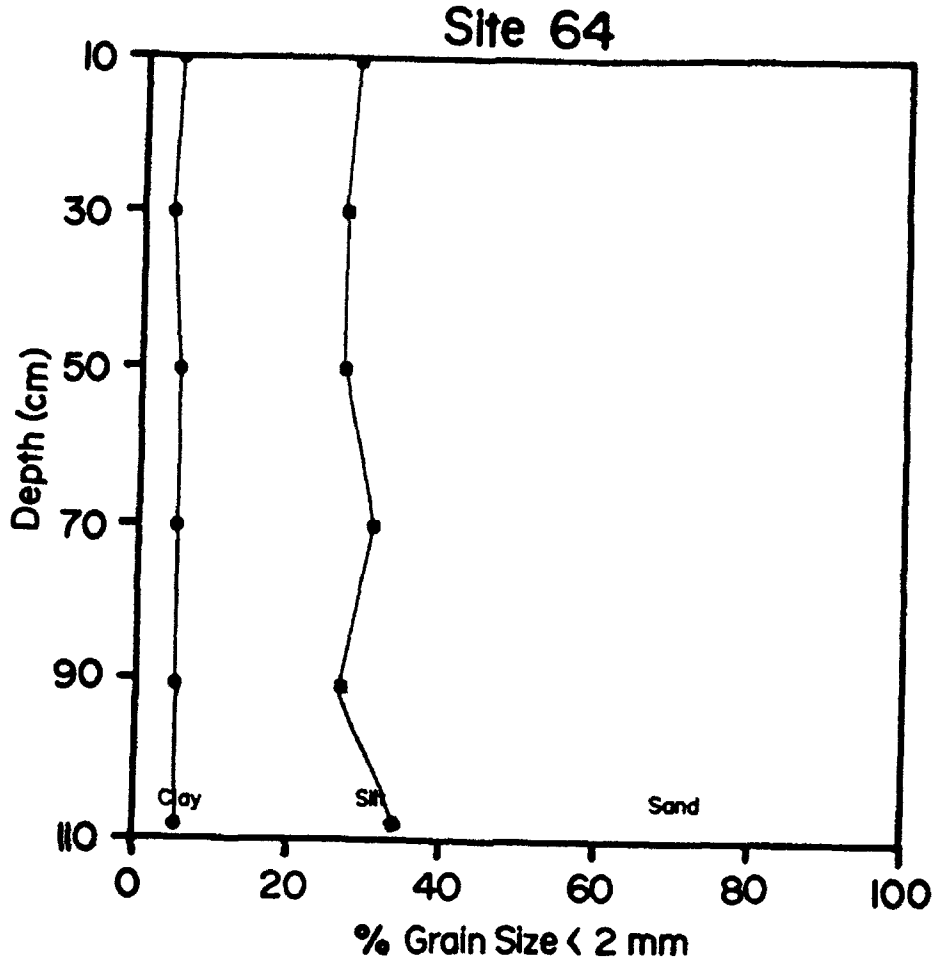


SAMPLE	DEPTH	TOTAL			GRAVEL	SAND					SILT			CLAY
		SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
1	5-10cm	47	34	19	8	2	3	13	20	9	14	13	7	19
2	23-35	63	22	16	11	4	5	18	26	10	9	9	4	16
3	55-65	71	18	10	5	2	2	18	36	13	8	7	3	10
4	75-85	88	7	6	0	0	1	38	40	8	4	4	-1	6
5	95-105	87	11	1	2	2	2	17	48	19	6	4	1	1

PERCENT ERROR

1= .878429101
2= .547764913
3= 1.21425579
4= 2.39007621
5= 3.80069529

Figure 77. Soil Textures and Grain Size Analysis, Site 55.



SAMPLE	DEPTH	TAL			GRAVEL	SAND					SILT			CLAY
		SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
021287-13	0-10	76	21	4	1	5	7	13	36	16	14	6	1	4
021287-14	10-30	74	21	5	0	0	2	15	40	17	14	5	2	5
021287-15	30-50	76	18	5	0	0	2	13	45	16	12	5	1	5
021287-16	50-70	77	18	5	0	0	0	13	47	17	12	5	1	5
021287-17	70-90	75	20	5	0	0	1	11	46	17	14	5	1	5
021287-18	90-110	77	19	4	0	0	1	11	47	17	13	4	2	4

PERCENT ERROR

021287-15= 2.52162087
021287-16= 1.90946571
021287-17= 2.95131876
021287-18= 2.20213309
021287-14= 2.19026176
021287-13= 3.95429459

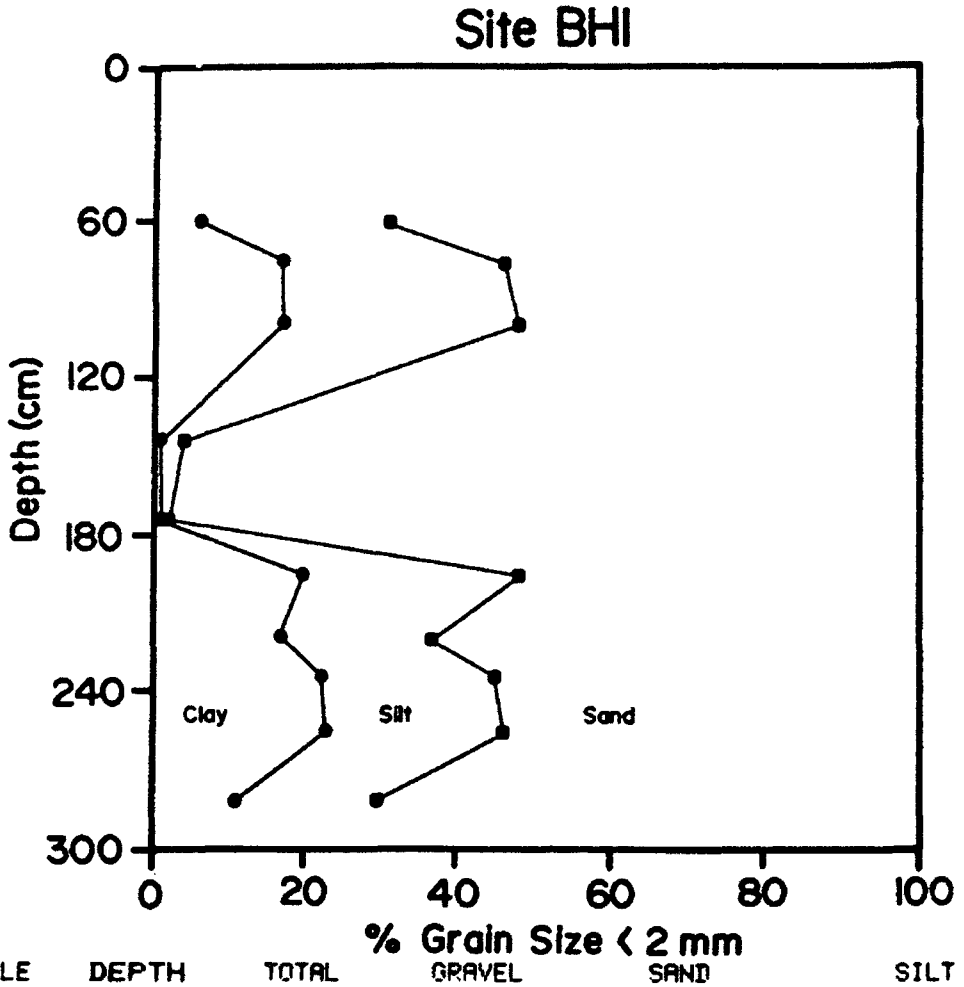
Figure 78. Soil Textures and Grain Size Analysis, Site 64.

pit consist of a dark brown (10YR 3/3) sandy loam with massive structure. It possesses a gradational lower boundary. From 55-105 cm the sediment exposed in the pit consists of a dark yellowish brown (10YR 3/4) sandy loam with light olive brown (2.5YR 5/4) mottles. This unit is massive in structure and possesses an abrupt lower boundary. The lowest horizon exposed in the pit is a dark gray brown (10YR 4/2) sandy loam with massive structure. With the exception of the uppermost unit, which contains some coarse and very coarse sand fractions, all of the units exposed in this pit are dominated by fine sand. There are substantially smaller, but similar, amounts of medium and very fine sand. The silt fraction is dominated by coarse silt, with substantially smaller amounts of medium and fine silt. None of the units contains more than 5% clay. The sediment exposed in this pit is interpreted, on the basis of the grain size distribution, to be channel fill. The sediment is believed to be too fine to be a braided stream terrace deposit. Detailed grain size analyses and their graphical representation are presented in Figure 78.

Backhoe Trench 1 (BH 1)

Backhoe Trench 1 is located on the north side of Ditch 13 east of the town of Manila in Mississippi County. The trench wall sediments were sampled at approximately 10 cm intervals making certain that all units exposed in the wall were sampled. The sampling of sediments was begun at 50 cm because of disturbed backhoe material at the top of the trench. The uppermost 20 cm from 50-70 cm, consists of a dark yellowish brown (10YR 4/4) sandy loam with massive structure. This sediment is dominated by fine sand, with substantially smaller, but similar, amounts of medium and very fine sand. Coarser sand fractions are essentially absent. The silt fraction is dominated by coarse silt with substantially smaller amounts of fine and medium silt. Clay is present in very small amounts, and there is no gravel in the sediment. This unit possesses a gradational lower boundary. From 70-80 cm is a dark olive gray (5Y 3/2) loam with massive structure and a gradational lower boundary. This loamy sediment continues to a depth of 90 cm but from 80-90 cm lightens in color to an olive gray (5Y 4/2). The sediment contains co-dominant amounts of fine and medium sand, with substantially smaller amounts of very fine sand. There is a negligible amount of coarser sand fractions. The silt fraction is dominated by coarse silt with substantially smaller amounts of medium and fine silt. The sediment contains slightly less than 20% clay. The sediment in the uppermost 90 cm of the trench is interpreted, on the basis of grain size distributions, to be indicative of a channel fill deposit. The predominance of the fine grained sand fraction and abundant silt together with relatively abundant clay content leads to such a conclusion (Selley, 1982).

Below the loam is a thick unit dominated by medium sand which extends from 90-185 cm. The sand has a granular structure and is light brownish gray (10YR 6/2) in color. The sediment is dominated by medium sand, with substantially smaller amounts of



SAMPLE	DEPTH	TOTAL			GRAVEL	SAND					SILT			CLAY
		SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
BH 1-10	50-70cm	68	25	6	0	0	2	17	32	17	20	4	1	6
BH 1-9	70-80	45	39	17	0	1	2	14	18	9	21	12	6	17
BH 1-8	80-90	42	41	17	0	0	2	13	18	9	27	10	4	17
BH 1-7	90-150	96	3	1	0	1	13	49	29	4	2	0	1	1
BH 1-6	150-185	97	1	1	0	1	13	51	28	4	1	0	0	1
BH 1-5	185-205	43	38	20	0	0	3	16	16	8	21	12	5	20
BH 1-4	205-225	53	30	17	0	0	5	20	19	8	17	9	4	17
BH 1-3	225-265	45	32	23	0	1	5	18	16	5	17	12	3	23
BH 1-2	265-285	43	33	23	0	0	5	20	16	2	16	13	4	23
BH 1	285-300	71	19	11	0	1	9	34	26	2	8	7	4	11

PERCENT ERROR

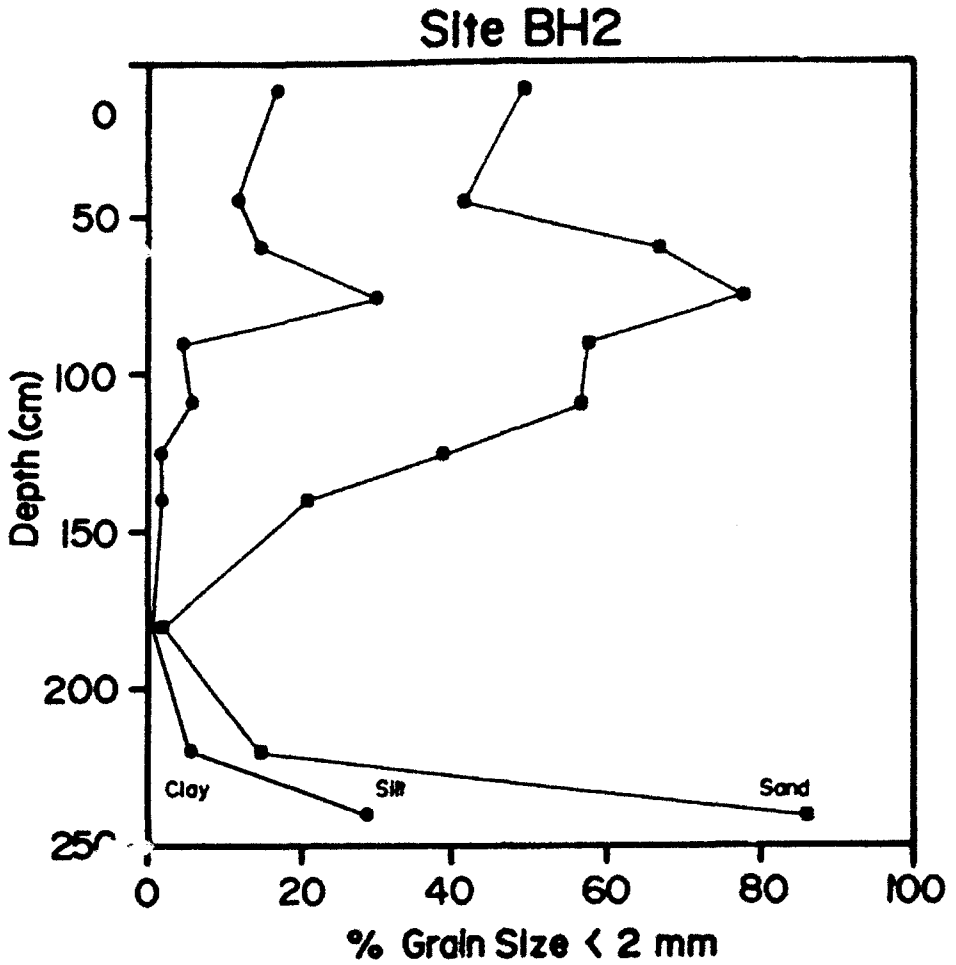
BH 1-10= 2.38980343
BH 1-9= .195709411
BH 1-8= .0636865585
BH 1-7= .620977441
BH 1-6= .64724709
BH 1-5= .288864367
BH 1-4= .846451815
BH 1-3= .332216361
BH 1-2= .335764705
BH 1= 4.13094801

Figure 79. Soil Textures and Grain Size Analysis, Site BHI.

fine sand. Less than 5% very fine sand is present and there is almost 15% coarser sand fractions. Silt and clay size fractions are essentially absent. This sand unit is interpreted to be a braided stream terrace deposit on the basis of the dominance of the medium and coarse sand fractions and the virtual absence of fine fractions (Selley 1982). From 185-205 cm is a very dark gray (5Y 3/1) loam with massive structure. Beneath the loam is a very dark gray (5Y 3/1) sandy loam with massive structure extending from 205-225 cm. From 225-265 cm is another loamy unit that is also very dark gray in color with massive structure and a gradational lower boundary. From 265 cm to the base of the trench is a very dark gray (2.5Y 3/0) sandy loam. The sediment in the lowermost units of the backhoe trench possesses similar grain size distributions. It is predominately medium sand with slightly smaller amounts of fine sand and substantially smaller amounts of very fine sand. There is essentially no very coarse sand in the sediment. The silt fraction is dominated by coarse silt with substantially smaller amounts of fine and medium silt. There is approximately 20% clay in the sediment. These lowermost units are interpreted to be indicative of a channel fill deposit (Selley 1982). Detailed grain size analyses and graphical representation of the data are presented in Figure 79.

Backhoe Trench 2 (BH 2)

Backhoe Trench 2 was excavated at a site approximately one quarter of a mile north of Buffalo Creek Ditch in southern Craighead County. The uppermost unit, extending from 0-20 cm consists of a loam with massive structure and an abrupt lower contact. From 20-40 cm a strongly cemented fragipan has developed. Beneath the fragipan, from 40-50 cm, is a strong brown (7.5YR 4/6) sandy loam with massive structure and a gradational lower boundary. Within this unit are large fragments of iron rich fragipan. From 50-70 cm is a dark gray (10YR 4/1) silt loam with moderate fine subangular blocky structure and a gradational lower boundary. From 70-80 cm there is a slight fining of the sediment to a dark gray (10YR 4/1) clay loam with massive structure and a gradational lower boundary. Beneath the clay loam the sediment coarsens slightly to a dark brown (10YR 3/3) silt loam with moderate fine subangular blocky structure which extends from 80-100 cm depth. From 100-120 cm is a dark brown (7.5YR 3/2) silt loam with moderate fine subangular blocky structure with a sharp lower boundary. From 120-130 cm is a dark gray (5Y 4/1) sandy loam with brown to dark brown (7.5YR 4/4) mottles. The sandy loam is massive in structure with a sharp lower contact. The sediment in the upper 130 cm of the trench displays similar grain size distributions. Generally the sediment is dominated by medium sand with slightly smaller amounts of fine sand and substantially smaller amounts of coarse sand. Except for the uppermost 40 cm of sediment, there are generally negligible amounts of coarse sand. The silt fraction is dominated by coarse silt with substantially smaller amounts of medium and fine silt. Clay contents are variable in their abundance. The grain size distributions of the sediment are indicative of a channel fill deposit which fines progressively upward (Selley 1982).



SAMPLE	DEPTH	TOTAL			GRAVEL	SAND					SILT			CLAY
		SAND	SILT	CLAY		VC	C	M	F	VF	C	M	F	
BH 2-13	0-20cm	50	33	17	5	4	5	16	17	9	18	11	4	17
BH 2-11	20-50	59	30	12	2	7	12	18	14	9	18	9	3	12
BH 2-10	50-70	33	52	15	0	0	15	4	7	7	30	18	4	15
BH 2-9	70-80	22	48	30	0	1	2	7	8	4	25	17	6	30
BH 2-8	80-100	42	53	5	0	1	5	18	13	5	32	18	3	5
BH 2-6	100-120	44	51	6	0	1	5	20	15	4	31	17	3	6
BH 2-5	120-130	62	37	2	0	1	5	26	22	7	24	11	2	2
BH 2-4	130-150	78	19	2	1	1	7	38	27	5	11	7	1	2
BH 2-3	150-200	98	2	0	0	1	14	46	33	3	1	1	0	0
BH 2-2	200-225	85	9	6	0	1	10	47	26	2	3	3	3	6
BH 2-1	225-250	14	57	29	0	0	2	6	5	1	12	26	19	29

PERCENT ERROR

BH 2-13= 4.6135527
BH 2-11= 3.46376994
BH 2-10= 3.0366542
BH 2-9= 7.10515936
BH 2-8= 5.07997879
BH 2-6= 4.71864236
BH 2-5= 1.42577289
BH 2-4= 1.81556717
BH 2-3= .490440534
BH 2-2= 1.25369786
BH 2-1= 1.11846797

Figure 80. Soil Textures and Grain Size Analysis, Site BH2.

Below the sandy loam, the deposits in the trench display a marked coarsening. From 130-150 cm is a dark gray (5Y 4/1) loamy sand with isolated rounded gravels. The loamy sand is massive in structure with a sharp lower contact. From 150-210 cm is a gray (2.5Y 5/0) medium sand with granular structure and a gradational lower boundary. This sand unit fines slightly toward the base of the trench, becoming a loamy sand below 210 cm. The loamy sand is also gray (2.5Y 5/0) in color with massive structure. Within the loamy sand unit are clasts of gray clay. The grain size analysis of the three lowest units exposed in the trench indicates that the sediment is braided stream channel fill with gray clay clasts and lenses incorporated into the sediment (Selley 1982). Such a clay lense is portrayed by the lowermost data set. Detailed grain size analysis and graphical representation of the data are presented in Figure 80.

DISCUSSION

Pollen Preservation by Richard G. Holloway

There was extremely poor pollen preservation contained within the sediments from the study area. Even if pollen counts were obtained, their interpretive value would be minimal. At this point then, a brief discussion of pollen preservation is in order. There are many complex factors which determine whether pollen grains will remain preserved in a specific type of deposit or if they will be destroyed. As a unit, these factors are generally grouped into three main categories: 1) mechanical, 2) chemical, and 3) biological (Bryant and Holloway 1983).

One of the first agents that begins to destroy pollen either during transportation or deposition, is mechanical degradation. During these phases, certain pollen grains are more easily abraded than are others. Additionally, other factors such as temperature and moisture can affect the pollen grains, once they have been deposited. Holloway (1981) in a series of controlled laboratory experiments demonstrated the types of severe damage that can occur to the pollen wall when it is subjected to alternating periods of wetting and drying. The results of those experiments suggested that archeological sites which are seasonally inundated by rivers or floods, or sites which are located in geographical regions such as northern Arizona, with a distinct seasonality of rainfall, are much more likely to contain severely altered pollen assemblages or to be totally missing them, than are sites which are continuously wet or dry.

Pollen degradation is also caused by chemical agents. Dimbleby (1957) studied the effects of pH on the preservation of pollen grains and his studies revealed that in sediments with a pH greater than 6.0, fossil pollen was not present in sufficient quantity to analyze. Martin (1963) and Bryant (1969) have more

recently demonstrated that fossil pollen can be extracted from alkaline soils ranging in pH from 7.1 to 8.9. However, the highly deteriorated condition of the fossil pollen recovered from high pH soils, often makes analysis and interpretation difficult, if not impossible.

Recent tests have shown that a number of specific chemical compounds can be classified as degradation agents. Holloway's (1981) study revealed that under experimental conditions, nine chemical compounds each caused extremely high percentages of pollen wall degradation. Of these nine compounds, six contained chlorine, three contained magnesium, two contained potassium, four contained sodium, and three contained carbonates. Eight of the nine compounds had a basic pH which confirms earlier hypotheses that alkaline compounds appear to have a greater detrimental effect on pollen preservation than do acidic reagents.

Biological agents such as fungi and bacteria can also cause degradation of pollen grains deposited in archeological sites. Some of these micro-organisms are thought to feed on the internal cytoplasm of pollen grains and thus contribute to the eventual destruction of the pollen by weakening the outer wall while attempting to penetrate the pollen grains. Fungi, such as the Phycomycetes, were investigated by Goldstein (1960) and Holloway (1981) to determine if they were a causative factor in the destruction of certain pollen types. Data from both studies revealed that certain genera of aquatic and soil fungi are selective in their preference since they tend to infest certain pollen types at a faster rate than others.

Based upon the analysis of the soil chemical data from these sites it is likely that the environment of preservation was not conducive to pollen preservation. In general, when the soil pH is above neutral and the percentage of organic matter falls below 1%, the prognosis for recovery of intact pollen assemblages is extremely low. In this case, in addition to the above conditions, the salinity and the concentration of calcium were both moderate to high which led to a severe alteration of the pollen assemblage.

Since the number of Lycopodium spores present in the preparation were quite numerous, it is extremely unlikely that loss of the pollen occurred during laboratory extraction. Given the environment of deposition, it is quite likely that pollen deterioration had occurred very shortly after deposition.

Environmental History

The environmental history of the study area can be determined by reference to the research literature and from recent cores collected from Big Lake at the eastern boundary of the study area. At the time of deposition of the braided stream terrace sediments, between 31,000 and 17,000 years BP, full

glacial climatic conditions prevailed (Delcourt et al. 1980). At this time, boreal forest tree species, including white spruce and larch were dominant in the Mississippi River Valley as well as the valleys of the tributary streams (Delcourt and Delcourt 1977, 1985; Delcourt et al. 1980).

A major climatic warming trend occurred between 17,000 and 16,500 years BP which resulted in a significant northward movement of the Wisconsin ice sheet (Delcourt and Delcourt 1984, 1985; Delcourt et al. 1980). At this time there was an expansion of oak and hickory in upland locations and spruce and fir in the river valleys of the central and southeast parts of the United States. Warm, temperate deciduous trees such as gum, chestnut, and bayberry migrated northward (Delcourt et al. 1980). At approximately 12,500 years BP there was a major change from predominately boreal forest plant communities to temperate deciduous plant communities (Delcourt and Delcourt 1979, 1985; King and Allen 1977). Oak and hickory expanded substantially in their extent at this time, and boreal species declined substantially due to the ameliorating climate.

In the early Holocene (12,500-8,500 BP) there was a rapid movement of deciduous mid-latitude tree species into the southeastern United States. Included in this new plant community were hornbeam, oak, hickory, elm, and ash (Delcourt and Delcourt 1985). By 10,000 BP pine and spruce were replaced by deciduous forests dominated by white pine, hemlock, and beech (Whitehead 1981). In the immediate study area of this project, a core from Big Lake reveals pollen characteristic of bottomland arboreal species which were associated with swampy environments (Scott and Aasen 1987)

During the middle Holocene (8,500-4,000 BP), a period known as the hypisthermal, there was a pronounced climate drying and warming. At this time there was a general easterly expansion of prairies at the expense of forest (Delcourt and Delcourt 1985). During this time the modern floristic assemblages of the region developed (Cummings 1987), and mesic forests became xeric forests. In the Big Lake core, pollen assemblages are a mixture of bottomland, arboreal species and upland forests. The upland forests apparently expanded at this time in response to the drier conditions (Guccione 1987).

For the last 5,000 years in the southeast United States there has been an increase in the precipitation and associated return of widespread swamp vegetation (Delcourt et al. 1980; King and Allen 1977). Regionally, oak-hickory forests were replaced by southern pine (Delcourt 1980; Watts 1969, 1975; Watts and Stuive (1980; Davis 1983). Between 3,000 or 4,700 and 2,700 and 2,400 years BP the pollen record from the Big Lake core reflects a swampy habitat, with only restricted areas of bottomland arboreal habitat (Guccione 1987).

Beginning 2,700 or 2,400 years ago there appears to have been a slight climatic warming and/or drying. At this time, the bottomland arboreal species again appear in the pollen record from Big Lake (Guccione 1987). This shift presumably is a reflection of a reduction in the number and size of the swamps in the bottomlands.

Within the last 2,000 years there is increasing evidence of the influence of man on the landscape preserved in the pollen record. Delcourt and Delcourt (1985) report the appearance of cultigens such as gourd, squash, beans, and maize. Much more recently, enhanced abundances of charcoal appear, suggesting increased use of fire for cooking food and for clearing land. A pollen core from Big Lake investigated by King (1978), reveals a history of land clearing and/or lumbering in the region over the past 180 years. This history is reflected primarily in the initial decline of oak, followed by pine, ash, elm, hickory, sweet gum, and sycamore. This depletion is accompanied by a marked increase in willow, which may reflect a relative increase associated with the decline of deciduous tree abundances (King 1978).

Geomorphic History

The geomorphic setting of the study area is the relict braided stream terraces of the eastern lowlands of Arkansas. The terraces consist primarily of braided stream sediments which are mantled in places by channel fill, natural levee, and backswamp deposits. Sediments of the braided stream terraces were derived from the Mississippi River when it occupied a more westerly location than at present. Traversing the braided stream terraces, and oriented in a NE-SW direction, are abandoned braided stream channels (Figure 71) which have become infilled with fine grained fluvial sediments.

The braided stream deposits are the oldest deposits in the study area. However the absolute age of the deposits has until now been unknown. These deposits are associated with high energy environments which are usually not conducive to the preservation of C-14 datable material. Despite the lack of absolute age control some idea of age has been estimated. Guccione (1987) suggests that the braided stream surface is between 25,700 - 12,500 years BP on the basis of the basal age of the oldest (Peoria) loess in the Mississippi Valley. Radiocarbon dates from Big Lake, Arkansas (Guccione 1987) suggest that the sediment is older than 9000 years BP. Radiocarbon dating of charcoal from buried braided stream deposits in Poinsett County (Dixon 1987) provides a date of 31,250 $\pm$ 840 BP.

Natural levee deposits are the next youngest deposit in the study area. The most extensive area of natural levee deposits is immediately west of Big Lake and is associated with deposition along the Right Hand Chute of Little River and possibly that of the abandoned channel immediately west of Big Lake.

The age of the natural levee deposits has been well established from C-14 dating at the Zebree archeological site just to the north of the study area. The natural levee deposits of the little River at Zebree have been dated between 1295 ± 74-1157 ± 70 years BP and 1176 ± 80-910 ± 68 years BP (Lafferty et al. 1987). North of the Zebree site cultural material of 1200-2000 years BP have been obtained (Lafferty et al. 1987). Radiocarbon dates and associated artifacts suggest that the natural levee deposits are between 2,000 and 900 years old.

The channel fills in the abandoned braided river channels are clearly younger than the channels in which they occur and also younger than the natural levee deposits. No absolute ages are available for the channel fills, however Guccione (1987) has suggested an age of <180 years based on a C-14 date obtained by King (1980) from similar sediment in nearby Big Lake. These sediments, which are fine grained and reduced, are associated with the deposition of sediment by slackwater streams which occupied the abandoned braided stream channels.

Backswamp sediments, characteristically associated with meandering stream channels, were not found in any of the test units or backhoe trenches sampled in this study. However, Arkansas Department of Highway's cores in the southern part of the study area adjacent to the Right Hand Chute of Little River do contain backswamp deposits.

In summary, the geomorphological evolution of the study area is apparently as follows. The braided stream deposits which dominate the study area were deposited by the ancestral Mississippi River in the late Pleistocene beginning about 36,000 years ago and continuing up to between 12,500 to 9,000 years BP. Between 9,000 and 12,500 years ago the Mississippi River changed from a braided regime to a meandering one. Shortly after 9,000 years ago the Mississippi began to deposit large amounts of vertical and lateral accretion deposits as it began meandering and moved to the eastern part of its valley. As the river migrated, the western part of the valley was influenced less and less by the Mississippi. As this occurred, the western part of the valley became more influenced by the Right Hand Chute of Little River. Little River deposited considerable amounts of natural levee sediments, most of which appear to have been deposited between 5,400 and 900 BP (Guccione 1987). Most recently, deposition in the study area appears to have been the deposition of channel fill deposits in the abandoned braided stream channels.

ARCHEOLOGICAL SIGNIFICANCE

Sediment samples were collected from selected archeological test units and from sediments exposed in backhoe trenches in the study area. Samples were collected in such a way as to determine the nature of the geomorphic environment in which archeological sites are located and from this attempt to predict the most likely landscape settings in which buried archeological sites might be likely to occur. Archeological sites have been found in considerable numbers in all of the major geomorphic environments present in the study area (Figure 71).

Many archeological sites are associated with natural levees. This is especially noticeable on the western side of Big Lake (Right Hand Chute of Little River complex in Figure 71). In this geomorphic setting stratified buried archeological sites are likely to be found. This geomorphic setting is relatively dry, and is also close to food and water resources. Further, it is the site of frequent deposition as the adjacent rivers overtop their banks during flood events. As this occurs archeological materials are likely to be buried by newly added sediment. In the study area, natural levee sedimentation occurred from 5,400 years BP until at least 1,000 years BP (Guccione 1987) so there is a long time period throughout which burial may have occurred. Sediments indicative of this geomorphic environment were identified at site 42. Similar conclusions on the origin of the sediment west of Big Lake were reached independently by Guccione (1987) from sampling she conducted near Manila, Arkansas.

The other geomorphic environment in which buried archeological sites occur is in the infilled braided stream channels. Buried sites occur at or near the contact between the braided channel sediment and the finer grained channel fill. Buried sites within the fill itself are unlikely because of the young age of that sediment. Sediments characteristic of this geomorphic setting are observed and described from Backhoe Trenches 1 and 2 and sites 32, 33, 34, 35, 55, and 64. However, no archeological materials were found in sediments exposed in the two trenches.

Because of the great age of the braided stream terrace deposits, it is unlikely that buried sites occur in the depcsits of this geomorphic environment. Archeological sites are going to be restricted to the surface of the braided stream terraces, but may be buried by younger surface sediments. The extent of the braided stream surfaces was elucidated from pre-existing maps and various cores previously collected from the study area (cores GS20, GS26, AHD 12, AHD 16 in Figure 71).

Arkansas Highway Department cores (AHD 13 and AHD 14 in Figure 71) in the southeastern part of the study area reveal backswamp deposits adjacent to the Right Hand Chute of Little River. However, none of these deposits appears in the area specifically investigated in this present study. All of the sites along the ditch south of Big Lake are on braided stream deposits. It is, however, likely that archeological sites in the backswamp area of the Right Hand Chute of Little River possess a buried component.

Chapter 9

PROJECT SUMMARY AND RESULTS

by

Carol S. Spears

INTRODUCTION

The significance or insignificance of cultural resources recorded and investigated during the project is discussed according to the six sections outlined in this study: (1) Prehistoric Sites Recommended for Testing, (2) Buried Sites Recommended for Testing, (3) Isolated Finds, (4) Redeposited and Plowzone Sites, (5) Sites Located Outside the Project Area, and (6) Historic Sites. Detailed information on each specific site was presented in Chapter 7. In order to condense this information, site specific data is presented in summary tables and significance and recommendations are discussed in general terms. Following the cultural resource management concerns, other project results are described.

PREHISTORIC SITES RECOMMENDED FOR TESTING

Significance

Eighteen prehistoric sites are summarized in this category (Table 69). Of these, 12 sites had intact middens, stratified deposits, and excellent integrity. In SPEARS opinion, these sites are eligible for nomination to the National Register with regard to Criterion D which states "that they have yielded or may be likely to yield information important in prehistory or history". Insufficient data was collected at an additional six sites to determine significance. Testing is necessary at these locations in order to properly evaluate their eligibility.

As shown in Table 69, all sites except three were multicomponent and most date to the Late Woodland and Early or Middle Mississippian periods. These sites have a high research potential because the middens, stratigraphy, and features may contain information relative to our knowledge of settlement patterns, seasonality, subsistence, social systems, ceramic and lithic technology, duration of settlement, spatial patterning of the site, chronology, and geomorphology of the area. A sample of research topics which could be investigated at these sites is presented.

Table 69. Summary of Prehistoric Sites Recommended for Testing.

ABBREVIATIONS USED: CULT AFFIL=Cultural Affiliations; W=Woodland; M=Mississippian; H=Historic; DOC=Documented; P=Probably Present; STRAT=Stratified Deposits; RD=Routon-Dundee-Crevasse Complex; DU=Dundee Silt Loam; ST=Steele Tunica Soils; DV=Dundee Dubbs Crevasse Complex; LB=Iberia Clay; HA=Hayti Fine Sandy Loam; TD=Tiptonville & Dubbs Silt Loam; BT/CF=Braided Stream Terrace and Channel Fill; NL=Natural Levee; NRHP=National Register of Historic Places; E=Eligible to NRHP; NE=Not Eligible to NRHP; NAT=Needs Additional Testing to Determine Significance; FW=Fieldwork Recommended; NFW=No Further Work Recommended.

	CULT	MIDDEN		STRAT		FEA		SOIL	LAND	NRHP			RECOMMENDATIONS		
SITE	AFFIL	DOC	P	DOC	P	DOC	P		FORM	E	NE	NAT	AVOID	FW	NFW
3MS41	WMH	X		X		X		RD	BT/CF	X			X	X	
3MS93	WM	X		X		X		DU	BT/CF	X			X	X	
3MS493	WM	X		X			X	RD	BT/CF	X			X	X	
3MS494	WM	X			X		X	ST	BT/CF	X			X	X	
3MS497	WM	X		X			X	RD	BT/CF	X			X	X	
3MS498	WMH	X		X		X		RD	NL	X			X	X	
3MS501	W	X			X		X	DV	NL			X	X	X	
3MS502	WM	X		X			X	DV	NL	X			X	X	
3MS503	W		X		X		X	RD	NL			X		X	
3MS504	WM		X		X		X	ST/LB	BT/CF			X		X	
3MS505	AWM		X		X		X	RD	BT/CF			X		X	
3MS506	WM	X		X		X		ST	BT/CF	X			X	X	
3MS507	WM		X		X		X	RD	NL			X		X	
3PO499	WM	X		X		X		HA	BT/CF	X			X	X	
3PO500	WM	X		X			X	HA	BT/CF	X			X	X	
3PO501	WM	X			X		X	HA	BT/CF	X			X	X	
3PO502	WM		X		X		X	HA	BT/CF			X		X	
3CG915	W	X			X		X	TD	NL/CF	X			X	X	

Mississippian

Late Mississippian populations were nucleated in large villages and "large areas of northeast Arkansas were unoccupied" (Morse 1982b:NE14). The only evidence for the Late Mississippian period found in this project area is one small shell tempered red on white slipped sherd collected from the surface of 3MS41. In addition, Morse's notes attached to the 3MS93 state site form indicate that 3MS93 may have a Late Mississippian component. Late Mississippian sites were not identified in the Ditch 29 project (Lafferty et al. 1987). The Ditch 29 project joins the north end of the Ditches 7, 13, and Buffalo Creek Ditch project area. The lack of Late Mississippian villages between Big Lake and Buffalo Creek Ditch provides supporting data for Morse's hypothesis.

The few thin undecorated shell tempered sherds and several lithic artifacts found at sites in the project area indicate possible Middle Mississippian components. In this region, sites dating to this time period are usually Cherry Valley phase. Documenting Cherry Valley phase sites and conducting further investigations would add significantly to our understanding of the Middle Mississippian period in northeastern Arkansas.

The Early Mississippian components, as recognized by red filmed ceramics, sand/shell tempered sherds, and lithic artifacts, were identified at many sites in the project area; aboriginal pit features and one burial were also documented. In this area, the Early Mississippian manifestation is considered to be the Big Lake phase which was defined by Morse from investigations at the Zebree Site (Morse and Morse 1980, 1983).

Woodland

The Late Woodland is identified in this vicinity by a ceramic assemblage composed predominantly of Barnes sand tempered cordmarked and plain ceramics. The majority of sites identified dated to this period and 11 of these contained well-developed middens.

In the one quarter mile wide transect surveyed for about 15 miles between the Little River and the St. Francis River, less than half of the Late Woodland period sites had Mississippian components (Morse and Morse 1983:183). From this data, Morse hypothesized that the Baytown period sites were distributed differently from the Mississippian sites. It was further hypothesized that Baytown villages were not located on or adjacent to soils considered the best for gardening. Sites were classified as dispersed seasonal occupations with no regard to planned habitation areas and they lacked substantial midden development. Middens have likewise not been found at Dunklin phase sites in the Malden Plain of Missouri and "virtually the entire archaeological record of this phase lies in the modern plowzone" (Dunnell and Feathers 1986:3). A lack of sedimentation on top of archeological deposits has meant that shallow sites are vulnerable and easily destroyed by agricultural practices. Mississippian sites differ from Late Woodland sites in that large permanent villages are often located on the best agricultural soils. Mississippian people lived in planned communities; and well developed middens are common.

Information collected in this project challenges the above hypotheses. In this study, a high percentage of sites (89%) have both Late Woodland and Early Mississippian components (Table 69). In addition, the Late Woodland period artifacts were not just confined to the plowzone, but intact middens, some of which were deeply stratified (3MS498) were found. The thicknesses of the middens indicate the possibility of either dense populations for a short amount of time, permanent year round habitation, or repetitive seasonal occupation of the exact same locations. The

majority of significant or potentially significant sites in this study (15) were located on the best soils (Table 69). Field observations of the soils at the three sites mapped on clays (3MS494, 3MS504, 3MS506), indicates that they may be incorrectly labeled. The Late Woodland occupations were also located on similar landforms. Twelve sites were found at the contact of the braided stream terrace and braided stream channel fills; five sites were found on natural levee deposits; and one site was positioned at the contact of a natural levee and a channel fill. The three single component Woodland sites (3MS501, 3MS503, 3CG915) are mapped on a natural levee.

Many of the Woodland middens contain charcoal. Although there was an insufficient amount collected in these limited tests to justify processing, with additional testing adequate quantities of datable organic material from good contexts could be recovered. Sites containing cultural strata with charcoal or other datable items are almost always significant and eligible for nomination to the National Register.

Subsistence information from the Dunklin phase has been minimal. No cultigens have been identified (Morse and Morse 1983:186) and few wild plant species have been found. Botanical remains at the Zebree site indicated that maize was a staple in the diet during the Big Lake Phase (Morse 1980). Recent carbon isotope fractionation studies (Lynott et al. 1986; Dunnell and Feathers 1986:18) on Big Lake skeletal samples, demonstrate that domesticated plants were not staples in the diet. This study supports that there is a greater similarity between Dunklin and Big Lake phase subsistence strategies. Other similarities are discussed later in this section. Some of the Barnes middens investigated in this study contained carbonized floral and burned and unburned animal bone. With the proper recovery techniques and specialized analyses, information on subsistence should be obtainable from these middens.

The Zebree site, located near Big Lake, contains a Dunklin phase and Mississippian occupations. Interpretations of the stratigraphy and other site data led to a hypothesis that the initial Mississippian occupants had moved onto a Baytown seasonal village, portions of which were still in use (Morse and Morse 1983). In our limited tests conducted during the present study, there was little evidence to support this rather abrupt change. Most of our sites had a slight mixing of artifacts from both periods in the upper intact stratum. A more distinct mixing of Late Woodland and Mississippian artifacts was also described in tests conducted by Iroquois Research Institute (1978, 1979, 1980b); however, the mixing may have been a result of unidentified intrusive features. In all but one site recorded and investigated by Mid-Continental Research Associates (Lafferty et al. 1987) the same mixing of periods occurs in the upper portion of the midden.

Morse has also hypothesized that beyond Zebree towards the north, south, and west are farmsteads, hamlets, and small villages, all smaller settlements than Zebree (Morse and Morse 1983:232). In the present study, site size was determined only by the extent of surface material. The artifacts on the surface were generally small and confined; however, limited subsurface tests at several sites indicated that intact Barnes middens existed below the surface and had not been disturbed by plowing. It was shown that the distribution of surface material was not always correlated with the location of the intact deposits (3CG915) and that the middens extend under the spoil for great distances, even to the other side of the ditch (3MS497, 3PO499, 3PO500, 3PO501, 3MS41, 3PO497, 3PO498). An accurate estimate of site size for sites found in this project can only be made after additional subsurface tests have documented the extent of the intact deposits. Evidence from the present study also shows that fairly large villages dating from the Woodland to Mississippian periods are not just confined to the western margin of Big Lake and the levee associated with Little River. They are also found in the sediments on top of the braided stream surface, especially adjacent to the stream fills. As shown, it is common for sites to be partially or completely buried by alluvial sediments deposited after aboriginal occupation.

Dunnell and Feathers (1986:16) have also disagreed with Morse's settlement theory. They conclude that Dunklin and Big Lake phase sites have the same distribution. Furthermore, they do not know of any late Barnes settlements which do not also have Big Lake phases. In SPEARS study, three Dunklin phase sites (3MS501, 3MS503, and 3CG915) described in this sample of significant and potentially significant sites, do not contain artifacts dating to the Mississippian periods. However, this may be due to the limited sample size of artifacts.

The human skeletal remains positively identified at 3MS41, and likely to be found at other sites, indicate that information about prehistoric biology can be obtained from some of these significant cultural resources. Burials, burial goods, and other factors may lead to inference about population demography, population density, physical characteristics of the inhabitants, diet, disease, trauma, and quality of life. Recent advances in protein research and extraction from bone samples have resulted in identifying substances which can be used to trace kinship and even tribal affiliation. Special handling procedures, including immediately freezing samples upon exposure, must be followed for this technique to be successful. Although SPEARS is fully aware of the values of studying prehistoric human skeletal remains, cemeteries are sacred areas regardless of race or religion and they should be protected, preserved, and avoided by public and private projects.

Ceramic technologies and the distribution of Barnes and Baytown pottery are continually being discussed, studied and reassessed. In addition, the distribution of plain and cordmarked pottery found on the surface of Barnes sites and in

the intact middens show inverse relationships. Fewer cordmarked sherds are found on the surface and more are collected with increasing depth in test units. More plain sherds are found on the surface and decrease in frequency with depth in the test units. These inverse relationships were also recognized at sites found in the Ditch 29 Project (Lafferty et al. 1987). Likewise, a higher percentage of red-filmed sherds were found in subsurface tests than collected on the surface in the present study. Explanations which could be related to the durability of sherd designs and decorations, or to temporal, functional or discard pattern differences need to be addressed.

Slight variations in temper, vessel form, decoration, base and rim shapes in the seemingly similar Barnes ceramic assemblage have been recently brought to our attention (Dunnell and Feathers 1986). They have found that variations are non-randomly distributed and differences in assemblages may be a result of site location, chronology and/or function (Dunnell and Feathers 1986:4). For example, decorations on sand tempered pottery are considered early while a "decorative" cordmarking is considered a late trait. However, the transition from sand to shell tempering is considered to be a radical shift in technology. For instance, sand tempered pots are almost always large jars which are unslipped and cordmarked. The earliest shell tempered vessels are slipped, plain (not decorated), jars, but also can be bowls, funnels, and pans. Transitional wares have a combination of sand/shell paste. Other similarities are noticed between sand and shell technologies such as firing in oxidizing conditions and vessel forms which occur in the same proportions. These common traits suggest that shell tempering is derived directly from Barnes tempering. This theory is further supported by the evidence of slipped sand tempered sherds such as those found in the current study (3CG914, 3MS41).

According to a recent study (Dunnell and Feathers 1986), firing temperatures and time for the two technologies differ radically. Sand tempered pots are fired for longer periods of time at higher temperatures. Shell tempered vessel are fired for shorter periods and at lower temperatures. The latter technology is more efficient in terms of time and fuel costs and may account for the expedient shift from sand tempering to shell tempering as observed in the archeological record.

Durability is also different between vessels of the two temper types. Shell tempered pots are stronger and the paste allows for more diversified forms. Slipping can be interpreted as functional since shell tempered vessels are more porous without slipping. The implications of these factors could result in new interpretation of the settlement pattern at Zebree, a redefinition of the Big Lake phase as the latest Late Woodland manifestation, and acceptance of the possibility that the Big Lake phase replaced the Dunklin phase in more a gradual manner. Sites identified in the present study as eligible for nomination to the National Register contain information on the emergence of Mississippian culture.

As stated above, decorations on sand tempered pottery are considered as temporal markers for the Early Woodland period which in this region is considered Tchula phase. One check-stamped sherd each was collected from 3MS41, 3MS493, and 3MS504. Site 3MS504 also contained a nail punctated sherd, a sherd with a white slipped interior, and one with a black slipped interior. Lithics and burned clay objects which may date to this period were also found at sites in the project area. Little information has been collected in northeast Arkansas relative to the Early Woodland period.

The lithic assemblage, including one side notched projectile point, indicated that 3MS505 dates to the Late Archaic and may be earlier. Its location is west of Buffalo Creek Ditch where sediments are older than the more recent alluvial deposits to the east. In the Little River drainage, soils are not considered old enough to contain Archaic sites (Price and Price 1980). The Archaic components at 3MS505 could be compared to other Archaic sites such as 3MS482 and 3MS519, the only other Archaic manifestations found during this project. These sites are also located near Buffalo Creek Ditch.

Results of the geomorphic and pollen studies conducted as part of this project, the Ditch 29 study (Guccione 1987; Scott and Aasen 1987), and the Ditch 1 study (Dixon 1987; Cummings 1987), show that settlement patterns of the periods represented are tied to the landforms and their age. Topics which continue to be addressed are the criteria for site selection, site function as it related to location, seasons of occupations, and age of deposits. Reconstruction of the environment at the time of occupation, the available floral resources, and fluctuations in the climate such as the hypisthermal indicated in cores from Big Lake (Scott and Aasen 1987) and from the St. Francis Sunken Lands (Cummings 1987) are topics for continued research. The existence of buried deposits brings more attention to the probability for other buried sites. With this knowledge field techniques can be developed which facilitate their discovery. Understanding the processes and locations of buried landforms should lead to refined predictive statements and models.

Recommendations

The 12 sites described in this section which are eligible for nomination to the National Register should be avoided by the proposed project. In some instances, deposits probably extend toward the ditch and lie under the spoil. At these locations, deep subsurface testing is necessary to establish more accurate boundaries of the intact buried anthropic strata so that important cultural resources are not disturbed during ditch cleaning. This type of testing program should result in adequate information necessary to complete the National Register form.

In instances where avoidance is not feasible, then additional testing is required to gather sufficient information to document the site on the National Register form. Data is also needed to develop a mitigation plan for that portion which will be impacted.

Further testing is necessary at the potentially eligible sites to evaluate them for their significance. Testing methods should involve a variety of techniques including: controlled excavations, removal of the plowzone from large areas to find truncated features, backhoe or deep subsurface tests to examine for more deeply buried deposits, and controlled columns to identify site boundaries. For those sites found to be eligible, the data collected can be used to complete the National Register nomination form and to devise a data recovery plan for portions of the site which may be adversely impacted.

BURIED SITES RECOMMENDED FOR TESTING

As defined earlier, when a cluster of artifacts was found only on the spoil, the site was considered buried. The success of locating the actual intact deposits is often directly related to the density of artifacts observed on the spoil. C. Spears has documented this relationship at sites in the Tyronza River area (Lafferty et al. 1984, 1985). For sites summarized here, the spoil contains sufficient frequencies of cultural material spread over sizable areas that the intact deposits should be easily found (Table 70). Deep subsurface testing should include backhoe trenches and bank profiles at buried sites in order to determine the nature of the deposits, their significance, site boundaries, and the effect the proposed project will have on these resources.

Information on the individual buried sites is presented in Table 70. Several general comments can be made about this sample. The soils, as mapped by the Soil Conservation Service, show a wide variety of types and differing landforms are represented. Nine sites are located at the contact of the braided stream terrace and the channel fills; and one site is found at the contact of a braided stream channel fill and another, apparently older, channel fill. Two sites are found on the braided terrace which are buried by the veneer of later sediments or are positioned beneath channel fills. Research problems which could be addressed at these sites are the same as those discussed in the previous section (Sites Recommended for Testing).

Table 70. Summary of Buried Sites Recommended for Testing.

ABBREVIATIONS USED: CULT AFFIL= Cultural Affiliation; PROF=Profile; TU=Test Unit; W=Woodland; M=Mississippian; A=Archaic; RD=Routon-Dundee-Crevasse Complex; DU=Dundee Silt Loam; ST=Steele Tunica Soils; ; HA=Hayti Fine Sandy Loam; JE=Jeanerette Silt Loam; SM=Sharkey-Crevasse Complex; MO=Mhoon Silty Loam; BT/CF=Braided Stream Terrace and Channel Fill; NL=Natural Levee; NRHP=National Register of Historic Places; NAT=Needs Additional Testing to Determine Significance; RECOM=Recommendations; FW=Fieldwork Recommended.

SITE	CULT AFFIL	BANK PROF	TU	LENGTH ON SPOIL	ARTIFACT COUNTS	RELATED TO	SOIL	LAND FORM	NRHP NAT	RECOM FW
3MS479	WM			225 m	35		ST	BT/CF	X	X
3MS480	W			50 m	31		RD	BT/CF	X	X
3MS481	W	X		50 m	10		DU	BT	X	X
3MS482	A?W			45 m	52		RD	BT/CF	X	X
3MS483	W			40 m	55		SM	BT	X	X
3MS484	?		X	16 m	6		ST	BT/CF	X	X
3MS485	W		X	60 m	41		ST	BT/CF	X	X
3MS486	W	X		35 m	3		JE	CF/CF	X	X
3PO496	WM?			95 m	few	3PO497	HA	CF/BT	X	X
3PO497	WM			75 m	163	3PO496	HA	CF/BT	X	X
3PO498	WM			70 m	60		HA	CF/BT	X	X
3CG914	WM			85 m	66		MO	CF/BT	X	X

ISOLATED FINDS

Fifteen isolated finds were recorded and summary information is presented in Table 71. Five sites were found on top of the ditch spoil which indicates sites may be buried. Finding a buried cultural deposit when only an isolated artifact is observed, is labor intensive and rarely productive. Because single artifacts have very limited research potential, they are not considered eligible for nomination to the National Register. However, they can be important for settlement system studies. The state assigns permanent site numbers to isolated finds which are diagnostic lithic tools. Single sherds are not given numbers but are listed by temporary site numbers. No further work is recommended at the locations of these isolated finds in relation to the proposed project.

Table 71. Summary of Isolated Finds.

ABBREVIATIONS USED: CULT AFIL=Cultural Affiliation; L=Lithic; C=Ceramic; ST=Shovel Tests; W=Woodland; M=Mississippian; RD=Routon-Dundee-Crevasse Complex; DU=Dundee Silt Loam; ST=Steele Tunica Soils; DV=Dundee Dubbs Crevasse Complex; LB=Iberia Clay; BR=Bowdre Silty Clay Loam: MO=Mhoon Silt Loam; SH=Sharkey-Steele Complex; BT/CF=Braided Stream Terrace and Channel Fill; NL=Natural Levee; NRHP=National Register of Historic Places; NE=Not Eligible to NRHP; RECOM=Recommendations; NFW=No Further Work Recommended.

SITE	CULT AFFIL	L	C	ON SPOIL	ST	REVISITS	OUT-SIDE	SOIL	LAND FORM	RELATED TO	NRHP NE	RECOM NFW
3MS510	M	X		X				RD	BT/CF		X	X
3MS511	W	X			X	X		DU	BT		X	X
3MS512	?	X			X			BR	BT		X	X
3MS513	?	X						ST	BT/CF		X	X
3MS514	?	X						ST	BT/CF		X	X
3MS515	W	X		X				RD	CF/BT		X	X
3CG916	?	X					X	MO	CF/BT	3CG914	X	X
3CG917	W	X		X				MO	CF/BT		X	X
SITE 6	W		X			X		RD	BT/CF		X	X
SITE 10	?	X		X				RD	BT		X	X
SITE 46	W		X			X		DV	NL		X	X
SITE 48	W		X			X		DV	NL		X	X
SITE 59	W		X					SH	BT/CF		X	X
SITE 60	W		X					ST	CF/BT		X	X
SITE 63	W	X	X	X				LB	BT/CF		X	X

REDEPOSITED AND PLOWZONE SITES

As previously stated, redeposited sites differ from buried sites in that they are not found on obvious ditch spoil adjacent to a ditch but were located in fields. Sites found in areas which have been significantly disturbed (at the intersections of a levee, bridge or ditch) and plowzone sites are are summarized in Table 72.

Table 72. Summary of Redeposited and Plowzone Sites.

ABBREVIATIONS USED: CULT AFFIL=Cultural Affiliations; W=Woodland; M=Mississippian; L=Lithic; C=Ceramic; PZ=Plowzone; CC=Controlled Column; ST=Shovel Test; TU=Test Unit; RD=Routon-Dundee-Crevasse Complex; DU=Dundee Silt Loam; HA=Hayti Fine Sandy Loam; BR=Bowdre Silty Clay Loam; BT/CF=Braided Stream Terrace and Channel Fill; NL=Natural Levee; NRHP=National Register of Historic Places; NE=Not Eligible to NRHP; RECOM=Recommendations; NFW=No Further Work Recommended.

SITE	CULT AFFIL	L	C	REDE-POSIT	PZ	CC	ST	TU	SOIL	LAND FORM	RELATED TO	NRHP NE	RECOM NFW
3MS492	W	X	X		X	X			DU	BT/CF		X	X
3MS495	W	X	X	X		X			BR	BT/CF		X	X
3MS496	W	X	X	X	X	X		X	DU	BT/CF	3MS497	X	X
3MS497W	WM	X	X	X				X	HA	CF/BT		X	X
3MS499	W		X	?	X		X		RD	NL		X	X
3MS508	W		X	X		X	X		RD	NL		X	X
3MS509	WM		X	X		X	X		RD/DU	NL		X	X

None of the seven sites were found to possess intact deposits or features and they are not considered eligible for nomination to the National Register. No further work is recommended at these locations in relation to the proposed project.

SITES OUTSIDE THE PROJECT BOUNDARY

Surface material on six sites was found inside the project corridor, but testing indicated that subsurface deposits were outside the project area. Four other sites were found while walking to and from transects and were positioned well outside the project. None of the cultural resources have been evaluated according to National Register criteria and no further work is recommended at these locations in relation to the proposed project. Sites found outside the project boundary are listed in Table 73.

Table 73. Summary of Sites Outside the Project Boundary.

ABBREVIATIONS USED: CULT AFFIL=Cultural Affiliation; W=Woodland; M=Mississippian; CC=Controlled Column; ST=Shovel Tests; TU=Test Units; CSC=Controlled Surface Collections: RD=Routon-Dundee-Crevasse Complex; DU=Dundee Silt Loam; ST=Steele Tunica Soils; SM=Sharkey-Crevasse Complex; DV=Dundee Dubbs Crevasse Complex; LB=Iberia Clay; MO=Mhoon Silty Loam; BT/CF=Braided Stream Terrace; and Channel Fill; NL=Natural Levee; BT=Braided Stream Terrace.

SITE	CULT AFFIL	CC	ST	TU	CSC	SOIL	LAND FORM
3MS43	WM	X	X			DU	BT/CF
3MS500	W		X			RD	CF/BT
3MS516	W					DU	BT
3MS517	WM	X				RD	NL
3MS518	WM			X		LB/SM	CF
3MS519	AW					ST	CF
3MS520	W					ST	CF/BT
3MS521	WM					ST	CF
3MS522	WM	X	X			DV	BT/CF
3CG918	WM	X		X	X	MO	CF/BT

HISTORIC SITES

Sixteen historic sites or components were identified in this project. Most of these were twentieth century house sites, some of which are shown on 1941 quadrangle maps. Several sites are trash areas associated with these farmsteads. These sites were not old enough to be considered significant and do not meet other criteria.

The soil types at the historic sites are shown in Table 74. All historic sites except for 3MS504, where the soil is probably mapped incorrectly, are on the better drained soils which would have been the most productive agricultural land.

Three historic sites were found to contain artifacts which date to pre-Civil War periods. Two of these sites, 3MS41 and 3MS498, have significant prehistoric deposits. These sites should be avoided by the proposed project. However, if avoidance is not feasible, further testing to determine boundaries, collect additional information for the National Register form, and to

develop a mitigation plan are recommended. In addition, archival and informant research is required because these early historic housesites are likely to yield information important to history, especially early Western settlement in Mississippi County.

3MS211 is a historic site, due to its antiquity, may be eligible for nomination to the National Register. Additional archival and informant research is recommended for this site. Based on the results of this research, further testing to identify features may be necessary to determine significance. Site 3MS211 is likely to yield important information relative to the early historic settlement adjacent to Big Lake. Combining the history of this site with other early sites located along the natural levee associated with Big Lake should result in an interesting pattern of frontier life and settlement.

Table 74. Summary of Historic Sites.

ABBREVIATIONS USED: CULT AFFIL=Cultural Affiliations; W=Woodland; M=Mississippian; P=Prehistoric; H=Historic; RD=Routon-Dundee-Crevasse Complex; DU=Dundee Silt Loam; ST=Steele Tunica Soils; DV=Dundee Dubbs Crevasse Complex; LB=Iberia Clay; CR=Crevasse Loamy Sand; BR=Bowdre Silty Clay Loam; JE=Jeanerette Silt Loam; AN=Amagon Sandy Loam; NRHP=National Register of Historic Places; E=Eligible to NRHP; NE=Not Eligible to NRHP; NAT=Needs Additional Testing to Determine Significance; FW=Fieldwork Recommended; NFW=No Further Work Recommended.

	CULT	SOIL	NRHP			RECOMMENDATIONS		
SITE	AFFIL		E	NE	NAT	AVOID	FW	NFW
3MS41	WMH	RD	X			X	X	
3MS211	H	DV			X		X	
3MS487	H	DU		X		X		X
3MS488	H	DU		X				X
3MS489	H	CR		X				X
3MS490	H	DU		X				X
3MS491	H	RD		X				X
3MS495	WH	BR		X				X
3MS498	WMH	RD	X			X	X	
3MS502	WMH	DV		X				X
3MS503	WH	RD	X		X			
3MS504	PH	LB/ST		X				X
3MS517	WMH	RD		X				X
SITE 2	H	JE		X				X
SITE 15	H	AN		X				X
SITE 16	H	RD		X				X

SITE DENSITY ESTIMATES

Site density estimates were necessary in order to estimate the number of sites to be found and tested to formulate project costs. The following discussion is taken from SPEARS proposal as submitted to the Corps of Engineers in relation to the project. The site density figures were tested in this project and likewise similar calculation techniques were used in the Ditch 1 project (Spears et al. 1987). In the present ditch survey, 70.5 sites were estimated and 66 sites were found in the project corridor (62 new sites and 4 previously recorded sites). Four sites were found outside the project area. In the Ditch 1 survey, four sites were predicted and four sites were found. In the Ditches 7, 13 and Buffalo Creek Ditch project, it was incorrectly estimated that about 20% of the sites found would be initially tested. In actuality over 50% of the sites found were tested in a limited manner.

Soil types as indications of landform have been shown to be one of the best single variables used for predicting prehistoric sites in northeast Arkansas and the bootheel of Missouri (Brooks et al. 1977; Lafferty et al. 1984; Lafferty et al. 1985; Toney 1977; Price 1978; Price and Price 1980; Klinger et al. 1981; Million 1977; Klinger 1978; Price 1974; Cottier and Waselkov 1974; Harris 1980; Delcourt et al. 1980). In general, the results of these studies correlate soil types in a specific project area with both the cultural affiliation and type of prehistoric site. The best soils for the later prehistoric occupations (Woodland - Mississippian) occur on natural levee sediments near old channels (Lafferty et al. 1985). Also, prehistoric sites are relatively dense on terraces near the edge of the sunk lands or swamps because these high dry locations afforded a good place to exploit the plentiful aquatic, bird, and mammal species year round. The worst soils for prehistoric habitation are those formed from channels, slackwater conditions, or areas which are frequently flooded. Only seasonal occupations or limited activity sites are likely to be found on these soils. However, there is the potential for buried sites in these environments. At 3MS81 investigated by C. Spears, a 50 cm thick Sharkey clay cap was found to cover a silty soil containing a Cherry Valley Phase village (Lafferty et al. 1984). In one ditch exposure, a sand blow was cross-sectioned which geologists attributed to the New Madrid Earthquake in 1811. The clay was interpreted as being deposited in the area before that earthquake.

A brief examination of the soils in the project area in the Mississippi and Craighead Counties (Ferguson and Gray 1971; Ferguson 1979) was conducted prior to writing the SPEARS project proposal. On Ditches 7 and 13, there are a few soils such as Sharkey clays, Steele-Tunica, Bowdre silty clay loam and Tunica silty clay which are associated with slackwater conditions. About nine miles of these soils are present on Ditches 7 and 13 in the project area.

The soils formed on the lower part of natural levees consist of Jeanerette silt loam, Hayti fine sandy loam, Amagon sandy loam, Dundee silt loam, Dundee-Dubbs-Crevasse complex and Tiptonville-Dubbs silt loam. These soils types have a medium probability for containing sites. Approximately 11 linear miles occur in the project area on Ditches 7 and 13.

The best soils for prehistoric occupation are the Crevasse loamy sand and Routon-Dundee-Crevasse Complex. The former is found on the natural levees bordering streams and the latter is found on the middle and lower portions of levees. There is a fairly high probability for sites to be located on these soils which occur along 15 linear miles of Ditches 7 and 13 within the project.

On the Lower Buffalo Creek Ditch, 32 linear miles are associated with slackwater soils including Steele-Tunica soils, Sharkey-Crevasse Complex, Iberia Clay, and Mhoon Fine Sandy Loam. Only about two miles of ditch are associated with soils which have a high probability for prehistoric site location. These include the Routon-Dundee-Crevasse complex. The remainder of the soils are associated with the lower parts of natural levees and have a medium probability for archeological sites. About eight linear miles of these types of soils are mapped.

In order to accurately estimate the time required to conduct the proposed study, the number of sites likely to be recorded was estimated. In addition, the project called for testing of those sites potentially eligible to the National Register; therefore, the number of sites to be tested was also calculated. Several density ratios for the area have been developed. On a transmission corridor survey, Padgett (1978) found 1.8 sites per linear mile in this region. This is a 1:1.8 ratio. In Tyronza I, roughly a 1:1 ratio of ditch miles to sites was evident and in Tyronza II a 1:0.5 ratio was found. The first study included 31 miles of ditch where levee type soils were predominant. The second study covered 59 miles which was located near the sunk lands and the sediments consisted of the types that developed under slackwater conditions (Lafferty et al. 1984, 1985).

Using these three ratios, an estimate for the number of sites within the project area was calculated. The highest ratio, 1:1.8 was applied to the linear miles with the highest probability for containing sites as based on soil types discussed above. For Ditches 7 and 13, about 15 linear miles were considered high probability areas and only two miles on Buffalo Ditch. Therefore, it was predicted that 31 sites were likely to be recorded. A total of 19 linear miles were estimated as medium probabilities and, using the 1:1 ratio, then it was predicted that 19 sites were likely to be found. About 41 miles were considered low probability areas and, applying the low ratio of 1:0.5, then it was predicted that 20.5 sites were likely to be found. The total number of sites estimated for the project area was 70.5.

Prior to the fieldwork for the Ditches 7, 13 and Buffalo Creek Project, a fairly extensive mapping project was undertaken whereby soils falling into the three landform situations were mapped (highlighted in different colors) on copies of 7.5 minute quadrangle maps. These were then used as day maps for the fieldwork. Since visibility over most to the area was good or excellent during the survey phase of the project, having the probability rates of each transect probably did not bias the identification of sites.

At the end of each day, sites were plotted on the project quadrangle maps. After the first few days of survey, it was readily apparent that the contacts of different soil groups were highly correlated with sites. About 66% of these contacts were associated with cultural resources. Figure 81, a modified version of Figure 71, shows the soil contact zones in relation to the prehistoric sites. These contacts are areas where soil groups, which are also defined above as site probability groups, change. These changes are related to landform differences. In most instances, the contacts represent narrow stream channel fills which dissect the braided stream terrace, or in the Buffalo Ditch area, channel fills cut older channel fills. The prehistoric sites adjacent to the channel fills probably date to when these areas contained active steams.

Table 75 is a summary table showing the prehistoric sites and their relationship to each probability unit as defined in this study. This sample does not include six single component historic sites, redeposited sites, or the four sites found outside the project.

Table 75. Summary of Sites Found Correlated with Probability Units (Counts and Relative Frequencies).

	LOW	MEDIUM	HIGH	CONTACT	TOTAL
COUNT	12	17	9	16	54
FREQUENCY	22%	31%	17%	30%	100%

Sites were also correlated with specific soil types as mapped by the Soil Conservation Service. The number of sites found on soil types and their relative frequencies are shown in Table 76. Collapsing the soils into the low, medium, and high predicting groups, 32.9% of the low probability soils had sites, 40.9 % of the medium probability soils had sites, and 26.2% of the high probability soils had sites. The predictions do not highly correlate with sites, except in a general sense, probably

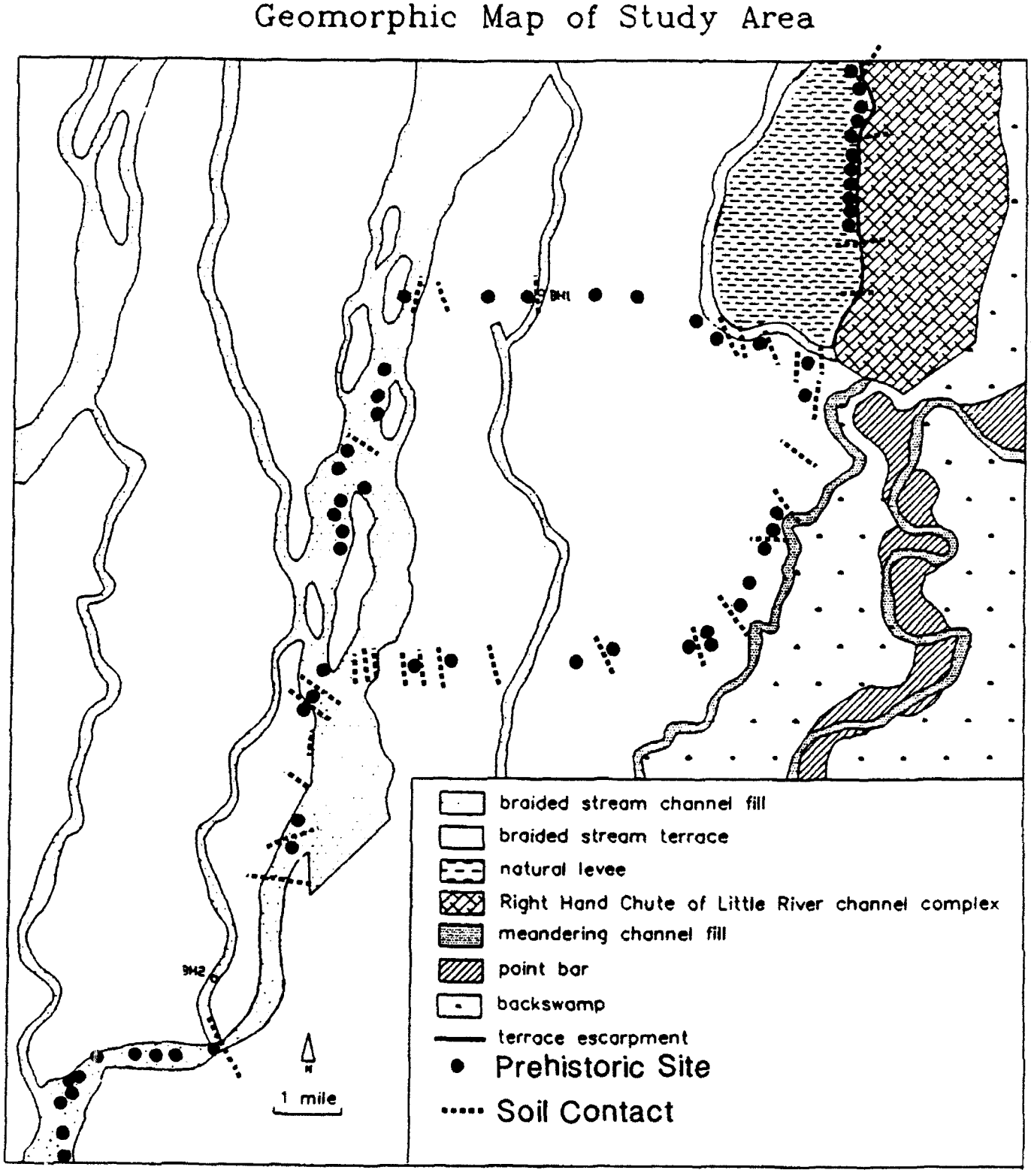


Figure 81. Geomorphic Map of the Study Area Showing Soil Contacts (adapted from Figure 71).

due to soil contacts being better predictors, errors in the soils that are mapped, and surface sediments masking landforms (buried sites are included in this sample).

Table 76. Correlation of Soil Types With Prehistoric Sites (Counts and Frequencies).

ABBREVIATIONS USED: LB=Iberia Clay; ST=Steele Tunica; SH=Sharkey Steele Complex; SM=Sharkey Crevasse Complex; BR=Bowdre Silty Clay Loam; JE=Jeanerette Silt Loam; HA=Hayti Fine Sandy Loam; DU=Dundee Silt Loam; DV=Dundee Dubbs Crevasse Complex; TD=Tiptonville and Dubbs Silt Loam; MO=Mhoon Silty Loam: RD=Routon-Dundee-Crevasse Complex.

	LOW					MEDIUM				HIGH		
	LB	ST	SH	SM	BR	JE	HA	DU	DV	TD	MO	RD	TOTAL
CT	3	12	1	2	2	1	8	6	5	1	4	16	61
%	4.9	19.8	1.6	3.3	3.3	1.6	13.1	9.8	8.2	1.6	6.6	26	100

THE TYPICAL BARNES MIDDEN

Twelve test units excavated at 11 sites along Ditches 7, 13 and Lower Buffalo Creek Ditch and five test units excavated at four sites in the Ditch 29 study (Lafferty et al. 1987) contained intact cultural deposits dating to the Dunklin phase of the Late Woodland period. In this section these cultural deposits are designated as Barnes middens. The test units were examined and comparisons are made (Table 77).

Similarities in the entire sample of test units and sites with intact middens were observed. All except for three sites had Early Mississippian components in the plowzone. In at least two units, Early Mississippian pit features intruded the Barnes midden (3MS498) (3MS119 in Lafferty et al. 1987:33). The sizes and densities of the Barnes sherds increased dramatically below the plowzone. The frequency of cordmarked sherds was higher in the intact cultural strata than on the surface and the frequency of plain sherds was higher on the surface than in the midden. Middens contained burned clay which was well fired and in situ; and samples could be obtained for archeomagnetic dating (Lafferty et al. 1987:B-45). Carbonized organic debris which could also be dated or analyzed for subsistence was present. Burned clay objects were collected which either indicate an Early Woodland component or that burned clay objects continued to be manufactured into the Middle and Late Woodland periods. Similarities in the Barnes middens were also observed between

sites found in: (1) the natural levees associated with Big Lake, (2) the fill above the braided stream terrace, and (3) adjacent to Buffalo Creek Ditch.

Table 77. Summary of Barnes Middens.

ABBREVIATIONS USED: *=Sites found in the Ditch 29 Project (Lafferty et al. 1987); M=Mottled Sediments; SALO=Sandy Loam; SILO=Silty Loam; SI=Silt; SASI=Sandy Silt; FISA=Fine Sand; SISA=Silty Sand; RD=Routon-Dundee-Crevasse Complex; DU=Dundee Silt Loam; ST=Steele-Tunica Soils; DV=Dundee Dubbs Crevasse Complex; HA=Hayti Fine Sandy Loam; TD=Tiptonville & Dubbs Silt Loam; NL=Natural Levee; BT/CF=Braided Stream Terrace/Channel Fill; BCD=Buffalo Creek Ditch.

	SITE	COLOR	M	TEXTURE	BEGIN DEPTH cm	END DEPTH cm	THICKNESS cm	MIDDEN BELOW	SOIL	LAND FORM
B	3MS498	10YR4/3		SALO	25	60	35	X	RD	NL
I	3MS501	10YR3/3		SALO	30	37	7	?	DV	NL
G	3MS502	10YR4/3		SILO	30	50+	20+	?	DV	NL
	*3MS199	10YR5/4	X	SI	25	54	29	X	DU	NL
L	*3MS471	10YR3/2	X	SASI	25	45	20		DU	NL
A	*3MS119	10YR3/2		SILO	29	50	21	?	DU	NL
K	*3MS21(1)	10YR4/3	X	SA	25	35	10	X	RD	NL?
E	*3MS21(2)	7.5YR4/2	X	SI	45	100	55	X	RD	NL?
B	3MS493	10YR3/3	X	SISA	12	25	13		RD	BT/CF
T	3MS494	10YR4/2	X	SISA	35	50+	15+		ST	BT/CF
B	3MS506	10YR3/3	X	SALO	20	55	35		ST	CF/BT
C	3MS497	10YR5/3	X	SALO	20	35	15		RD	CF/BT
D	3CG915	10YR4/1	X	SALO	20	40	20		TD	BT/CF
	3PO501(1)	?		SILO	35	70	35		HA	CF/BT
	3PO501(2)	10YR4/1	X	SALO	30	50	20		HA	CF/BT
	3PO500	10YR5/3	X	SALO	20	40	20		HA	CF/BT
	3PO499	10YR3/2	X	FISA	39	75	38		HA	CF/BT

The Big Lake Barnes Middens

The Big Lake Barnes middens occur on the natural levee areas mapped as Dundee Silt Loam, Dundee-Dubbs-Crevasse Complex and Routon-Dundee-Crevasse complex soils. The intact sediments are typically brown, dark brown, yellowish brown or very dark grayish brown and most sediments are mottled. Textures include sandy

loams, sandy silts, sand, silt and silty loam. The depths of the middens start between 25-45 cm below the surface with an average beginning depth of 29 cm. They end somewhere between 37-100 cm and as an average are 54 cm deep. The thicknesses are 7-55 cm with an average thickness of 25 cm. Almost half of the units in this vicinity have sterile soils below the midden but then have additional thin lenses of midden which are 5-10 cm thick. These lenses are separated by sterile sands which could be interpreted as flooding episodes. Site 3MS498 has a deep, stratified profile similar to Site 3MS199 which was found to the north in the Ditch 29 Project (Lafferty et al. 1987). This group of sites associated with Big Lake all have historic components, many of which date to the pre-Civil War period.

The Braided Stream Terrace Middens

The two middens found at the contact of the braided stream terrace with a meander channel fill have shallower deposits, as predicted in the geomorphic study. The middens in these two sites start at 12 and 35 cm below the surface and extend to 25 and 50 cm respectively. They are only 13 and 15 cm thick. The sediments differ from the Big Lake sites as they are silty sands. The colors are dark brown and dark grayish brown with mottled sediments.

The Buffalo Creek Middens

The Barnes middens found adjacent to Buffalo Creek Ditch are positioned at the contact of the braided stream channel fills and the braided stream terrace. They typically begin between 20-30 cm below the surface with an average beginning depth of 26 cm. The middens extend to 35-70 cm with a mean depth at 52 cm. Their thickness ranges from 15-38 cm with an average thickness of 26 cm. The colors are mottled and are primarily dark brown, very dark grayish brown, brown, and dark gray. The sediment textures in five units consisted of sandy loams. One midden was a silt loam and one was a fine sand. Soils in these areas are Steele Tunica, Routon-Dundee-Crevasse, Tiptonville-Dubbs silt loam, and Hayti fine sandy loam. Unlike the Big Lake middens, the Buffalo Creek Barnes middens did not contain the deep, thin bands of buried midden.

SUMMARY

In summary, this interdisciplinary study has resulted in new information relative to prehistoric occupation in the area immediately west of Big Lake and east of Buffalo Creek Ditch. Seventy sites found in the project include cultural resources dating to the twentieth century, pre-Civil War, Early Mississippian, Middle Mississippian, Late Woodland, Early Woodland, and Late Archaic periods. Over half of the sites found were tested in a limited manner.

Three major landforms which occur in the project area are the natural levee, the braided stream terrace, and the stream channel fill. Sites were found in all settings. Intact Late Woodland middens were found associated with natural levees and at the contact of the braided stream terrace and the meander fill. The earliest sites, those containing Late Archaic (and possibly earlier artifacts), were found in the western portion of the study area. Two of these sites were west of Buffalo Creek Ditch and the third was positioned east of Buffalo Creek Ditch (3MS519, 3MS505 and 3MS482). Twelve sites contained intact Barnes middens and similarities between these sites were presented.

A total of 18 sites are significant or potentially significant. If they cannot be avoided, further testing is recommended. Twelve sites are buried and these locations require further subsurface testing to locate deposits and determine if the proposed project will adversely affect significant strata. Three historic sites date to the pre-Civil War period and two of these sites have prehistoric components which are are significant. One historic site is potentially significant and further archival and informant research is recommended. The remainder of the sites are isolated finds, redeposited and plowzone sites, and late twentieth century historic components; none of which are significant or require further work. Other sites lie outside the project corridor and they have not been evaluated for significance.

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APPENDIX A:

LITHIC ANALYSIS FORM
DITCHES 7 & 13 & BUFFALO CREEK DITCH

STATE SITE NO._____ PAGE_____ of_____
SITE_____ ACC. NO._____ PROVENIENCE_____

LITHICS	CHC	S#	BU	S#	OT	S#	O	S#	SS	LM	O	S#	SUB-T	#TA
A_____														
W_____														
M_____														
PP/K TIPS														
PP/K MIDSECT														
PP/K BASE (Uniq)														
UTILIZED BIFACE														
PREFORM														
HAMMERSTONE														
EDGE GR. COBBLE														
PITTED COBBLE														
SANDSTONE ABRADER														
POLISHED STONE														
STEEP UNIFACE														
SPOKESHAVE														
DRILL														
MICRO-DRILL														
UTIL BLADE/FLAKE														
OTHER TOOL														
SUB TOTAL														
CORES AND FRAGS														
MICRO-CORES														
TESTED COBBLE														
PRIMARY DECORT.														
SECOND. DECORT.														
INTERIOR FLAKE														
PREFORM THINNING														
BIFACE THINNING														
TRUE BLADE														
MICRO-BLADE														
PRESS. FLAKE/ABM														
OTHER														
SUB TOTAL														
FCR														
UNMOD COBBLE														
UNMOD STONE														
UNMOD ANG. FRAG.														
TOTALS														

APPENDIX A:

DITCHES 7,13 AND LOWER BUFFALO CREEK CERAMICS

TEMP. SITE NO. _____ STATE SITE NO._____

ACCESSION NO._____ PROVENIENCE_____

		PLAIN CT	PLAIN WT	DECORATED CT	DECORATED WT	DECORATED CT	DECORATED WT	TOTAL CT	TOTAL WT
SHELL	RIM	CT							
		WT							
		FSN		FSN		FSN			
	BASE	CT							
		WT							
		FSN		FSN		FSN			
	BODY	CT							
		WT							
		FSN		FSN		FSN			
	TOTAL								
SAND/ SHELL	RIM	CT							
		WT							
		FSN		FSN		FSN			
	BASE	CT							
		WT							
		FSN		FSN		FSN			
	BODY	CT							
		WT							
		FSN		FSN		FSN			
	TOTAL								
		PLAIN		CORDMARKED		DECORATED			
SAND	RIM	CT							
		WT							
		FSN		FSN		FSN			
	BASE	CT							
		WT							
		FSN		FSN		FSN			
	BODY	CT							
		WT							
		FSN		FSN		FSN			
	TOTAL								
SAND/ GROG	RIM	CT							
		WT							
		FSN		FSN		FSN			
	BASE	CT							
		WT							
		FSN		FSN		FSN			
	BODY	CT							
		WT							
		FSN		FSN		FSN			
	TOTAL								
GROG	RIM	CT							
		WT							
		FSN		FSN		FSN			
	BASE	CT							
		WT							
		FSN		FSN		FSN			
	BODY	CT							
		WT							
		FSN		FSN		FSN			
	TOTAL								
TOTAL									

FIRED CLAY (COUNT) W/SAND_____ W/OUTSAND_____OTHER_____TOTAL_____

RECONSTRUCTABLE VESSELS _____ UNSORTED PARTICLES_____

OTHER CERAMICS_____

APPENDIX A:

DITCHES 7, 13, AND LOWER BUFFALO CREEK

HISTORIC ARTIFACTS

TEMPORARY SITE NO._____ STATE SITE NO._____

Accession No._____ FSN_____Provenience_____

SUB NO.	COUNT	ARTIFACT DESCRIPTION
---	_____	round nails
---	_____	square nails
---	_____	misc. metal
---	_____	other _____
---	_____	clear glass, window
---	_____	green glass, window
---	_____	clear glass, other_____
---	_____	green glass, other_____
---	_____	brown glass
---	_____	blue glass
---	_____	purple glass
---	_____	milk glass
---	_____	pressed glass
---	_____	glass, other _____
---	_____	glass, other _____
---	_____	whiteware
---	_____	transferware_____
---	_____	transferware_____
---	_____	crockery_____
---	_____	stoneware_____
---	_____	churn fragment_____
---	_____	porcelin
---	_____	handpainted_____
---	_____	other_____
---	_____	other_____
---	_____	other_____
---	_____	other_____
---	_____	marbles, glass
---	_____	marbles, ceramic
---	_____	electrical insulators, glass
---	_____	electrical insulators, porcelin
---	_____	other_____
---	_____	other_____
---	_____	other_____
TOTAL	_____	

APPENDIX B:

LITHIC DEFINITIONS

by

Robert A. Taylor

PROJECTILE POINT/KNIFE FRAGMENTS (PP/K): These are portions of bifaces other than preforms. These fragments are usually not diagnostic of a particular cultural stage, but may be indicative of a general use (if serrated, or otherwise flaked/resharpened in a diagnostic way). A type name if known or a general description was written in the blank for whole pp/k's thought to be Archaic (A), Woodland (W) or Mississippian (M). Fragments were counted under the appropriate portion (tip, midsection or base).

UTILIZED BIFACE: These are artifacts which have been modified on two faces to form a working edge. They lack hafting elements and some are late stage preforms. They are unidentifiable as to specific type.

PREFORM: These are bifacially flaked and usually symmetrical in outline, but lack secondary pressure flaking and evidence of hafting. They also lack use retouch or wear. Some show obvious obstacles to further thinning or shaping and are interpreted to be aborted preforms.

HAMMERSTONE: These are cobbles that show battering or abrasion on convex edges. Usually, the heavier the battering, the more nearly spherical the cobble will be. Fragments of cobbles that show the edge battering or characteristic interior fractures along multiple cones of force are counted in this category.

EDGE GROUND (GR.) COBBLE: These are generally flat cobbles with abraded or lightly pecked edges, lacking the heavier battering of hammerstones.

PITTED COBBLE: These are cobbles, usually sandstone, having two opposite faces nearly flattened by weathering. On either or both of the nearly flat faces are one or more pits. These pits may be either "V"-shaped or "U"-shaped in cross section and are generally shallower than their maximum diameter.

SANDSTONE ABRADER: These are irregular pieces of sandstone, usually coarse-grained, having one or more grooves with "V"-shaped or "U"-shaped cross sections which were apparently produced by abrading and sharpening bone and wooden tools.

POLISHED STONE: This is any stone with an intentionally polished surface. Artifacts with use polish on or near a working edge are not counted in this class.

STEEP UNIFACES: These are unifacially worked flakes with at least one steeply retouched edge. They would presumably have functioned as scrapers.

SPOKESHAVE: These are unifacially worked flakes with at least one concavity along a prepared edge.

DRILL: These are bifaces, probably reworked projectile points, with the blade portion reduced to a nearly cylindrical or steeply diamond-shaped cross section. They presumably functioned as drills.

MICRO-DRILL: These are micro-blades having a thick cross section and secondary retouch near the distal tip, indicating use as perforators or drills.

UTILIZED BLADE/FLAKE (UTIL BLADE/FLAKE): These are flakes or blades which show use retouch or prepared working edges. They lack flaking on the reverse face other than use retouch and, in some cases, removal of the bulb of percussion by a single secondary flake. Flakes from proveniences such as the surface and plowzone are not counted as utilized unless the secondary retouch is extensive or otherwise determined to be intentional.

OTHER TOOL: Any lithic tool which does not conform to one of the more specific definitions presented above is entered in this class. This includes adzes and adz fragments particularly.

CORES AND CORE FRAGMENTS (CORES AND FRAGS): These are cobbles with at least three flakes removed, usually more. Most have two prepared platforms for removal of flakes and those used more extensively are completely decorticate (except perhaps on a striking platform) and have the appearance of truncated polyhedrals. Identifiable fragments, including large flakes retaining much of the striking platform, are counted in this category.

MICRO-CORES: These are small, polyhedral cores that may be nearly cylindrical. They are often of exotic chert, especially Burlington-like. Blades have usually been removed from both ends of the more cylindrical cores, and the blades tend to travel the length of the core.

TESTED COBBLE: These are cobbles of a sufficient size to serve as cores, usually patinated cherts, which have one or two flakes removed, as if they were being tested for chippable qualities.

FLAKES OF PRIMARY DECORTICATION (PRIMARY DECORT.): These are flakes of any size but often large which retain cortex on 90% or more of their obverse surface.

FLAKES OF SECONDARY DECORTICATION (SECOND. DECORT.): These are flakes of any size which retain cortex on less than 90% of their obverse (dorsal) surface. Flakes with cortex only on the portion of the striking platform retained at the proximal end are not counted in this category, but are counted as interior flakes.

INTERIOR FLAKES: These are flakes with no cortex, or with cortex only on the striking platform, that do not have the characteristics of true blades, preform or biface thinning flakes, or pressure flakes. Interior flakes usually have a nearly right angle striking platform, or at least the striking platform is not acute and shows no bifacial flaking. This is an "other flake" category, and flakes without striking platforms or bulbs of percussion (flake fragments) are counted here. Flakes which show thermal alteration such as irregular fractures or potlids are also counted here if there is evidence that the flakes were produced by percussion before they were burned.

PREFORM THINNING FLAKES: These are flakes with an acute striking platform, bifacial flaking on both faces of the proximal edge, and the "lip" characteristic of soft hammer percussion. The bifacial flaking consists of broad flake scars, not apparently produced by pressure flaking and showing no use wear.

BIFACE THINNING FLAKES: These are flakes similar to preform thinning flakes which differ in the nature of the bifacial flake scars. At least some of the flake scars originating at the proximal edge must be the narrow, shallow scars characteristic of pressure flaking or must be the steep, short scars resulting from use. Questionable bifacial thinning flakes are counted as Preform Thinning.

TRUE BLADE: These are flakes which are at least twice as long as their maximum width. In addition they must show at least two flake scars on their obverse surface indicating the prior removal of similar long flakes. They may be either triangular or trapezoidal in transverse section. They differ from "Interior Flakes" only in their greater length-width ratio.

MICRO-BLADE: These are blades that have been struck from micro-cores. They may be thin or triangular in cross section, but thick, trapezoidal blades were apparently sought for use as micro-drills and perforators.

PRESSURE FLAKES/ABRASION MATERIAL (PRESS FLAKE/ABM): These are the small, thin flakes produced by application of the flaking tool to a restricted area on a thin, usually bifacial, edge. The flake expands from a narrow point of origin and usually follows a ridge produced by two earlier flake scars on its dorsal surface. There is no pronounced bulb of percussion. Very small, thin, flake fragments which were probably produced by abrading an edge prior to pressure flaking are also counted in this category.

OTHER: Any lithic specimen which does not readily fit a more specific definition is assigned to this class.

FIRE CRACKED ROCK (FCR): These are fragments of stone of any kind which show evidence of thermal alteration, especially irregular breaks, but also including fragments with potlids and color changes and those which do not fit a more descriptive category. FCR includes some potlidded flakes on which no compression rings and no bulbs of percussion are visible. Because of thermal alteration, sorting by raw materials was difficult and no attempt was made to sort artifacts into specific chert types other than Crowley's Ridge chert when cortex was retained or color change was minor. All fire cracked rock identified was either "Crowley's Ridge chert", "sandstone", "orthoquartzite" or "other chert".

UNMODIFIED COBBLE (UNMOD COBBLE): These are stream cobbles, with cortex, of any material from which no flakes have been removed and which do not show abrasion, polishing, pitting, or other evidence of intentional shaping.

UNMODIFIED STONE (UNMOD STONE): These are stones that show no intentional modification of any kind. They differ from the class "Unmodified Cobble" in lacking an obvious weathered patina or cortex, and differ from "Unmodified Angular Fragments" in being generally larger and having regular breaks compatible with natural exfoliation and limited weathering.

UNMODIFIED ANGULAR FRAGMENTS (UNMOD ANG. FRAG.): These are angular fragments of any lithic material which show no intentional shaping or use. They are mostly fragments with irregular breaks but no obvious indications of thermal alteration.

Classes of Lithic Raw Materials

The following are descriptions of the classes of raw materials used in the analysis of the lithics from the prehistoric sites located in the SPEARS Project. These are not formal descriptions. They are based on macroscopically observed characteristics only, and are intended as a guide for the preliminary sorting appropriate to a survey and initial testing phase analysis and for planning research designs that may incorporate lithic resource studies. The abbreviations used on the Ditches 7, 13 and Lower Buffalo Creek Ditch Analysis Form follow the class name.

Crowley's Ridge Chert (CRC): The chert or gravel from Crowley's Ridge is quite variable in color but is typically brown, tan, yellowish tan, gray, gray tan or cream colored. Red colors are less common and could be a result of thermal alteration. The cortex, which is usually smooth, is often darker and may be brown, reddish brown or grayish brown. Interiors are sometimes mottled, but less commonly banded (House 1975:82).

Burlington Chert (BU): All white or whitish cherts collected during the fieldwork were classified as Burlington-like chert. Most of the whitish chert was mottled with gray or yellow. These colors are consistent with cherts derived from the Burlington limestone in southern Illinois and adjacent areas in Missouri (Myers 1970; Rick 1978; McElrath 1986).

Orthoquartzite (OT): This stone is whitish with clear, rounded quartz sand grains in a translucent whitish matrix. The stone is well cemented with the siliceous matrix and fractures through the quartz sand grains. Known outcrops of this material are located on Crowley's Ridge.

Other Cherts (O): These include all other cherts not typically characteristic of those described above. Because of the difficulty in sorting thermally altered materials, most of the chert in the fire cracked rock class was counted as "other chert" although it is probably from Crowley's Ridge gravels.

Sandstone (SS): Sandstone is composed of quartz sand grains of any size embedded in a silicate or other matrix which is softer than the quartz grains so that the stone breaks around the sand grains. Exterior colors are usually brown or reddish brown.

Limestone (LM): Some well rounded pebbles of limestone were collected. These are interpreted to be crushed agricultural limestone applied historically to increase the pH of the acidic clays in the project area.

Other Stone (O): Any lithic material not readily identifiable as chert, orthoquartzite, sandstone or limestone is included in this class.

APPENDIX C:

LITHIC TOOL DESCRIPTIONS

by

Robert A. Taylor

INTRODUCTION

For each tool in the collection, a verbal description and descriptive measurements are presented below. These are arranged in order by site number with Mississippi County first followed by Craighead and Poinsett Counties. For hafted bifaces, there are six measurements including the maximum length of the specimen, the maximum width and thickness of the blade, the maximum length and width of the stem, and the width of the stem at its junction with the blade. For bifaces with contracting stems, the "Junction" measurement is identical to the maximum width of the stem. For corner notched and side notched bifaces, the "Junction" was measured at the narrowest part of the stem where the notches are deepest. Measurements are in millimeters, and weight is in grams. Weight is recorded only for hammerstones and cobbles.

ABBREVIATIONS USED: c=Completeness; A=Almost Whole or 75-99% Complete; B=26-74% Complete; and C = A Small Fragment or Less Than 25%.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS41	6a	86-925	17-4	A-15

c Length	c Width	c Thickness	Wt.
50	49	22	78

Hammerstone. This discoidal sandstone pebble has moderate battering on two opposite edges.

State Site No.	Acc. No.	FSN No.	Provenience
3MS41	86-925	20-5	A-18

c Length	c Width	c Thickness
17	19	10.9

Utilized Flake. This is an interior flake of lightly mottled very light brown Crowley's Ridge chert. It has use retouch across the broad distal end and use polish with striations on the dorsal surface near the distal end.

State Site No.	Plate 6b	Acc. No.	FSN No.	Provenience
3MS41		86-925	61-6	B-37

c Length	c Width	c Thickness	Wt.
26	19	14	11

Hammerstone. This is a small pebble of unidentified, dense stone with pecking or light battering on all surfaces.

State Site No.	Acc. No.	FSN No.	Provenience
3MS41	86-925	65-4	B-41

c Length	c Width	c Thickness	Wt.
41	26	25	34

Hammerstone. This is a small pebble of Crowley's Ridge Chert with light battering on all acute edges and moderate battering at one end. One small flake has been removed from one steep edge.

State Site No.	Acc. No.	FSN No.	Provenience
3MS41	86-925	77-8	C-3

c Length	c Width	c Thickness
C 26	C 24	4

Polished Stone. This is a thin fragment of very fine grained sandstone or siltstone with a polished surface with very slight curvature. No striations are visible at 10x magnification.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS41	6c	86-925	88-7	C-14

c	Length	c	Width	c	Thickness	Wt.
A	47		45		26	78

Hammerstone? This pebble of fine-grained sandstone is pecked on all surfaces except a small depression near one end and a fracture along one edge. The fracture may have been caused by heat since one surface of the pebble is slightly blackened.

State Site No.	Acc. No.	FSN No.	Provenience
3MS41	86-925	92-7	C-18

c	Length	c	Width	c	Thickness
	21		17		4

Micro-core. This is a thin, rectangular flake fragment of brown Crowley's Ridge chert with at least two tiny burin-like blades removed from one edge. The blade scars are only 14 mm long and less than 2 mm wide.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS41	5e	86-925	93-7	C-19

c	Length	c	Width	c	Thickness
	42		20		24

Pebble Core. This is a pebble of red Crowley's Ridge chert with several flakes removed. At least 4 broad flakes have been removed from 4 striking platforms. Cortex retained on two faces of the pebble is brownish red.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS41	4f	86-925	94-7	C-20

c	Length	c	Width	c	Thickness
	34		31		22

Core. This is a small cobble fragment of whitish, Burlington-like chert, with several flakes removed. At least 3 striking platforms are retained. About 1/2 of the cobble surface is polished and subangular, indicating that it was obtained from stream gravels near its original source.

State Site No.	Acc. No.	FSN No.	Provenience
3MS41	86-925	95-8	C-21

c Length	c Width	c Thickness
15	11	3.0

Utilized Flake. This is an interior flake of whitish, Burlington-like chert with use retouch along the right lateral edge (viewed ventrally). There is also use retouch on alternate faces of the acute distal tip as if it were used as a drill. Use retouch at the tip is on the left lateral edge (in both dorsal and ventral views).

State Site No.	Acc. No.	FSN No.	Provenience
3MS41	86-925	96-9	C-22

c Length	c Width	c Thickness
B 17	B 29	10

Sandstone Abrader. This is a fragment of medium-grained sandstone with 1 smoothed surface having a groove across it. The opposite surface is not smoothed. The groove is "V" shaped (@ 90 degrees), about 6 mm wide and 2 mm deep.

State Site No.	Acc. No.	FSN No.	Provenience
3MS41	86-925	96-11	C-22

c Length	c Width	c Thickness
C 39	C 30	8.6

Utilized Flake of Secondary Decortication. This is a distal fragment of a blade-like flake with cortex retained at the distal end. Use retouch extends 20 mm along the proximal portion of the left blade edge (viewed dorsally with proximal end toward viewer). It is mottled light brown Crowley's Ridge chert with brown cortex.

State Site No.	Plate 6f	Acc. No.	FSN No.	Provenience
3MS41		86-925	97-8	C-23

c Length	c Width	c Thickness	Wt.
B 56	B 39	31	98

Celt Fragment/Hammerstone. This is a fragment of a polished celt of unidentified igneous stone, with heavy battering on two broken faces.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS41	3a	86-925	98-12	C-24

c	Length	c	Width	c	Thickness
B	21		A9		3.0

Utilized Micro-blade. This is the distal end of a micro-blade. It is triangular in cross-section. It has a shallow, spokeshave-like concavity produced by use retouch on the left lateral edge (viewed ventrally). It also has light use retouch on the dorsal surface of the acute tip extending @ 3 mm along the distal left lateral edge (viewed dorsally). The dark gray chert may be Burlington.

State Site No.	Acc. No.	FSN No.	Provenience
3MS41	86-925	98-13	C-24

c	Length	c	Width	c	Thickness
B	21	A	25		5.0

Utilized Flake of Bifacial Retouch. This is the proximal end of a broad flake fragment with use retouch extending 11 mm along the left lateral edge. The use extends from the proximal end distally to the broken edge of the flake. It is lightly mottled whitish chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS41	7a	86-925	100-1	Near B-29

c	Length	c	Width	c	Thickness	Wt.
	88		66		56	388

Hammerstone. This is a cobble of Burlington-like chert with heavy battering on one end. It is light gray to gray chert with a thin pinkish white cortex. Colors may be thermally altered, although there are no characteristic heat fractures. This is a fragment of a large cobble apparently used as a hammerstone after the cobble was broken, since the broken edges are lightly battered.

State Site No.	Plate 6d	Acc. No.	FSN No.	Provenience
3MS41		86-925	101-1	mapped

c Length	c Width	c Thickness
A 30	B 29	26

Sandstone Abrader. This is a fragment of a pebble of medium-grained sandstone with remnants of at least 4 "V"-shaped grooves on three surfaces. One groove is about 60 degrees in cross-section and 6 mm wide, and one is about 80 degrees and 5 mm wide. The other two are not measurable.

State Site No.	Plate 5f	Acc. No.	FSN No.	Provenience
3MS93	28	86-943	1-1	Surface

c Length	c Width	c Thickness
35	34	18.5

Micro-core. This is a roughly tabular blade core with 2 parallel micro-blade scars at one end. It is a honey-colored and lightly mottled light gray chert with red mottles. It is typed as Crescent Quarry-like "Other" chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS93	86-943	1-2	Surface

Too small for meaningful measurements

Tested Cobble/Hammerstone Fragment. This is a cobble fragment (shattered) with one blade scar on a cortexed surface and tiny, steep scars along a broken edge. It may be a hammerstone fragment. It is red Crowley's Ridge chert with light reddish brown cortex, and may be thermally altered.

State Site No.	Plate 1b	Acc. No.	FSN No.	Provenience
3MS480		86-927	2-1	20 degrees W of N 19 m

	BLADE			STEM	
c Length	c Width	c Thickness	c Length	c Width	c Junction
B	43	9.9	15	20	20

Projectile Point Fragment. This untyped fragment resembles the Burkett (Chapman 1980:306) type except that it is more barbed. It is straight stemmed with straight base. It has strong shoulders (1 barbed and 1 slightly barbed). It is mottled gray-brown, brown, and blue-gray chert with white inclusions and whitish cortex on 1 face. About 1/3 of the distal blade is broken with some probably recent damage (fine step fractures) on the broken edge.

State Site No.	Acc. No.	FSN No.	Provenience
3MS481	86-929	7-1	8N, 12W

c Length	c Width	c Thickness
31	22	13.3

Adz. This is a small, thick biface, probably a small adz. A fresh fracture with no usewear has removed a portion of one end, and may indicate that it was broken during resharpening. Both ends are very battered and dulled. It is light brown Crowley's Ridge chert with fossil inclusions. It is similar to other adzes that have been found in Woodland contexts.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS482	2b	86-931	1	Surface

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
A 21	25	>5	9	24	17

Projectile Point Fragment. This is the base and midsection of an untyped side notched projectile point. The tip and the surface of both faces have been removed by pot lidding. It has keyhole-like side notches. It probably had straight blade edges. It has a slightly concave base. One edge of the stem is lightly ground. The base is steeply retouched on one face. It is a pink "other" chert obviously discolored by heat.

State Site No.	Acc. No.	FSN No.	Provenience
3MS483	86-942	4-4	Surface

BLADE		
c Length	c Width	c Thickness
B 25	A 16	>7

Projectile Point Fragment. This is a midsection of a finely retouched biface. It is extensively fractured (proximally, distally, and on half of one face) by heat, causing slight reddening of a lightly mottled, light brown, Crowley's Ridge chert. It would have been a narrow blade with a very acute distal tip. No portion of the base or tip is retained. There is perhaps slight use polish on the extreme distal portion of one blade edge. The polish is not visible under 10X magnification, but the edge is smooth when touched with the tip of the tongue.

State Site No.	Acc. No.	FSN No.	Provenience
3MS492	86-923	2	Mapped surface

c Length		c Width		c Thickness
C	72	B	79	A 21

Hoe Fragment. This is the proximal (basal) portion, probably about 1/3 of a chipped stone hoe made from Mill Creek chert. It has hafting polish at the proximal end, and the lateral edges are heavily ground. Some of the ridges between flake scars are also polished. All edges show some recent damage.

State Site No.	Acc. No.	FSN No.	Provenience
3MS493	86-930	5-1	85 degrees E-N 72.5 paces

c Length	c Width	c Thickness
18	20	2.8

Utilized Flake. This is a flake of Burlington-like chert (lightly mottled light gray), apparently a preform thinning flake. It has a slight lip on the striking platform and multiple small flakes on the obverse face. There is fine use retouch on the ventral face extending about 10 mm along the right half of the distal flake edge (when viewed ventrally).

State Site No.	Acc. No.	FSN No.	Provenience
3MS493	86-930	6-1	#6 Mapped

c Length	c Width	c Thickness
21	42	11.0

Utilized Flake of Secondary Decortication. There is cortex on about 40% of the dorsal surface. The rest of the cortex has been removed by 2 prior flakes and by 2 flakes which have been struck from this flake. There is use retouch on the left lateral edge (when viewed dorsally) along a margin produced by the removal of two flakes struck from the left edge. It is lightly mottled brown Crowley's Ridge chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS493	86-930	9-6	TU-1, 10-20 cm

c Length	c Width	c Thickness
17	12	4.5

Utilized Flake. This is a small flake fragment with use retouch along the left lateral and distal edges. A portion of the left edge showing retouch is slightly concave. The right lateral edge appears to be recently broken with some minute retouch along one edge of the break. It is light brown chert, probably Crowley's Ridge chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS493	86-930	10-8	TU 1, 20-30 cm

BLADE

c Length	c Width	c Thickness
15	35	6.2

Utilized Flake. This is a broad flake struck from a biface. There is tiny use retouch on the dorsal face of the flake along about 10 mm of the right distal edge of the flake. It is brown Crowley's Ridge chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS493	86-930	39-6	C-10

c Length	c Width	c Thickness
38	29	10.2

Scraper. This is a bifacially flaked adz-like scraper with light use retouch and light polish on a distal convex edge. It has an ovate shape. It is whitish chert (probably Crowley's Ridge chert, but labeled "other") with a large pink area with coarse texture.

State Site No.	Acc. No.	FSN No.	Provenience
3MS493	86-930	47-1	B-7

BLADE

c Length	c Width	c Thickness
C 9	C 3	

Biface Fragment. This tiny fragment of a biface has one large flake scar on one face and tiny use flakes on the opposite face. Irregular breaks on all but one edge may indicate that it is fire cracked. It is red chert, probably Crowley's Ridge chert.

State Site No.	Plate 5a	Acc. No.	FSN No.	Provenience No.
3MS493		86-930	48-6	B-6

c Length	c Width	c Thickness
29	32	10.8

Adz, or Adz-Like Scraper. This is a small bifacially flaked adz made on a pebble, with cortex on one face. There is use retouch along a convex distal edge. It is brown Crowley's Ridge chert with a reddish cortex.

State Site No.	Acc. No.	FSN No.	Provenience
3MS493	86-930	54-2	A-1

c Length	c Width	c Thickness	Wt.
68	61	41	200

Anvil Stone. This is a chert cobble with two flakes removed from each end (perhaps 3 or more on one of the ends with light battering). The opposite, flattened, faces each have a battered surface forming a very slight depression. This is a mottled red and yellow quartzite-like chert, probably Crowley's Ridge chert, with ooliths or sand grains. It fractures through the grains but erodes around them on the surface.

State Site No.	Plate 7b	Acc. No.	FSN No.	Provenience
3MS494		86-932	1-1	Surface

c Length	c Width	c Thickness	Wt.
115	84	62	792

Pitted Hammerstone. This is a coarse grained sandstone cobble. It is ovoid with a shallow pit (<3mm) on one nearly flattened face, and a pecked area on the opposite face. Both ends and one edge from end to end have moderate battering/pecking.

State Site No.	Acc. No.	FSN No.	Provenience
3MS494	86-932	4-5	CC-1,20-35

c Length	c Width	c Thickness
15	21	4.9

Utilized Flake. This is a flake of secondary decortication with use retouch extending 4 mm along the left lateral edge (viewed dorsally). It is lightly banded red Crowley's Ridge chert with red cortex. The utilized edge is opposite the cortex, giving the flake a backed edge. It fits description of "citrus flake" (Goodyear 1974; Stanfill 1986)

State Site No.	Plate	Acc. No.	FSN No.	Provenience No.
3MS495	2d	86-938	1-1	45N, 12W

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
35	17	4.7	8	16	12

Projectile Point. This is an untyped side notched (Woodland?) arrowpoint. It has slightly convex blade edges with no barbs. It has a straight base. It is lightly mottled, light brown Crowley's Ridge chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS496	86-941	3-1	294 degrees 44.15 m

c Length	c Width	c Thickness	Wt.
A 86	A 61	A 58	287

Hammerstone/Anvil Stone. This is a very fine grained sandstone cobble fragment, with all edges moderately battered, except around a break at one end. It has remnants of a shallow pit on one face.

State Site No.	Acc. No.	FSN No.	Provenience
3MS497	86-947	1-1	53W, 3N

c Length	c Width	c Thickness
19	30	5.9

Utilized Flake. This is a broad, interior flake with use retouch extending 14 mm along the right distal edge (when viewed ventrally). This white chert lightly mottled with yellowish brown is Crescent Quarry-like but could be Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS497W	4c	86-945	2-1	Surface

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
40	33	8.1	12	23	22

Projectile Point. This is a broadly corner notched projectile point, similar to Marcos type. Broad corner notches have produced small barbs, and the appearance of a straight, broad stem with a straight base. One blade edge is straight and the other is slightly recurved. It has an acute tip and resembles the Big Creek type, except for the straight base. The white chert with tiny pits is probably Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS497	6g	86-947	3-3	Surface

c Length	c Width	c Thickness	Wt.
38	44	39	103

Hammerstone/Edge-Ground Cobble. This is a fine-grained sandstone cobble fragment with a flat broken face smoothed by grinding. All edges are lightly battered and/or ground.

State Site No.	Acc. No.	FSN No.	Provenience
3MS497	86-947	3-4	Surface

c Length	c Width	c Thickness
39	26	15

Pebble Core. This is a pebble with at least 5 flakes removed, only one of which was an interior flake probably without cortex. It is brown, light brown, and reddish brown Crowley's Ridge chert with brown cortex.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS497	3b	86-947	23-3	TU-1, 50-60 cm

		BLADE		
c Length		c Width		c Thickness
B	27	A	17	A 5

Projectile Point Distal Tip. This is a thin, well-flaked tip, obviously discolored by heat. Light retouch along alternate faces of the tip and color at a transverse break indicate that the specimen probably broke during reshaping after heat treating. Heating may have been accidental since some use wear preceded the color change. It is burned red and is slightly blackened on the exterior. It has been recorded as "other" chert, probably Crowley's Ridge chert. Its thinness, flaking, and blade silhouette is identical to a specimen (FSN 1-1) from 3MS495.

State Site No.	Acc. No.	FSN No.	Provenience
3MS498	86-955	1-1	19S, 86W

Too small for meaningful measurements

Sandstone Abrader. This is a fragment of medium grained sandstone with recent breaks. It has a shallow, broadly V-shaped groove on one face adjacent to a smoothed (ground), flat surface. There are remnants of a broad, ground surface on the opposite face.

State Site No.	Acc. No.	FSN No.	Provenience
3MS498	86-955	7-5	A-3

c Length	c Width	c Thickness
26	16	12.8

Utilized Flake. This is a flake of secondary decortication with cortex on and near the striking platform. The bulb of percussion has been partly removed by a single large flake on the ventral surface. Use retouch on the ventral surface of the right lateral edge extends around the distal tip of the flake and onto the distal portion (dorsally) of the left lateral edge. This indicates use as a drill. It is lightly mottled, light brown Crowley's Ridge chert with red cortex.

State Site No.	Acc. No.	FSN No.	Provenience
3MS498	86-955	13-5	A-9

Too fragmentary for meaningful measurements

Hammerstone Fragment. This is a fragment of a large chert cobble with moderate battering on one cortexed face and along adjoining edges. It is red chert with reddish gray cortex. It is a weathered, poor quality Crowley's Ridge chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS498	86-955	20-3	A-16

c Length	c Width	c Thickness
20	12	9

Hematite. This is a small, irregular, unmodified pebble of red hematite. Slight abrasion on one edge appears to be recent.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS498	1e	86-955	78-5	C-B

BLADE						STEM					
c	Length	c	Width	c	Thickness	c	Length	c	Width	c	Junction
B	37	A	30	A	10	A	9	A	22	A	22

Projectile Point Fragment. This is an untyped stemmed projectile point midsection. It has been extensively fractured by heat on all but one lateral edge. One weak shoulder is retained. A single large flake was removed from the distal edge after the specimen had been fractured by heat. It is a highly mottled grayish brown chert with a pinkish cast, typed as "other" chert.

State Site No.	Plate 6h	Acc. No.	FSN No.	Provenience
3MS498		86-955	96-3	D-6

c Length	c Width	c Thickness	Wt.
79	68	41.9	367

Pitted, Edge-ground Cobble. This is a combination hammer/anvil stone. It is a fine-grained sandstone cobble, naturally flattened. It has a shallow (3mm) pit on one face, with pecking on the opposite face. All edges have been modified by grinding and by battering on one end.

State Site No.	Acc. No.	FSN No.	Provenience
3MS498	86-955	110-7	D-20

Too fragmentary for meaningful measurements

Hammerstone Fragment. This is a chert cobble fragment with cortex on 2 faces and rough, angular breaks elsewhere. There is moderate battering on one cortexed edge. There is heavier battering on a nearby edge where the cortex has been removed from one face of the cobble prior to use as a hammer.

State Site No.	Acc. No.	FSN No.	Provenience
3MS502	86-961	13-2	A-4

Too small for meaningful measurements

Biface Fragment. Only one edge of this specimen is preserved, with fresh breaks on 3 edges. Large flake scars on both faces suggest this was a preform. It is a whitish, "other" chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS502	86-961	19-5	A-10

c Length	c Width	c Thickness
A 22	13	4.1

Utilized Biface. This may be an arrowpoint made on a flake, but looks more like a distal tip of a slightly larger biface, reworked on all edges and slightly serrated on one lateral edge. The distal tip is broken with a pot lid fracture, and a pot lid removed a corner of the base or proximal end, which is steeply retouched (on one face only). The banded gray chert with a pinkish cast interiorly is obviously thermally altered. It is catalogued as "other chert".

State Site No.	Plate 6e	Acc. No.	FSN No.	Provenience
3MS502		86-961	46-1	B-10

Too small for meaningful measurements

Sandstone Abrader. This is a fragment of medium grained sandstone with recent breaks. It has 1 deep, V-shaped groove on one face. There is a trace of a second, parallel groove on the same face. There is a trace of 1 groove each on two other faces. The area between the two grooves on the first face is slightly abraded perpendicular to the two parallel grooves.

State Site No.	Plate 4g	Acc. No.	FSN No.	Provenience
3MS502		86-961	49-1	B-12

c Length	c Width	c Thickness	Wt.
38	32	29	46

Hammerstone. This is a small cobble of whitish chert with tan and gray inclusions with weathered cortex which is whitish with some yellow. The once-angular cobble has all edges rounded by battering. It is a Burlington-like chert.

State Site No.	Plate 3g	Acc. No.	FSN No.	Provenience
3MS502		86-961	70-1	C-5

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
B 20	13	6.7	7 A	11	10

Arrowpoint Fragment. This is a shallowly side notched base and midsection with a slightly concave base. Both faces are left-beveled. The distal tip is broken. It is banded red, reddish, and greenish chert which resembles Alibates, but could be Crowley's Ridge chert. It is recorded as "other" chert.

State Site No.	Plate 5d	Acc. No.	FSN No.	Provenience
3MS502		86-961	75-4	C-12

c Length	c Width	c Thickness
B 35	A 44	A 12

Adz-like Scraper. This is a bifacially flaked fragment of an adz-like biface, plano convex in cross-section along a transverse break. There is use retouch on the dorsal surface at the slightly convex distal edge. There are striations and use polish on the ventral surface of the distal edge. It is lightly mottled brown to light brown Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS502	3c	86-961	84-1	D-3

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
B 34	A 29	8.0	12	19	16

Projectile Point Base and Midsection. This is an untyped projectile point with an expanded stem. It has obvious color change from burning. The tip, shoulders, and one lateral edge have been broken since the color change. The stem is slightly expanded with a slightly convex base. It is mottled red and gray on the surface, and red with whitish fossils interiorly. It is probably Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS503	3d	86-962	8-1	Mapped #8

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
47	24	7.4	15	16	13

Untyped, Stemmed Projectile Point. This is an expanded stem projectile point with a straight base and strong shoulders. The blade edges are slightly convex, and the blade is beveled on the right edge of both faces. One blade edge has a shallow concavity that is probably recent edge damage. Lateral edges of the stem are steeply beveled on the right edge of both faces. The base is also steeply beveled on one face, and is lightly ground.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS504	3e	86-967	1-1	207N, 83 W

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
38	26	8.6	16	17	17

Projectile Point. This is an untyped contracting stem projectile point. It is Gary-like with weak shoulders. The base is straight along an abrupt break or striking platform. It has minute retouch along one edge of the break at the base. Retouch on the blade has produced a left bevel on both faces. Retouch flake scars on the blade are a slightly more intense color than older flake scars and may indicate re-use at a significantly later date or after heat treating. It is mottled brownish-gray and brown chert, typed as "other".

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS504	1f	86-967	3-1	199N, 94W

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
48	38	9.5	17	20	20

Gary Projectile Point. This specimen has a contracting stem (nearly bi-pointed) with prominent shoulders and no barbs. There is little or no pressure retouch. One blade edge is straight, and the other is slightly convex. It is lightly banded brown Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS504	2e	86-967	5-1	67W, 120N

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
42	25	8.2	12 A	20	16

Untyped Projectile Point. This is an untyped side notched projectile point with straight shoulders, convex base, and slightly convex blade edges. It has use retouch on the blade edges. It is banded brown and light brown Crowley's Ridge chert with whitish brown cortex on 1 face. It is made on a flake and retains a remnant of the original ventral flake surface.

State Site No.		Acc. No.	FSN No.	Provenience
3MS504		86-967	12-1	TU-1, 40-50 cm
c Length	c Width	c Thickness		
35	18	4.5		

Utilized Flake. This is a preform thinning flake with light use retouch extending at least 10 mm along the proximal portion of the left lateral edge (on dorsal face of flake). It is a mottled brown and gray Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS504	3h	86-967	13-1	45.90N,0.45W

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
20	15	2.8	4	8	7

Arrowpoint. This is a Scallorn or Scallorn-like arrowpoint made on a flake. The lightly streaked light brown chert may be Crowley's Ridge chert or Crescent Quarry (Burlington-like) chert. There are small serrations on the straight blade edges. It is corner-notched with a straight base (which is the unmodified flake edge).

State Site No.	Acc. No.	FSN No.	Provenience
3MS504	86-967	20-1	NWL

BLADE

c Length	c Width	c Thickness
B 31	A 28	8.4

Projectile Point midsection utilized as scraper. This may be a preform broken during notching. The blade is pressure flaked, but both the distal blade and the base are broken. One shoulder is broken, perhaps by the same blow that removed the base. One lateral edge shows use retouch, and one portion of the retouch is along a concave margin. The opposite lateral edge shows slight use retouch and/or recent edge damage. It is lightly banded and mottled, light brown Crowley's Ridge chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS504	86-967	35-5	B-16

BLADE

c Length	c Width	c Thickness
C 18	B 19	A 12

Projectile Point Distal Tip. This is the distal tip of an unidentified projectile point. The blade edges were apparently slightly convex and were not beveled. It is brown Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS505	3f	86-970	1	41W 35N

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
38	26	10.7	18	18	16

Projectile Point. This is an untyped, broadly side notched projectile point. Blade edges are nearly straight with an acute tip. The blade is thick and the blade edges show some steep retouch from resharpening. The base is straight and unfinished or broken. The notches are broad and shallow and produce weak shoulders on the blade. It is generally similar to other expanded stem points from Woodland assemblages.

State Site No.	Acc. No.	FSN No.	Provenience
3MS505	86-970	2-2	38W 28N

BLADE

c Length		c Width		c Thickness	
B	32	B	24	A	8

Projectile Point Tip. This is the distal tip of an untyped projectile point. It has a thick, biconvex cross section, and the blade edges show steep use retouch. The convex blade edges were finely retouched by pressure flaking. It is a mottled gray and bluish gray, untyped chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS505	86-970	8	11.43m 12 degrees 36'20"

c Length	c Width	c Thickness
18	17	7.7

Core Fragment. This could also be classified as an interior flake, except that it retains two striking platforms. There is a bulb of percussion on the ventral face of the flake near one platform and a negative bulb of percussion on the same surface at the distal end, indicating this flake was struck from a small core using a bipolar technique. It is very light brown Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS505	6i	86-970	15	20.08m 1 degree 2' 40"

c Length	c Width	c Thickness	Wt.
91	69	38	337

Hammerstone. This is a flat cobble of fine grained sandstone. It has moderate battering on the edge at one end and light battering at the opposite end, with some light battering on one flat face near the end with light battering. There is also moderate battering on one lateral edge and light grinding on the opposite lateral edge.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS505	3i	86-970	18	27.97m 285 degrees 51'

BLADE

c Length	c	Width	c	Thickness
C 21	B	13	A	4

Projectile Point Midsection. This is a midsection of an untyped, thin, projectile point. The tip has been removed by a hinge flake, and this midsection was removed by a heavy percussion blow on one edge of the original specimen. It is a mottled light brown and very light brown chert, perhaps from Crowley's Ridge.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS505	4e	86-970	24	TU1, Surface

BLADE

c Length	c	Width	c	Thickness
48		24		7.4

STEM

c Length	c	Width	c	Junction
12	B	18		16

Projectile Point. This is an untyped side notched projectile point. Notches are similar to the type Cache River Side Notched (Perino 1971:14-15), but this point is thicker and more randomly flaked than most Cache River specimens. The blade edges are slightly recurved from resharpening and the distal tip has been removed by a stepped hinge fracture. A few small, retouch flakes along the broken tip indicate the point was used after it had been broken. The base is slightly concave and one side of the base has been removed by a steep hinge fracture. The base has moderate edge grinding and the stem edge that is retained has light grinding. It is a Crescent Quarry or Burlington-like whitish chert, lightly mottled with light brown.

State Site No.	Acc. No.	FSN No.	Provenience
3MS505	86-970	28	16.06m, 192 degrees 42'

c Length	c	Width	c	Thickness	Wt.
64	A	55	A	29	122

Hammerstone Fragment. This is a fragment of a cobble of unidentified red chert with fossils. A portion of one nearly flat surface and two edges are retained on this fragment. Both edges have heavy battering. All other surfaces are irregularly broken.

State Site No.		Acc. No.	FSN No.	Provenience
3MS505		86-970	29	27.90m 211 degrees 58'

c Length	c Width	c Thickness
26	25	11

Pebble Core Fragment. This is an angular fragment of a pebble of light brown Crowley's Ridge chert with one small area of red cortex. The fragment retains two striking platforms at right angles to each other.

State Site No.	Plate	Acc. No.	FSN No.	Provenience No.
3MS505	5h	86-970	30	37.0m, 216 degrees 29'

c Length	c Width	c Thickness
24	19	13

Pebble Core Fragment. This is a wedge-shaped fragment of a pebble used as a flake core. Portions of three striking platforms are retained. Two platforms are opposite each other and indicate use of a bipolar flaking technique. Cortex is also retained on two surfaces of this pebble of light brown Crowley's Ridge chert.

State Site No.		Acc. No.	FSN No.	Provenience
3MS506		86-972	6-7	TU1,30-40

c Length	c Width	c Thickness
30	13	6.4

Utilized Flake. This is an interior flake with use retouch at the distal end. The use retouch extends 4 mm across a shallow concavity and then 3mm across a graver-like spur (this retouch is only on the dorsal surface of the flake). It is mottled light brown Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS507	6j	86-976	4-1	Mapped surface

c Length	c Width	c Thickness	Wt.
47	45	45	121

Hammerstone. This is a pebble of fine-grained sandstone, sub rounded, with light to moderate battering on all acute edges.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS507	2f	86-976	6-1	Mapped #7

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
A27	30	5.6	A 12	20	20

Hafted Bifacial Endscraper. This is a bifacially flaked scraper, perhaps made from a Gary-like projectile point (base is broken). The working edge is convex with evidence of resharpening and remnants of use polish on the edge. It is mottled light brown and red Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS510	4a	86-933	1-1	Surface of spoil

c Length	c Width	c Thickness
26	11	10

Micro-core (exhausted). This is a bi-polar, bi-pointed core with both striking platforms reduced to acute points. It has remnants of 8 blade scars. It is a whitish very light gray, Burlington-like chert, with tiny gray inclusions.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS511	2c	86-934	1-1	Surface

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
A 32	17	6.8	10 A	10	9

Projectile Point. This is probably a Late Woodland arrowpoint, similar to a provisional "Weona" type (Dan F. Morse, personal communication). It is broadly side notched with a straight base. It has weak shoulders and slightly convex blade edges. Both corners of the base are broken. The base is straight and retouched only on one face; and the original ventral face of the flake on which the point was made is still visible along the unretouched face of the base. The distal tip is broken by impact with iron (or steel) There are traces of rust at the impact point on the dorsal surface of the specimen. It is brown Crowley's Ridge chert.

State Site No.	Acc. No.	FSN No.	Provenience
3MS512	86-937	1-1	Mapped surface

Fragment @ 2 cm square

Biface Fragment. This is a small fragment of whitish, Burlington-like chert. It is roughly square, and two edges are broken by steep fractures. The other two edges have some shallow retouch flaking with a few short, steep flakes which may be use retouch. Although this appears to be a biface fragment, it could also be a fragment of a core, and the edges with retouch could be remnants of striking platforms.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS512	4a	86-937	2-1	Mapped surface

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
>29	23	9.0	15	24	21

Untyped Projectile Point. This is an exhausted projectile point/knife. The stem is expanded and the base is slightly convex. It may have been corner notched, but the shoulders have been removed by extensive resharpening. The blade edges are steeply retouched with stacked step fractures and could not be further thinned or resharpened. The tip is broken by a hinge fracture which has been retouched with short steep flakes. All edges of the blade and the broken tip are dulled. It is a whitish chert classified as "Other chert".

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS514	7c	86-940	1-1	Surface

c Length	c Width	c Thickness	Wt.
78	71	61	375

Hammerstone. This is a nearly spherical chert cobble, about half decorticate, with heavy battering over most of the decorticate surface. It is mottled light brown Crowley's Ridge chert with brown and whitish brown cortex.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS515	1c	86-946	1-1	N62, E13

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
63	29	10.2	15	23	19

Projectile Point. This is an expanded stem projectile point with a convex base. It has strong shoulders with no barbs. The blade edges are slightly convex. The stem is formed by broad corner notches. It is highly mottled gray and brown and light blue chert (probably Crowley's Ridge chert). This is probably a Woodland projectile point type.

State Site No.	Acc. No.	FSN No.	Provenience
3MS518	86-966	1-1	93E,37S

BLADE		
c Length	c Width	c Thickness
40	29	10.3

Biface Fragment. This is a biface or preform fragment, reworked and utilized as a scraper. It is red and brown Crowley's Ridge chert with a tiny remnant of light brown cortex. It has large, percussion flaking overall with minute use retouch along the reworked broken edge. A fresh fracture post-dates the use retouch and the reworked edge would probably be a "snap" fracture using the Ho Ho classification (Cotterell et al. 1979). It has a steep edge angle along the utilized edge.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS519	1a	86-921	1	250 degrees SW at tree

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
74	39	12.7	17	22	22

Burkett Projectile Point. This projectile point fits the published description of Burkett Stemmed (Chapman 1980:306). It has a contracting stem, thinned by one or two short blade scars on each face. The shoulders are prominent but not barbed, and the blade edges are slightly recurved. It is made from mottled brown Crowley's Ridge chert. The type occurs in contexts dating from the Late Archaic to the Middle Woodland periods.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS519	2a	86-921	2	130 degrees E 15 paces

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
35 A	25	7.8	11 A	15	13

Untyped Corner Notched Projectile Point. This small projectile point has deep corner notches with strong barbs (although one barb is broken) and is similar to the Marcos type (Bell 1958:42). The base is straight (and also broken on one corner). The blade edges are nearly straight with evidence of resharpening and are dulled by use. It is made from mottled light brown Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3MS522	3j	86-973	1-1	77N, 0E

BLADE		
c Length	c Width	c Thickness
B 20	A 15	A 4

Projectile Point base and midsection. This is an untyped lanceolate arrowpoint fragment with a straight base. The blade edges are slightly expanding from the base to the midsection. It is broken transversely near mid blade. It is brown Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3CG917	5c	86-953	1-1	53E, 30N

c Length	c Width	c Thickness
52	34	20.5

Adz. This is a chipped stone adz. It has heavy grinding and/or a tiny remnant of cortex on the dorsal ridge. There are remnants of a black residue on both lateral edges just distal to the middle and highest portion of the dorsal ridge. There are also remnants of the residue on the dorsal face just proximal to the middle of the dorsal ridge. There is perhaps slight use polish on dorsal flake ridges near the distal edge. It is made from mottled reddish brown Crowley's Ridge chert. It is similar to other adzes found in Late Woodland contexts.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3CG918	4d	86-954	5-6	A-5

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
35	25	6.4	13	14	12

Small Projectile Point. This is a shallowly side notched arrowpoint. It has apparently been used as a knife with steep retouch along the blade edges. One blade edge is straight and the other is slightly convex. The side notches are very shallow, and the base is bulbous, although the basal edge is straight. It is a very light gray chert with tiny gray inclusions (Burlington-like), recorded as "other" chert.

State Site No.		Acc. No.	FSN No.	Provenience
3CG918		86-954	6-6	A-6
c Length	c Width	c Thickness	Wt.	
B 27	41	18	33	

Hammerstone. This is a fragment of small sandstone cobble, naturally flattened, with heavy battering at one end. A fresh break has removed the other end.

State Site No.		Acc. No.	FSN No.	Provenience
3CG918		86-954	17-6	TU1, 0-10cm
c Length	c Width	c Thickness		
21	7	4		

Micro Drill. This is a retouched distal fragment of a projectile point (probably an arrowpoint). The tip of a diagonal fracture is minutely retouched and shows wear as on a micro drill. The original distal tip of the biface is also dulled and has apparently been used as a drill. It is light brown chert, probably Crowley's Ridge chert.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3PO501	1d	86-950	21-1	CC-1, 51cm BS

BLADE			STEM		
c Length	c Width	c Thickness	c Length	c Width	c Junction
53	38	11.5	15	23	22

Untyped Projectile Point. This is an untyped, broadly corner notched projectile point with straight shoulders. It has a slightly expanding stem. The base would be nearly straight except removal of a short, flute-like hinge flake has caused slight concavity. Blade edges are slightly convex with use retouch. It is mottled light brown Crowley's Ridge chert. It was found in association with Barnes Cordmarked sherds and is probably a Late Woodland point type.

State Site No.	Acc. No.	FSN No.	Provenience
3PO496	86-952	1-1	26N, 6W

c Length	c Width	c Thickness	Wt.
88	68	46	374

Edge-ground Cobble. This is a very fine-grained sandstone cobble with light grinding on all edges. The flatter surfaces are unmodified.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3PO499	5g	86-948	7-14	TU1 40-50

c Length	c Width	c Thickness
30	25	18

Pebble Core. This is a pebble of light brown Crowley's Ridge chert with several flakes removed. The pebble has been exhausted by the removal of at least 6 broad flakes, reducing it in its longest axis to less than 3 cm. Remnants of striking platforms are retained on two faces of the pebble, and remnants of a tan cortex are also retained on two faces.

State Site No.	Plate	Acc. No.	FSN No.	Provenience
3PO500	5b 34	86-949	4-8	TU-1, 35-45

c Length		c Width		c Thickness
B	26	A	38	A 11

Adz Fragment. This is the bit of a well-flaked adz or adz-like biface. It has been broken by a transverse hinge fracture. The proximal (butt) edge is dulled by abrasion, with slight polish on a ridge between flake scars on one face.

State Site No.	Acc. No.	FSN No.	Provenience
3PO501	86-950	3-6	TU-1, 10-20

c Length	c Width	c Thickness
16	13	4.1
30	24	7.3

2 Utilized Flakes. One of these flakes is brown Crowley's Ridge chert, and one is mottled light brown Crowley's Ridge chert. The brown, larger flake has cortex (brown) at both proximal and distal ends, and flake scars at both ends, indicating it was struck from a pebble core. It has use-retouch along the left lateral edge, on both faces of that edge. The light brown, smaller flake has tiny use-retouch along the dorsal face of the distal edge.

State Site No.	Acc. No.	FSN No.	Provenience
3PO501	86-950	14-6	T.U-1, 40-50

c Length	c Width	c Thickness
19	18	2.4

Utilized Flake of Bifacial Retouch. This is a thin flake with small flake scars on the ventral face at the striking platform. It has pressure flaking over the dorsal surface. There is use retouch along the straight distal edge and along both lateral edges distally. The flake has been burned and the use retouch pre-dates the burning. A few tiny flakes along the proximal left edge are recent, post-dating the burning, and probably resulted from contact with a shovel or trowel during excavation. It is mottled red and gray on the surface with a white spot and has a red interior. It is probably Crowley's Ridge chert, but has been coded "other".

State Site No.	Acc. No.	FSN No.	Provenience
None	86-928	1-1	Surface

c Length	c Width	c Thickness
24	17	4.2

Utilized Flake. This is a whitish flake of Crowley's Ridge chert with red cortex on the dorsal face near the distal end. It has use retouch on the distal portion of the left lateral edge.

State Site No.	Acc. No.	FSN No.	Provenience
None	86-971	1	15N, 30E

c Length	c Width	c Thickness
24	26	6.8

Utilized Flake of Primary Decortication. This is a flake fragment with cortex covering the entire dorsal surface. It is broken both longitudinally and transversely, with use retouch along the ventral edge of both breaks, extending from the intersection of the breaks 17 mm in one direction and 8 mm in the other at a nearly right angle. It is lightly mottled red Crowley's Ridge chert with reddish brown cortex.

APPENDIX D: Artifact Plates

Plate 1. Selected Artifacts. (a: Burkett stemmed projectile point, 3MS519, FSN 1; b: Burkett-like projectile point, 3MS480, FSN 2-1; c: Expanded stem projectile point, 3MS515, FSN 1-1; d: Untyped corner notched projectile point, 3PO501, FSN 21-1; e: Untyped stemmed projectile point, 3MS498, FSN 78-5; f: Gary projectile point, 3MS504, FSN 3-1.)

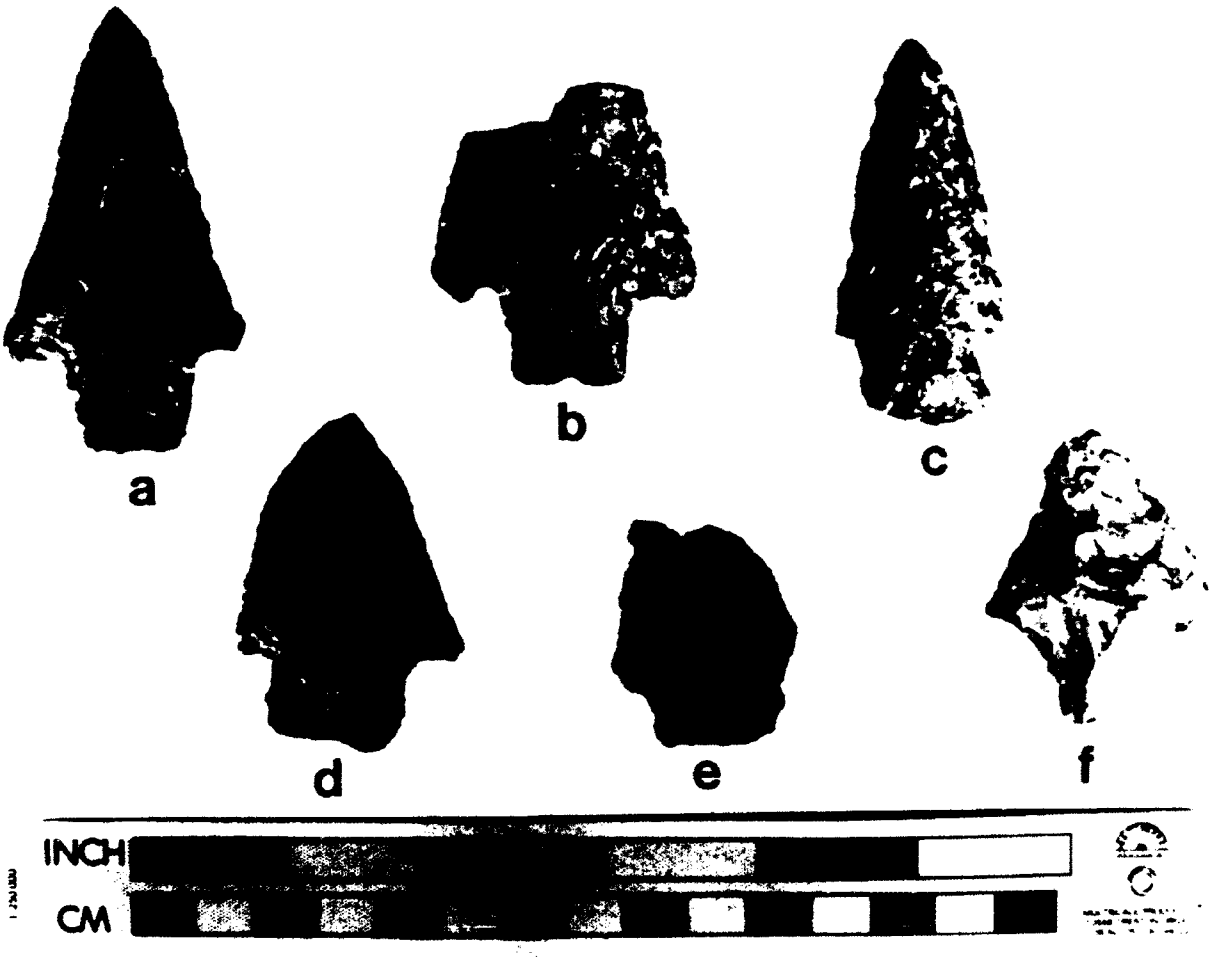


Plate 1

Plate 2. Selected Artifacts. (a: Untyped corner notched projectile point, 3MS519, FSN 2; b: Untyped side notched projectile point, 3MS482, FSN 1; c: Untyped side notched arrowpoint, 3MS511, FSN 1-1; d: Untyped side notched arrowpoint, 3MS495, FSN 1-1; e: Untyped side notched projectile point, 3MS504, FSN 5-1; f: Hafted bifacial endscraper made from a Gary-like projectile point, 3MS507, FSN 6-1.)

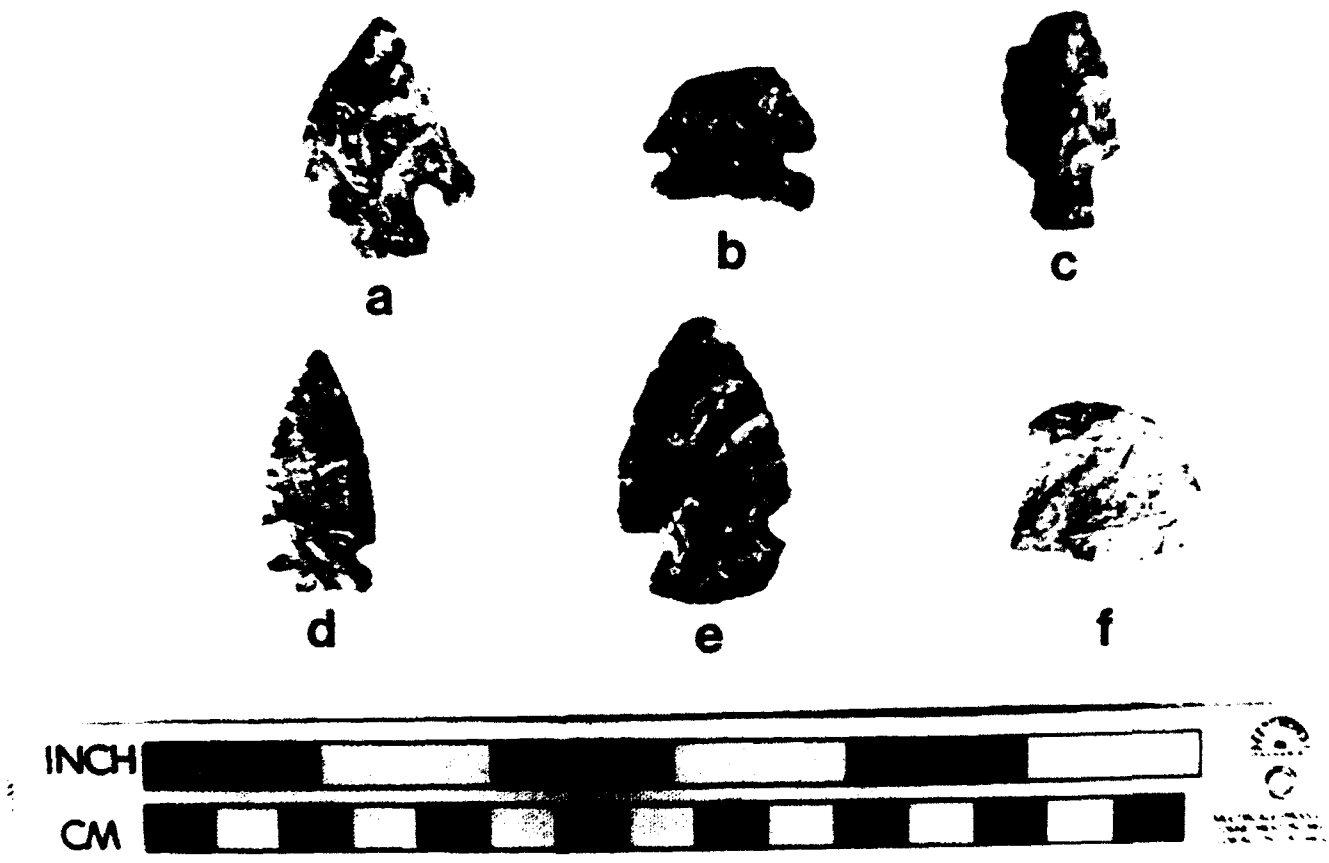


Plate 2

Plate 3. Selected Artifacts. (a: Utilized micro-blade, 3MS41, FSN 98-12; b: Projectile point distal tip, 3MS497, FSN 23-3; c: Untyped projectile point, 3MS502, FSN 84-1; d: Untyped expanded stem projectile point, 3MS503, FSN 8-1; e: Gary-like projectile point, 3MS504, FSN 1-1; f: Untyped side notched projectile point, 3MS505, FSN 1; g: Untyped side notched arrowpoint, 3MS502, FSN 70-1; h: Scallorn arrowpoint, 3MS504, FSN 13-1; i: Projectile point midsection, 3MS505, FSN 18; j: Untyped lanceolate arrowpoint, 3MS522, FSN 1-1.)

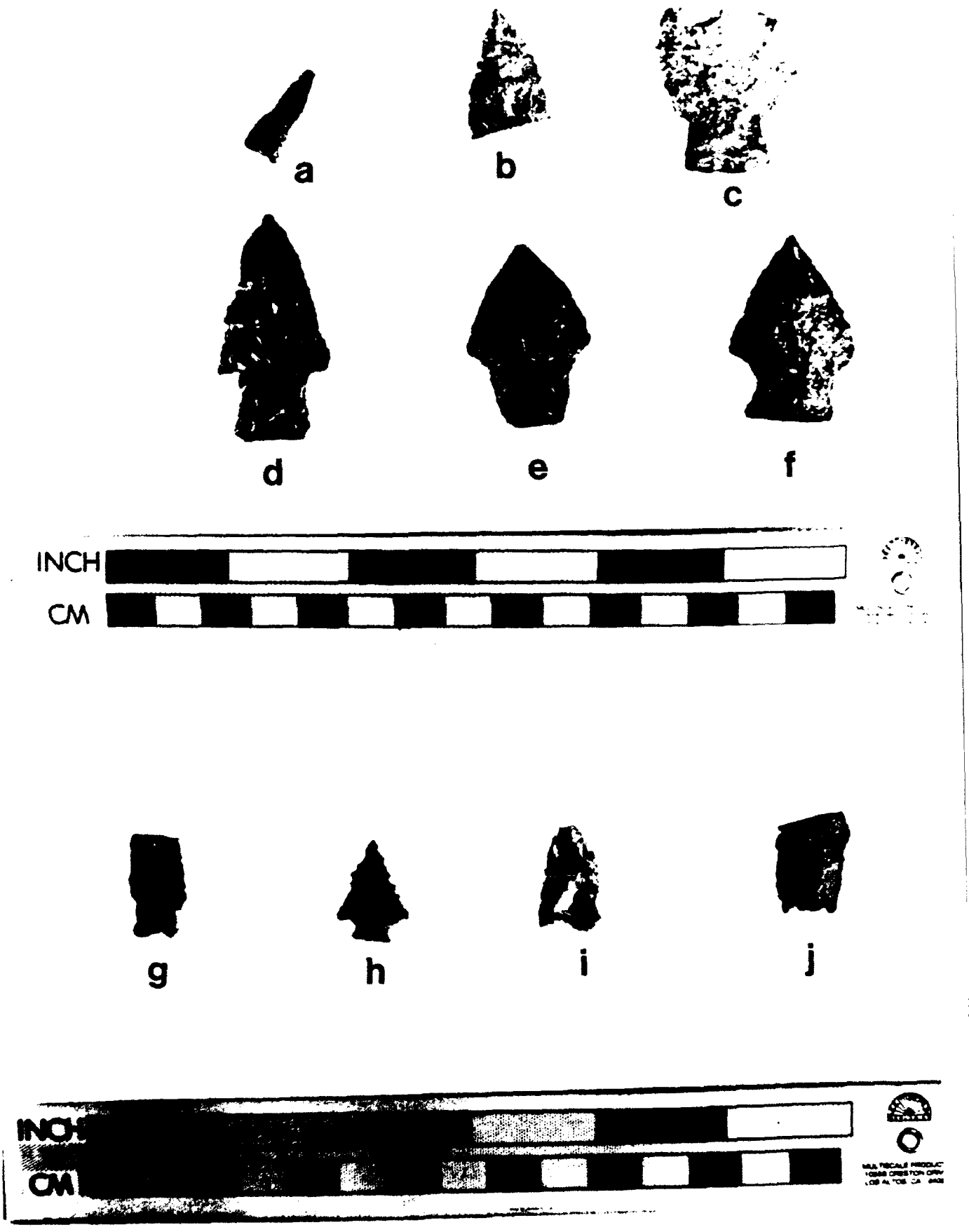
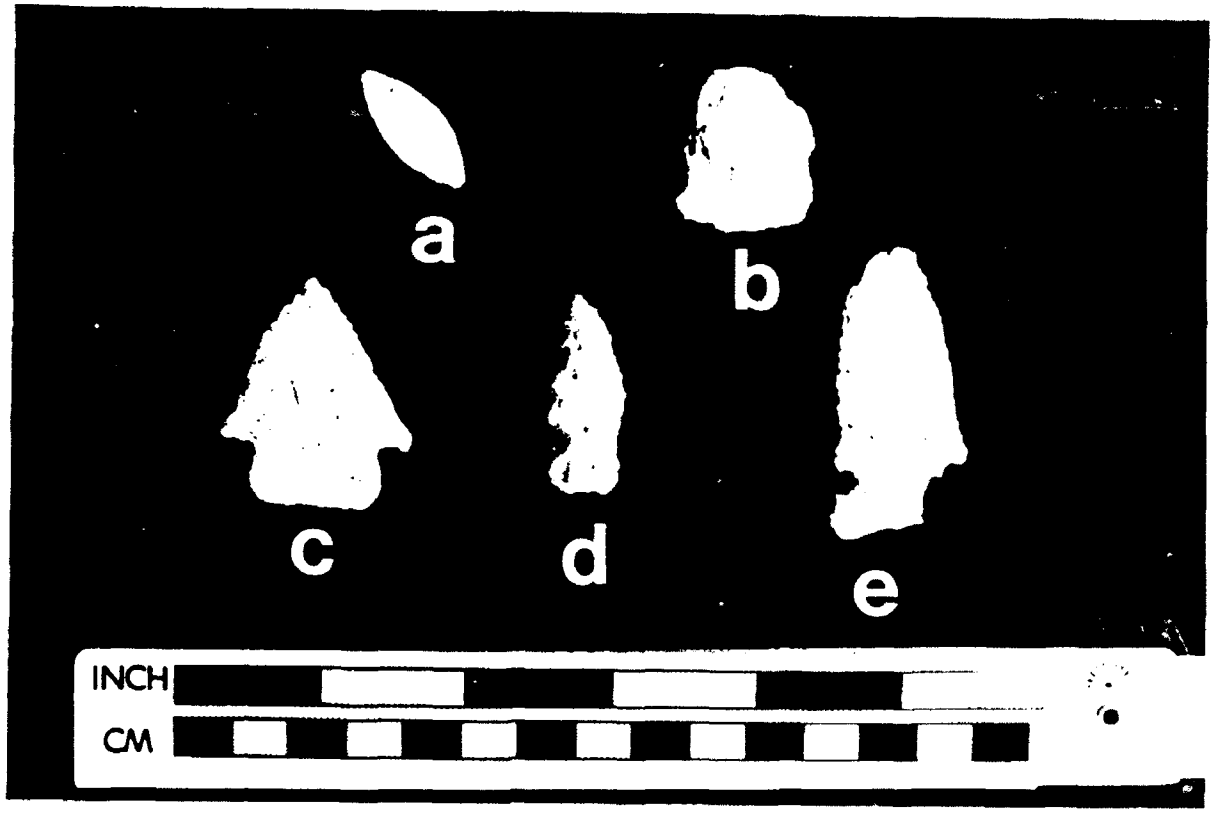


Plate 3

Plate 4. Selected Artifacts. (a: Micro-core, 3MS510, FSN 1-1; b: Untyped projectile point, 3MS512, FSN 2-1; c: Marcos-like projectile point, 3MS497W, FSN 2-1; d: Side notched arrowpoint?, 3CG918, FSN 5-6; e: Untyped side notched projectile point, 3MS505, FSN 24; f: Core, 3MS41, FSN 94-7; g: Hammerstone, 3MS502, FSN 49-1.)



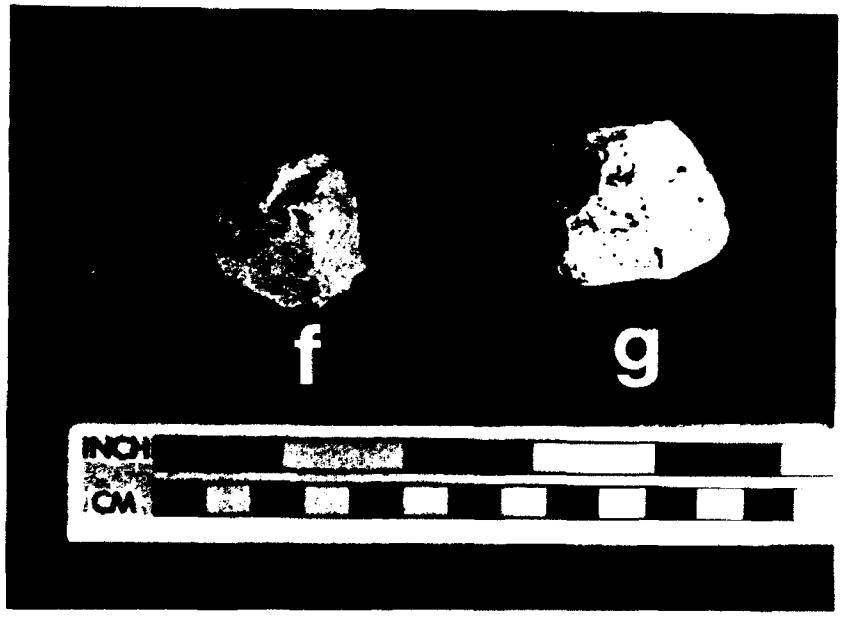
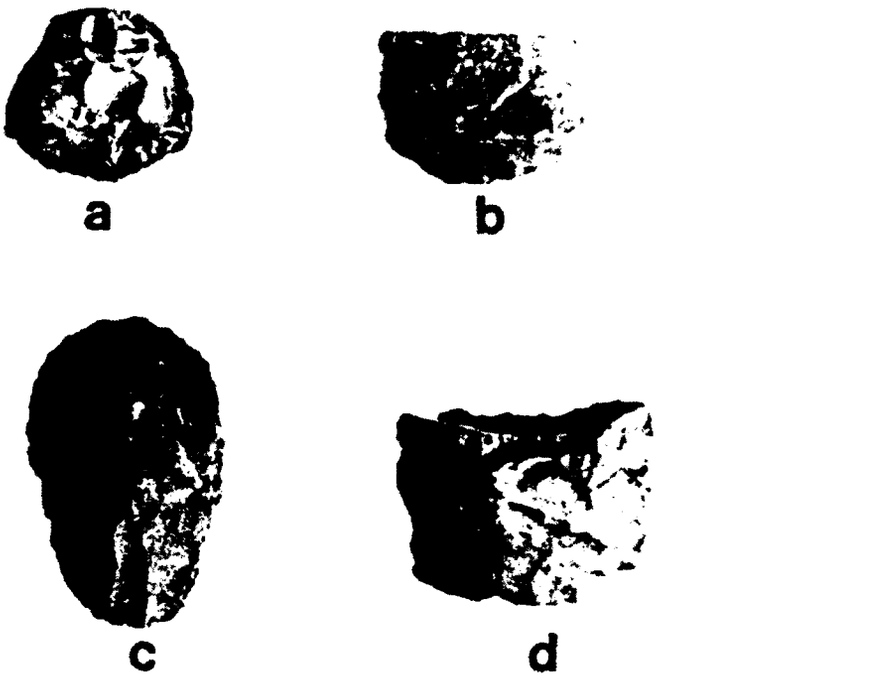


Plate 4

Plate 5. Selected Artifacts. (a: Adz-like scraper, 3MS493, FSN 48-6; b: Adz fragment, 3PO500, FSN 4-8; c: Adz, 3CG917, FSN 1-1; d: Adz-like scraper, 3MS502, FSN 75-4; e: Pebble core, 3MS41, FSN 93-7; f: Micro-core, 3MS93, FSN 1; g: Pebble core, 3PO499, FSN 7-14; h: Pebble core fragment, 3MS505, FSN 30.)



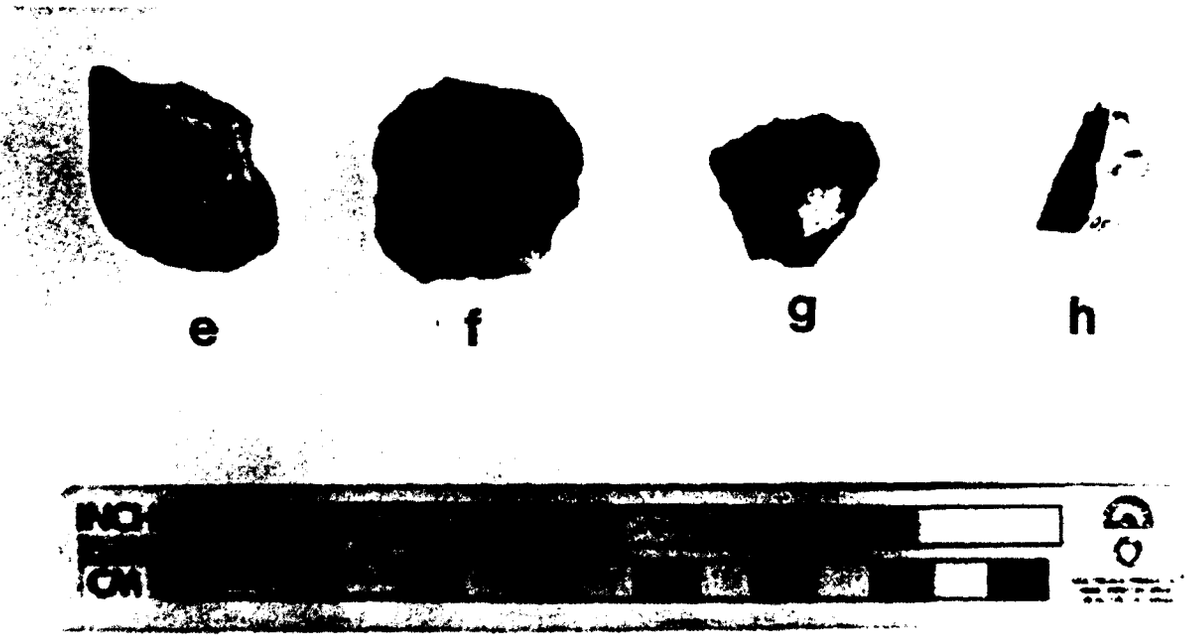


Plate 5

Plate 6. Selected Artifacts. (a: Hammerstone, 3MS41, FSN 17-4; b: Hammerstone, 3MS41, FSN 61-1; c: Hammerstone, 3MS41, FSN 88-7; d: Sandstone abrader, 3MS41, FSN 101-1; e: Sandstone abrader, 3MS502, FSN 46-1; f: Celt fragment/hammerstone, 3MS41, FSN 97-8; g: Hammerstone/edge-ground cobble, 3MS497, FSN 3-3; h: Pitted/edge-ground cobble, 3MS498, FSN 96-3; i: Hammerstone, 3MS505, FSN 15; j: Hammerstone, 3MS507, FSN 4-1.)

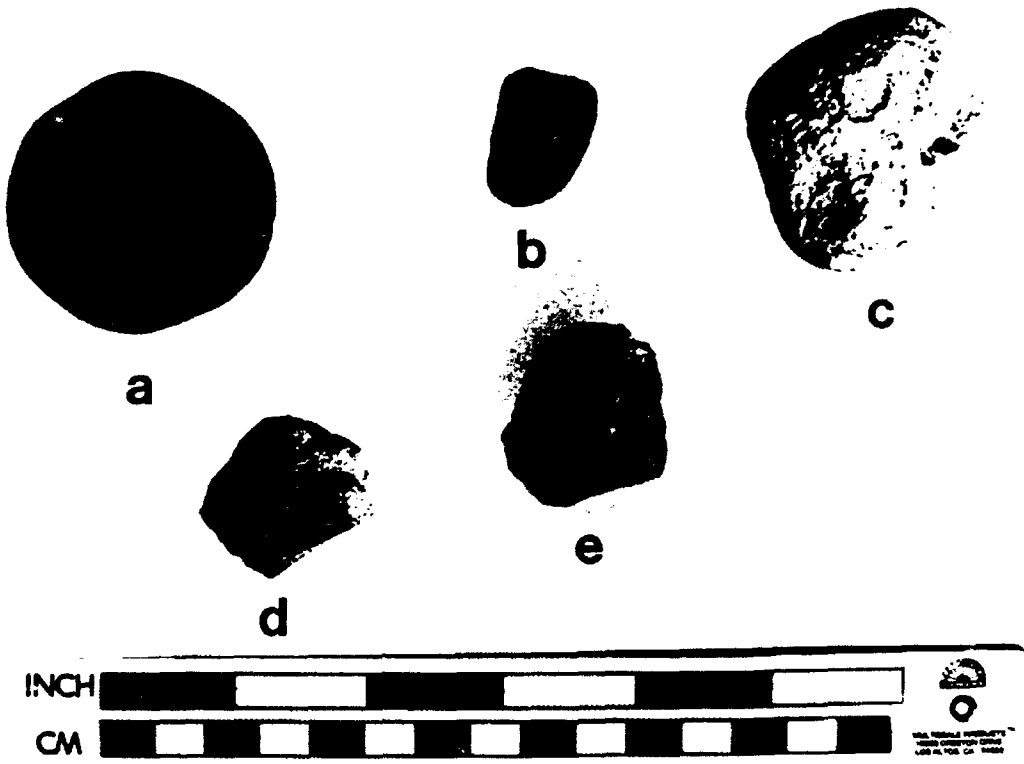


Plate 6

Plate 7. Selected Artifacts. (a: Hammerstone, 3MS41, FSN 100-1; b: Pitted hammerstone, 3MS494, FSN 1-1; c: Hammerstone, 3MS514, FSN 1-1.)

Plate 7

APPENDIX E: Controlled Surface Collection Tables.

Table E1. Ceramics Collected at 3MS41.

Abbreviations Used: Ceramics listed by temper. PL=Plain; RS=Red Slipped; DEC=Decorated; CDM=Cordmarked; S/G=Sand/grog Tempered; FC=Fired Clay; P=Ceramic Particles; MS=Mussel Shell; B=Bone.

FSN	LOC	SHELL			SAND			SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC						TOTAL
7	A5	1															1
8	A6				1	2							X				3
10	A8				1	1							X				2
111	A9	1			1												2
12	A10				1												1
13	A11					1											1
14	A12					1							X				1
15	A13				1	2			1				X				4
16	A14	1				2							X				3
17	A15	2			2	4											8
FSN	LOC	SHELL			SAND			SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC						TOTAL
18	A16					1							X				1
19	A17	1			4	8							X				13
20	A18	2			1	2							X				5
21	A19	3			5	4							X				12
22	A21				5	6			1				X				12
23	A22		1			3							X				4
24	A23				5	3			1				X				9
25	A24												X				
26	A25				1	1							X				2
FSN	LOC	SHELL			SAND			SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC						TOTAL
27	B1	1			2	2							X				5
28	B2				3	1											4
29	B3	2			3	2							X				7
30	B4	1			2	2							X				5
31	B5	1			2	3							X				6
32	B6				1	5											6
33	B7				2	8							X			X	10
34	B8		1		1	1											3
35	B9		1		2	1											4
36	B10				2												2

FSN	LOC	SHELL			SAND			SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC						TOTAL
37	B12				3	1							X				4
38	B13	1			1												2
39	B14	1															1
40	B15				3								X				3
41	B16	1				1							X				2
42	B17	1	2		2								X				5
43	B18	1			7		1						X				9
44	B19		1		4				1				X				6
45	B20				3												3
46	B21	3			5								X				8
FSN	LOC	SHELL			SAND			SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC						TOTAL
47	B22				6				1								7
48	B23	2			6	4											12
49	B24	2			9	2							X				13
50	B25	3			12								X				15
51	B26	3			18	5											26
52	B27	3			27	1							X				31
53	B28	5			16	9							X				30
54	B29	6			20	7			4				X				37
55	B30				9	12							X				21
56	B31	7			21	12						1	X				41
FSN	LOC	SHELL			SAND			SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC						TOTAL
57	B33	6			21	29			1				X				57
58	B34	7	1		16	17							X				41
59	B35	8			30	29							X				67
60	B36	1			17	11							X				29
61	B37	2			8	4							X				14
62	B38				4	2											6
63	B39	1			4	4											9
64	B40				3	1											4
65	B41	1			1	2											4
66	B42	1			3							1					5
FSN	LOC	SHELL			SAND			SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC						TOTAL
67	B43				2	2											4
68	B44	1			3	1							X				5
69	B45				3	1											4
70	B46	1			6												7
71	B47				2	2							X				4
72	B48	2			4	1											7
73	B49	1											X				1
74	B50	1			2	2											5
FSN	LOC	SHELL			SAND			SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC						TOTAL
75	C1	1	1		7	2							X				11
76	C2	3			11	1							X				15
77	C3	5			15	7			1				X				28
78	C4	7			20	6							X				33
79	C5	15			30	16							X				61
80	C6	13	1		38	21			1			1	X				75
81	C7	8			32	13							X				53

FSN	LOC	SHELL			SAND				SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC							TOTAL
82	C8	8	1		24	22								X				55
83	C9	7			27	19								X	X			53
84	C10	11			18	22								X				51
85	C11	3			18	7			1					X				29
86	C12	4	1		13	14								X				32
87	C13	5			18	10								X				33
88	C14	7	4		20	19								X		X		50
89	C15	9	6		22	34	1							X	X			72
90	C16	7	3		24	47			1					X	X			82
91	C17	11			30	33		1						X	X			74
92	C18	4			24	34								X				62
93	C19	2			23	20			1					X				46
94	C20	5			17	20			2					X			X	44
FSN	LOC	SHELL			SAND				SAND/SHELL			S/G	GROG	FC	P	MS	B	
		PL	RS	DEC	PL	CDM	RS	DEC	PL	RS	DEC							TOTAL
95	C21	4	1		29	23								X			X	57
96	C22	9		1	42	29								X				81
97	C23	10	3		24	31								X				68
98	C24	19	4		38	35								X				96
99	C25	6			34	25								X	X			65
TOTAL		271	32	1	947	738	2	1	16			3						2011

Table E2. Lithics Collected in Controlled Surface Collections at 3MS41.

Abbreviations Used: O=Other Tool; DR=Drill; UF=Utilized Flake; H=Hammerston; C=Core; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; FCR=Fire Cracked Rock; BT=Bifacial Thinning; UNMOD=Unmodified Stone.

FSN	LOC	O	DR	UF	H	C	PFLK	SFLK	IFLK	FCR	BT	UNMOD	TOTAL
15	A13											1	1
17	A15				1							1	2
18	A16											1	1
20	A18	1											1
25	A23								1				1
26	A24											1	1
FSN	LOC	O	DR	UF	H	C	PFLK	SFLK	IFLK	FCR	BT	UNMOD	TOTAL
30	B4								1				1
49	B24											1	1
50	B25							2					2
51	B26											1	1
52	B27									1			1
57	B33								1				1
58	B34								2			2	4
59	B35									2		3	5

FSN	LOC	O	DR	UF	H	C	PFLK	SFLK	IFLK	FCR	BT	UNMOD	TOTAL
60	B36							1	3	1		5	10
61	B37				1							3	4
62	B38											4	4
64	B40											1	1
65	B41				1								1
67	B43											5	5
69	B45											2	2
70	B46								1			2	3
72	B48								2				2
FSN	LOC	O	DR	UF	H	C	PFLK	SFLK	IFLK	FCR	BT	UNMOD	TOTAL
76	C2							1					1
77	C3	1							1				2
79	C5						1	1					2
80	C6									1		2	3
82	C8						1						1
83	C9											1	1
84	C10									1		7	8
87	C13											3	3
88	C14	1			1				2			4	8
89	C15											13	13
FSN	LOC	O	DR	UF	H	C	PFLK	SFLK	IFLK	FCR	BT	UNMOD	TOTAL
91	C17								1		1	3	5
92	C18					1	2			2		1	6
93	C19					1						1	2
94	C20					1		1				1	3
95	C21									1		5	7
96	C22	1		1							1	7	10
97	C23										1	1	2
98	C24		1	1							1	6	9
99	C25								1	3	1	38	43
100	Mapped				1								1
101	"	1											1
TOTALS		5	7	3	5	3	4	6	16	12	5	126	186

Table E3. Historic Artifacts Collected in Controlled Surface Collections at 3MS211.

LOCATION	CERAMICS	STONEWARE	GLASS	METAL	OTHER
A1	1 whiteware (pink and green "decal" motif)		2 clear 1 purple 1 milk		1 piece rubber
LOCATION	CERAMICS	STONEWARE	GLASS	METAL	OTHER
A2			1 clear 1 purple 2 green		1 misc.

LOCATION	CERAMICS	STONEWARE	GLASS	METAL	OTHER
A3	2 whiteware				
			3 clear		
			1 brown		
					1 coal
					1 sandstone
A4	3 whiteware				
	1 pearlware base				
			5 clear glass		
			1 green window glass		
			1 brown		
			3 milk (1 impressed)		
				6 misc.	
					1 coal
					1 piece rubber
A5	2 whiteware rims				
	2 stoneware (Bristol slip exterior; Albany interior)				
			1 green window glass		
			1 green glass (other)		
			3 brown glass		
					2 concretions
					1 piece rubber
					1 insulation

LOCATION	CERAMICS	STONEWARE	GLASS	METAL	OTHER
A6	1 whiteware rim				
		1 Bristol slip, brown interior			
		2 albany slip rims			
			1 green window glass		
			2 green (other)		
			1 clear (otherr)		
			2 purple glass		
			3 brown glass		
			1 milk glass		
				4 Misc'l iron	
A7	4 whiteware-1 with green "decal" motif				
			2 clear glass (other)		
			1 green glass (other)		
			3 brown glass		
			3 purple glass		
			1 milk glass		
				1 Misc'l metal	
					2 coal

LOCATION	CERAMICS	STONEWARE	GLASS	METAL	OTHER
A8	1 Bristol slip, marked "ARMOC" in decal, blue mark (Armour)-probably lard 20th c.				
			1 clear glass		

LOCATION	CERAMICS	STONEWARE	GLASS	METAL	OTHER
A9		1 misc'l black-glazed sherd			
A10			1 clear glass		
B1	1 Bristol slip exterior, brown exterior				
			1 clear window glass		
			1 green window glass		
			3 brown glass		
			2 purple glass		

LOCATION	CERAMICS	STONEWARE	GLASS	METAL	OTHER
			1 milk glass		
				1 misc'l metal	
					1 rubber piece
B2	1 green "decal" floral				
	1 base with green mark H...(possibly Homer Laughlin?)				
			2 clear glass (1 perfume base?)		
			5 green glass		
			1 milk glass		
B3	4 whiteware				
		1 light grey salt-glazed exterior, albany interior			
			1 green window glass		
			1 clear glass		
			3 green glass		
			2 milk glass		
				2 misc'l metal	
					2 coal fragments

LOCATION	CERAMICS	STONEWARE	GLASS	METAL	OTHER
B4	1 whiteware				
			1 green window glass		
			5 clear glass		
			2 purple glass		
				3 misc'l iron	
B5	1 whiteware rim				
			1 green window glass		
			2 clear glass		
			1 brown glass		
B6		1 Bristol slip stoneware, Albany slip interior			
B7			1 brown glass		
			2 purple glass		
			1 milk glass		
				5 misc'l metal	
					2 coal pieces
B8	1 whiteware				
			2 brown glass		
				1 misc'l metal	
B9	1 porcelin				
			1 green glass		

Table E4. Ceramics Collected in Controlled Surface Collections at 3MS493.

Abbreviations Used: Ceramics listed by temper. PL=Plain; OTR=Old Town Red; VR= Varney Red Filmed; CDM=Cordmarked; FC=Fired Clay; P=Ceramic Particles.

LOCATION	SHELL			SAND/SHELL	SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR		PL	CDM					
A1						1					1
A2	4				8	3			X		15
A3	1	1			10	14			X	X	26
A4	8	2	2		21	22			X	X	55
A5	11		1		12	31			X	X	55
A6	1				12	13				X	26
A7	1				7	7			X		15
A8					3						3
A9						1			X		1
A10				1	1	2					4
A11					1						1
A12					1						1
LOCATION	SHELL			SAND/SHELL	SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR		PL	CDM					
B1				1		1			X		2
B2	2				3				X		5
B3	2				6	3			X		11
B4	2				6	5			X		13
B5	2				11	16			X		29
B6	3		1		8	9			X		21
B7	5				17	8			X		30
B8	2				14	8			X		24
B9	1				9	8				X	18
B10	2				15	1					18
B11					5						5
B12					1						1
LOCATION	SHELL			SAND/SHELL	SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR		PL	CDM	CS				
C1					2	2					4
C2						1					1
C3	2				18	10			X		30
C4	7	1		1	38	21			X		68
C5	10				39	12			X	X	61
C6	6		1		39	17			X	X	63
C7	11				50	20			X	X	81
C8	6		1		33	21			X	X	61
C9	2				16	12	1		X	X	31
C10	1				18	8			X	X	27
C11	1				34	11			X	X	46
C12	2				12	7				X	21

LOCATION	SHELL PL	SHELL OTR	SHELL VR	SAND/SHELL	SAND PL	SAND CDM	SAND/GROG	GROG	FC	P	TOTAL
D1	4			1	6	10			X	X	21
D2									X		
E1					9	7			X	X	16
E2	1				1						2
E3						3					3
TOTAL	100	4	6	4	486	315			X	X	916

Table E5. Lithic Artifacts Collected in the Controlled Surface Collections at 3MS493.

ABBREVIATIONS USED: PP=Projectile Point/knife; O=Other tool; PRE=Preform; DR=Drill; UF=Utilized Flake; B=Biface; H=Hammerstone; C=CORES; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; PF= Pressure Flake; FCR=Fire Cracked Rock; UNMOD=Unmodified Cobbles, Stones or Angular Fragments.

UNIT	PP	O	PRE	DR	UF	B	H	C	PFLK	SFLK	IFLK	FCR	PF	UNMOD	TOTAL
A4										1				1	2
A5								1							1
A7										1	1				2
A8												1			1
A9								1							1
B4										1					1
B5		1													1
B7						1									1
C3													1		1
C10					1										1
mapped FSN5					1										1
mapped FSN6					1										1
TOTAL	1				3	1		2		3	1	1	1	1	14

Table E6. Ceramics Collected in the Controlled Surface Collections at 3MS498.

Abbreviations Used: Ceramics listed by temper. PL=Plain; RS=Red Slipped; DEC=Decorated; CDM=Cordmarked; S/G=Sand/grog Tempered; FC=Fired Clay; P=Ceramic Particles; MS=Mussel Shell; B=Bone.

FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			TOTAL
4			1			1	1				1		4
5	A1	1			1								2
6	A2	1		1		3					1	X	6
7	A3	1				1	1		1				4
8	A4	2				1	1		3		3		10
9	A5	1				8			1	1			11
10	A6					3					1		4
12	A8	1	1			8	1		1		5		17
13	A9	1				1					3		5
14	A10	1				1	1		1		1		5
FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			TOTAL
15	A11					3					3		6
17	A13				1	1							2
18	A14					1						X	1
19	A15										1		1
20	A16		1			2							3
21	A16						1						1
22	A17	1				3					6		10
23	A18					1					1		2
24	A19	1									1		2
FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			TOTAL
25	A20	1				1							2
27	A22	1		1		3					4	X	9
28	A23					1	1				5		7
29	A24	3			1		1				3		8
30	A25	1				1	1				2		5
31	A26				2		2		1		2		7
32	A27	1							1		1		3
33	A28										2		2
34	A29										6		6
FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			TOTAL
36	B1					1							1
37	B2					4							4
38	B3										2		2
39	B4					3							3
40	B5					2							2
41	B6					1							1

FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			TOTAL
42	B7					1							1
44	B9					2							2
45	B10					1			1		1		3
46	B11					1							1
48	B13					2							2
49	B14										2		2
50	B15										1		1
51	B16					1							1
52	B17					1			1				2
53	B18	1				1							2
54	B19					1							1
55	B20					1			2				3
56	B21	1									3		4
57	B22	2				4					1	X	7

FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			TOTAL
58	B23									1			1
59	B24	2				1					1		4
60	B25					2					1		3
61	B26										2		2
62	B27					2							2
64	B29					1					1		2

FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			TOTAL
67	C2								1				1
71	C6				1	3		1	1				6
72	C7	1			1	2					1		5
73	C8					1					1		2
74	C9					1							1
75	C10					3			2		1		6
76	C11	1				3		1			2		7
77	C12					3		1	2		1		7
78	C13	4				4		1				X	9
79	C14	7				6				2	1		16

FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			TOTAL
80	C15					2			2		1		5
81	C16					2							2
82	C17					7			2		3		12
83	C18								3		9		12
84	C19					1							1
85	C20	1											1
86	C21					1			1	1			3
88	C23					3							3
89	C24					1							1

FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			TOTAL
91	D1					1					1		2
92	D2					4					1		5
94	D4					2							2
95	D5					7					1		8
96	D6					3						X	3
97	D7					9					1		10

FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	TOTAL
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			
98	D8					2					1		3
99	D9					3				1			4
100	D10					3			1				4
101	D11					2	2		2				6
102	D12	1				4			1				6
103	D13					1				1	1		3
104	D14	1				2	1				3		7
105	D15				3	2			3		3		11
106	D16	6				2	1				1		10
107	D17	3				2	2		1		4		12
108	D18	1											1
108	D18	5	1			9	1		2		8	X	26
109	D19	7				10	2				6		25
110	D20	2			3	6	1				6		18
FSN	LOC	SHELL				SAND			SAND/SHELL		FC	P	TOTAL
		PL	RS	OTR	VR	PL	CDM	RS	PL	RS			
111	D21	1				3			1	1	2	X	8
112	D22	3				6			2	3	1	X	15
113	D23	2				4			2	1			9
114	D24	2									6		10
115	D25				3	3			2	1	5		14
116	D26	3	2		1	1					3		10
117	D27										4		4
118	D28	1	1			1							3
119	D29					1							1
TOTALS		76	7	2	17	213	25		48	13	146		547

Table E7. Lithics Collected in Controlled Surface Collections at 3MS498.

Abbreviations Used: PP=Projectile Point; O=Other; Pre=Preform; DR=Drill; UF=Utilized Flake; B=Biface; H=Hammerstone; C=Core; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; FCR=Fire Cracked Rock; PF=Preform Thinning Flake; UNMOD=Unmodified Stone.

FSN	LOC	PP	O	PRE	DR	UF	B	H	C	PFLK	SFLK	IFLK	FCR	PF	UNMOD	TOTAL
5	A1											1				1
7	A3					1										1
8	A4														1	1
12	A8														2	2
13	A9						1						1			2
20	A16														1	1
23	A18											1				1
26	A21														2	2
29	A24											1				1

FSN	LOC	PP	O	PRE	DR	UF	B	H	C	PFLK	SFLK	IFLK	FCR	PF	UNMOD	TOTAL
36	B1														1	1
37	B2												1			1
42	B7														1	1
43	B8														1	1
60	B25										1					1
79	C14								1							1
83	C18												1			1
FSN	LOC	PP	O	PRE	DR	UF	B	H	C	PFLK	SFLK	IFLK	FCR	PF	UNMOD	TOTAL
91	D1											1	1			2
96	D6		1													1
102	D12														1	1
108	D18											1				1
110	D20							1								1
117	D27												1		1	2
TOTAL			1			1		2	1		1	5	5		11	27

Table E8. Ceramics Collected in Controlled Surface Collections at 3MS502.

Abbreviations Used: Ceramics listed by temper. PL=Plain; OTR=Old Town Red; VR=Varney Red; RS=Red Slipped; DEC=Decorated; FC=Fired Clay; P=Particles.

LOCATION	SHELL				SAND/SHELL		SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
A1					2	1							3
A2	1		1		1						x	x	3
A3						1					x		1
A4											x		
A6											x		
A7											x		
A8			1		3		1				x		5
A9	4										x		4
LOCATION	SHELL				SAND/SHELL		SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
A10	3										x		3
A11	7				1		2				x		10
A12	3						3	1			x		7
A13	1		1		3						x		5
A14	2		1				5	2			x		10
A15	1			1			4				x	x	6
A16						2	1				x		3
A17	2										x		2
A18				1							x		1
A19	2										x		2
A20							1				x		1
A21	1						1				x		2
A22	1										x		1
A23											x		

LOCATION	SHELL			SAND/SHELL			SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
B1	2		1				4				x		7
B2					2								2
B3	2						3				x		5
B4	6			1	2						x		9
B5					4		3				x		7
B6	7						1				x		8
B7	1		1					1			x		3
B8								1			x		1
B9								1			x		1
B10	1							1			x		2
B11					1			2			x		3
B12	2						3				x		5
B13	2				2		7	3			x		14
B14	2			1	1		1	4			x		9
B15	1				1		4	4			x		10
B16	6		5				12	3			x	x	26
B17							1	2			x		3
B18	1						11	5			x		17
B19	6						11	7			x		24
B20	2						5	1			x		8

LOCATION	SHELL			SAND/SHELL			SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR		PL	DEC	PL	CDM					
B21					1		7	4			x	x	12
B22	1						9	2			x		12
B23							8				x		8
B24							7	1			x	x	8
B25							9	1			x		10

LOCATION	SHELL			SAND/SHELL			SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
C3				1							x		1
C4	1										x		1
C5					1								1
C6								1					1
C7	2						3	1			x		6
C8											x	x	
C10	2												2
C11	1												1
C12							1				x	x	1
C13	3												3
C14	1												1
C16	2												2

LOCATION	SHELL			SAND/SHELL			SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
D1							4				x	x	4
D2					1		12	1			x	x	14
D3	3						4	1			x		8
D4											x	x	
D5	1			1			9	3			x		14
D8	6		3				4				x	x	13
D9	1						3				x	x	4
D10			1				1				x		2
D11	1										x		1

LOCATION	SHELL				SAND/SHELL		SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
E1	3				3		1				x	x	7
E2	4						1	2			x	x	7
E3							4				x		4
E4	2						1	1			x		4
E5	1						2				x		3
E6	2						4				x		6
E7	1										x		1
E8	3						2				x		5
E9	1										x		1
E10											x		

LOCATION	SHELL				SAND/SHELL		SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
E11					1						x		1
F1							1				x		1
F2	2						10	4			x	x	16
F3	2						13	4			x	x	19
F4					1	1	12				x	x	14
F5	3			2			8	5			x	x	18
F6							11	2			x	x	13
F7							8	3			x	x	11
F10	1			1			14	2			x	x	18
F11	1			1			5	4			x	x	12
											1	sphere	
F12					2		8	1			x	x	11
F13							3	2			x	x	5
F14	1	1									x		2
F15	5			1			5				x		11
F16	2				2		3				x	x	7
F17	1	1					5				x	x	7
F18	1										x		1
F19					2	1	3	1			x		7
F20			2				3				x		5

LOCATION	SHELL				SAND/SHELL		SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
F21	3						3				x		6
G1							7	1			x	x	8
G2							6	1			x		7
G3							3	1			x		4
G4								1					1
G5							3				x		3
G6							10	1			x	x	11
G7							8	1			x		9
G8	3						6				x		9
G9	1						4	1			x		6
G10							3				x		3
G11	1				2		6	1					10
G12	1						4				x		5
G13							2	1			x		3
G14	1						2						3
G15							4	1			x		5
G16							1				x		1
G17							1				x		1
G18							1						1

LOCATION	SHELL				SAND/SHELL		SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
G19											x		
G20	1						2				x		3
G21	1						2						3
G22							1						1
G23											x		
G25											x		
H1							2						2
H2	4						4				x		8
H3					1		2				x		3
H4							2				x		2
H5	1						2				x		3
H6	2						12	1			x		15
H7							3				x		3
H8							2				x		2
H9								1			x		1
H10	1						1	1			x		3
H11	2										x		2
	SHELL				SAND/SHELL		SAND		SAND/GROG	GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM					
TOTAL	152	2	17	11	40	6	401	97			x	x	726

Table E9. Lithic Artifacts Collected in the Controlled Surface Collections at 3MS502.

ABBREVIATIONS USED: PP=Projectile Point/knife; UB=Utilized Biface;A=Adz; PRE=Preform; DR=Drill; UF=Utilized Flake; B=Biface; H=Hammerstone; AB=Abrader; C=CORES; TC=Tested Cobble; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake; PT= Preform Thinning Flake; FCR=Fire Cracked Rock; UM=Unmodified Cobbles, Stones or Angular Fragments.

UNIT	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	PT	FCR	UM	TOTAL
A1																1		1
A2																1		1
A4				1														1
A9																	1	1
A10		1												1		1		3
A14																1		1
A16																	1	1
A18													1					1
A21														1				1

UNIT	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	PT	FCR	UM	TOTAL
B4																	1	1
B10																	1	1
B12							1											1
B14												1						1
B19																1		1
B20																	1	1
UNIT	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	PT	FCR	UM	TOTAL
C3														1				1
C5	1																	1
C8													1					1
C10																	1	1
C12			1															1
C13	1																	1
UNIT	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	PT	FCR	UM	TOTAL
D1														1				1
D3	1																	1
D10														1				1
E2														1				1
E3																	1	1
E5																	1	1
E6																	1	1
F4														1				1
F6											1							1
F7															1			1
F11																	1	1
F12																	2	2
F13														1		1		2
F16																	1	1
F18																	1	1
F20																1		1
UNIT	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	PT	FCR	UM	TOTAL
G2																	1	1
G7																	1	1
G12																1		1
G15																	1	1
G22																	1	1
G24																	1	1
H10													1					1
H11																	3	3
	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	PT	FCR	UM	TOTAL
TOTAL	3	1	1	1			1				1	1	3	11	1	8	22	54

Table E10. Ceramics Collected in the Controlled Surface Collections at 3MS504.

Abbreviations Used: Ceramics listed by temper. PL=Plain; OTR=Old Town Red; VR=Varney Red; RS=Red Slipped; DEC=Decorated; FC=Fired Clay; P=Particles.

LOCATION	SHELL				SAND/SHELL		SAND						TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM	DEC	SAND/GROG	GROG	FC	P	
TU1 surf								4						4
A1	1													1
A4							1							1
A5							1							1
A8	1						1							2
A9							2							2
A10						1	2							3
A11	1							1						2
A12	2						1	1				x		4
A13	5						5							10
A14	1		1				8	2						12
A15							17	9						26
A16							17	10				x		27
A17	4						17	11				x	x	22
A18	4						32	10				x		48
A19	8						39	27	1(blk slip int)				x	75
A20	6						24	15					x	45
LOCATION	SHELL				SAND/SHELL		SAND						TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM	DEC	SAND/GROG	GROG	FC	P	
A21	1						19	12				x		32
A22	7						17	8				x		32
A23							5	1	1 (nail punct)					7
A24							3	1						4
A25	3						3							6
A26							1							1
LOCATION	SHELL				SAND/SHELL		SAND						TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM	DEC	SAND/GROG	GROG	FC	P	
B1	2						3	8				x	x	13
B2	1						8	12						21
B3	1						11	2						14
B4	6				1		12	6				x		25
B5	17						23	13				x		53
B6	18						54	58				x	x	130
B7	19						50	62				x	x	131
B8	34						35	37	3 (wh & blk slip)			x	x	107
B9	6						12	3				x	x	21
B10	5						5	1				x		11
B12	2						4	1				x		7
B13	2						11	4					x	17
B14	1						18	3					x	22
B15	3				1		10	2			2	x	x	18

LOCATION	SHELL				SAND/SHELL		SAND	SAND/GROG		GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM	DEC				
B16	1						9	3				x	13
B17	4						7	6			x		17
B18	3						7	3			x		13
B19	1						6	3					10
B20							5	2					7
LOCATION	SHELL				SAND/SHELL		SAND	SAND/GROG		GROG	FC	P	TOTAL
	PL	OTR	VR	RS	PL	DEC	PL	CDM	DEC				
TOTAL	170		1		2	1	506	342	6		2		1030

Table E11. Lithics Collected in Controlled Surface Collections, 3MS504.

ABBREVIATIONS USED: PP=Projectile Point/knife; UB=Utilized Biface;A=Adz; PRE=Preform; DR=Drill; UF=Utilized Flake; B=Biface; H=Hammerstone; AB=Abrader; C=CORES; TC=Tested Cobble; PFLK=Primary Decortication Flake; SFLK=Secondary Decortication Flake; IFLK=Interior Flake or Pressure Flake; BT= Bifacial Thinning Flake; FCR=Fire Cracked Rock; UM=Unmodified Cobbles, Stones or Angular Fragments.

UNIT	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	BT	FCR	UM	TOTAL
A5														1				1
A9													1					1
A14															1			1
A15														1			2	3
A16														1			2	3
A17														1				1
A19														2				2
A20													1				1	2
A21													2				1	3
A22														1				1
A24															1			1
B1														2			1	3
B2																	2	2
B4																	1	1
B5																1	2	3
B6																	2	2
B7														3	2		3	8
B8													2	1		1		4
B13												1	1	3			2	7
B14													1	3	1		1	6
B16		1											2					3
B17													1	2				3
B18														1			1	2
B20														2			15	17
DEPTH	PP	UB	A	PRE	DR	UF	B	H	AB	C	TC	PFLK	SFLK	IFLK	BT	FCR	UM	TOTAL
TOTAL	1											1	11	24	5	2	36	80

APPENDIX F: Scope of Work

SECTION C - DESCRIPTION/SPECIFICATIONS (SCOPE OF WORK)

C-1. GENERAL.

C-1.1. The Contractor shall conduct a background and literature search, an intensive survey investigation, a geomorphic study, and initial site testing along Ditches 7 and 13, and Lower Buffalo Creek in Mississippi and Craighead Counties, Arkansas. Reports of these investigations shall be submitted. These tasks are in partial fulfillment of the Memphis District's obligations under the National Historic Preservation Act of 1966 (P.L. 89-665), as amended; the National Environment Policy Act of 1969 (P.L. 91-190); Executive Order 11593, "Protection and Enhancement of Cultural Environment," 13 May 1971 (36 CFR Part 800); Preservation of Historic and Archeological Data, 1974 (P.L. 93-291), as amended; and the Advisory Council on Historic Preservation, "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

C-1.2. Personnel Standards.

a. The Contractor shall utilize a systematic, interdisciplinary approach to conduct the study. Specialized knowledge and skills will be used during the course of the study to include expertise in archeology, history, architecture, geology and other disciplines as required to fulfill requirements of this Scope of Work. Techniques and methodologies used for the study shall be representative of the state of current professional knowledge and development.

b. The following minimal experiential and academic standards shall apply to personnel involved in investigations described in this Scope of Work.

(1) Archeological Project Directors or Principal Investigator(s) (PI). Individuals in charge of an archeological project or research investigation contract, in addition to meeting the appropriate standards for archeologist, must have a publication record that demonstrates extensive experience in successful field project formulation, execution and technical monograph reporting. It is mandatory that at least one individual acting as Principal Investigator or Project Director under this contract have demonstrated competence and ongoing interest in comparable cultural resources or archeological research in the Northeast Arkansas Region. Extensive prior research experience as Principal Investigator or Project Director in immediately adjacent areas will also satisfy this requirement. The requirement may also be satisfied by utilizing consulting Co-principal Investigators averaging no less than 24 paid hours per month for the duration of contract activities. Changes in any Project Director or Principal Investigator must be approved by the Contracting Officer. The Contracting Officer may require suitable professional references to obtain estimates regarding the adequacy of prior work.

(2) Archeologist. The minimum formal qualifications for individuals practicing archeology as a profession are a B.A. or B.S. degree from an accredited college or university, followed by a minimum of two years of successful graduate study or equivalent with concentration in anthropology and specialization in archeology and at least two summer field schools or

their equivalent under the supervision of archeologists of recognized competence. A Master's thesis or its equivalent in research and publication is highly recommended, as is the M.A. degree.

(3) Architectural Historian. The minimum professional qualifications in architectural history are a graduate degree in architectural history, historic preservation, or closely related fields, with course work in American architectural history; or a bachelor's degree in architectural history, historic preservation, or closely related field plus one of the following:

(a) At least two years full-time experience in research, writing, or teaching in American history or restoration architecture with an academic institution, historical organization or agency, museum, or other professional institution; or

(b) Substantial contribution through research and publication to the body of scholarly knowledge in the field of American architectural history.

(4) Other Professional Personnel. All other personnel utilized for their special knowledge and expertise must have a B.A. or B.S. degree from an accredited college or university, followed by a minimum of two years of successful graduate study with concentration in appropriate study and a publication record demonstrating competing in the field of study.

(5) Other Supervisory Personnel. Persons in any supervisory position must hold a B.A., B.S. or M.A. degree with a concentration in the appropriate field of study and a minimum of 2 years of field and laboratory experience in tasks similar to those to be performed under this contract.

(6) Crew Members and Lab Workers. All crew members and lab workers must have prior experience compatible with the tasks to be performed under this contract. An academic background in the appropriate field of study is highly recommended.

c. All operations shall be conducted under the supervision of qualified professionals in the discipline appropriate to the data that is to be discovered, described or analyzed. Vitae of personnel involved in project activities may be required by the Contracting Officer at anytime during the period of service of this contract.

C-1.3. The Contractor shall designate in writing the name or names of the Principal Investigator(s). Participation time of the Principal Investigator(s) shall average a minimum of 50 hours per month during the period of service of this contract. In the event of controversy or court challenge, the Principal Investigator shall be available to testify with respect to report findings. The additional services and expenses would be at Government expense, per paragraph 1.8 below.

C-1.4. The Contractor shall keep standard field records which may be reviewed by the Contracting Officer. These records shall include field notes, appropriate state site survey forms and any other cultural resource forms and/or records, field maps and photographs necessary to successfully implement requirements of this Scope of Work.

C-1.5. To conduct the field investigation, the Contractor will obtain all necessary permits, licenses; and approvals from all local, state and Federal authorities. Should it become necessary in the performance of the work and services of the Contractor to secure the right of ingress and egress to perform any of the work required herein on properties not owned or controlled by the Government, the Contractor shall secure the consent of the owner, his representative, or agent, prior to effecting entry on such property.

C-1.6. Innovative approaches to data location, collection, description and analysis, consistent with other provisions of this contract and the cultural resources requirements of the Memphis District, are encouraged.

C-1.7. No mechanical power equipment other than that referenced in paragraph C-4.5 shall be utilized in any cultural resource activity without specific written permission of the Contracting Officer.

C-1.8. The Contractor shall furnish expert personnel to attend conferences and furnish testimony in any judicial proceedings involving the archeological and historical study, evaluation, analysis and report. When required, arrangements for these services and payment therefor will be made by representatives of either the Corps of Engineers or the Department of Justice.

C-1.9. The Contractor, prior to the acceptance of the final report, shall not release any sketch, photograph, report or other material of any nature obtained or prepared under this contract without specific written approval of the Contracting Officer.

C-1.10. The extent and character of the work to be accomplished by the Contractor shall be subject to the general supervision, direction, control and approval of the Contracting Officer. The Contracting Officer may have a representative of the Government present during any or all phases of Scope of Work requirements.

C-1.11. The Contractor shall obtain Corps of Engineers Safety Manual (EM 385 -1-1) and comply with all appropriate provisions. Particular attention is directed to safety requirements relating to the deep excavation of soils.

C-1.12. There will be two categories of meetings between Contractor and Contracting Officer: (1) scheduled formal conferences to review contract performance, and (2) informal, unscheduled meetings for clarification, assistance, coordination and discussion. The initial meeting shall be held prior to the beginning of field work. Category (1) meetings will be scheduled by the Contracting Officer and will be held at the most convenient location, to be chosen by the Contracting Officer. This may sometimes be on the project site, but generally will be at the office of the Contracting Officer.

C-2. STUDY AREA.

The construction project area consists of approximately 11.2 miles (18.0 kilometers) of channel work along Ditch 7 in Mississippi County,

Arkansas, approximately 11.2 miles (18.0 kilometers) of channel work along Ditch 13 in Mississippi County, Arkansas and approximately 16.1 miles (25.9 kilometers) of construction work along Lower Buffalo Creek/Ditch 4 in Mississippi and Craighead Counties, Arkansas. The following are study segments associated with each construction area.

1. Ditch 7, Segment 1. (See attached map.) The Ditch 7, Segment 1 study area extends from the juncture of Ditch 7 and Buffalo Creek Ditch eastward to the West Project Levee for the Little River Floodway. The study area in this segment consists of transects paralleling Ditch 7 and extending from both the north and south top ditch banks landward for 200 feet (61 meters) (i.e. 200 feet on each side of Ditch 7).

2. Ditch 7, Segment 2. (See attached map.) This portion of Ditch 7 extends from the juncture of Ditch 7 and the West Project Levee for the Little River Floodway northward to Ditch 13. The study area in Segment 2 consists of a transect paralleling the West Project Levee and extending from 20 feet (6.1 meters) west of the west crown of the levee westward 350 feet (107.7 meters).

3. Ditch 13, Segment 1. (See attached map.) This portion of Ditch 13 begins at the juncture of Ditch 13 and Buffalo Creek Ditch and extends eastward to the West Project Levee for the Little River Floodway. The study area for Ditch 13, Segment 1 consists of transects paralleling Ditch 7 and extending from both the north and south top ditch banks landward for 200 feet (61 meters) (i.e. 200 feet on each side of Ditch 7).

4. Ditch 13, Segment 2. (See attached map.) This segment of the Ditch 13 study area extends from the juncture of Ditch 13 and the West Project Levee of the Little River Floodway northward to the juncture of the levee and Ditch 12. The Study area for Segment 2 consists of a transect paralleling the West Project Levee and extending from 20 feet (6.1 meters) west of the west crown of the levee westward 350 feet (107.7 meters).

5. Lower Buffalo Creek/Ditch 4. (See attached map.) This survey item extends from the inlet headwall of Rivervale Culvert northward along Ditch 4/Buffalo Creek Ditch to the juncture of Ditch 13. The study area consists of transects paralleling Buffalo Creek Ditch/Ditch 4 and extending from both top banks landward 200 feet (61 meters) (i.e. 200 feet on each side of Buffalo Creek Ditch).

C-3. DEFINITIONS.

C-3.1. "Cultural resources" are defined to include any building, site, district, structure, object, data, or other material relating to the history, architecture, archeology, or culture of an area.

C-3.2. "Background and Literature Search" is defined as a comprehensive examination of existing literature and records for the purpose of inferring the potential presence and character of cultural resources in the study area. The examination may also serve as collateral information to field data in evaluating the eligibility of cultural resources for inclusion in the

National Register of Historic Places or in ameliorating losses of significant data in such resources.

C-3.3. "Intensive Survey" is defined as a comprehensive, systematic, and detailed on-the-ground survey of an area, of sufficient intensity to determine the number, types, extent and distribution of cultural resources present and their relationship to project features.

C-3.4. "Mitigation" is defined as the amelioration of losses of significant prehistoric, historic, or architectural resources which will be accomplished through preplanned actions to avoid, preserve, protect, or minimize adverse effect upon such resources or to recover a representative sample of the data they contain by implementation of scientific research and other professional techniques and procedures. Mitigation of losses of cultural resources includes, but is not limited to, such measures as: (1) recovery and preservation of an adequate sample of archeological data to allow for analysis and published interpretation of the cultural and environmental conditions prevailing at the time(s) the area was utilized by man; (2) recording, through architectural quality photographs and/or measured drawings of buildings, structures, districts, sites and objects and deposition of such documentation in the Library of Congress as a part of the National Architectural and Engineering Record; (3) relocation of buildings, structures and objects; (4) modification of plans or authorized projects to provide for preservation of resources in place; (5) reduction or elimination of impacts by engineering solutions to avoid mechanical effects of wave wash, scour, sedimentation and related processes and the effects of saturation.

C-3.5. "Reconnaissance" is defined as an on-the-ground examination of selected portions of the study area, and related analysis adequate to assess the general nature of resources in the overall study area and the probable impact on resources of alternate plans under consideration. Normally reconnaissance will involve the intensive examination of not more than 15 percent of the total proposed impact area.

C-3.6. "Significance" is attributable to those cultural resources of historical, architectural, or archeological value when such properties are included in or have been determined by the Secretary of the Interior to be eligible for inclusion in the National Register of Historic Places after evaluation against the criteria contained in 36 CFR 63.

C-3.7. "Testing" is defined as the systematic removal of the scientific, prehistoric, historic, and/or archeological data that provide an archeological or architectural property with its research or data value. Testing may include controlled surface survey, shovel testing, profiling, and limited subsurface test excavations of the properties to be affected for purposes of research planning, the development of specific plans for research activities, excavation, preparation of notes and records, and other forms of physical removal of data and the material analysis of such data and material, preparation of reports on such data and material and dissemination of reports and other products of the research. Subsurface testing shall not proceed to the level of mitigation.

C-3.8. "Analysis" is the systematic examination of material data, environmental data, ethnographic data, written records, or other data which may be prerequisite to adequately evaluating those qualities which contribute to their significance.

C-4. GENERAL PERFORMANCE SPECIFICATIONS.

C-4.1. Research Design.

Survey and testing will be conducted within the framework of a regional research design including, where appropriate, questions discussed in the State Plan. All typological units not generated in these investigation, shall be adequately referenced. It should be noted that artifactual typologies constructed for other areas may or may not be suitable for use in the study area. It is, therefore, of great importance that considerable effort be spent in recording and describing artifactual characteristics treated as diagnostic in this study as well as explicit reasons for assigning (or not assigning) specific artifacts to various classificatory units.

C-4.2. Background and Literature Search.

a. This task shall include an examination of the historic and prehistoric environmental setting and cultural background of the study area and shall be of sufficient magnitude to achieve a detailed understanding of the overall cultural and environmental context of the study area. It is axiomatic that the background and literature search shall normally precede the initiation of all fieldwork.

b. Information and data for the literature search shall be obtained, as appropriate, from the following sources: (1) Scholarly reports - books, journals, theses, dissertations and unpublished papers; (2) Official Records - Federal, state, county and local levels, property deeds, public works and other regulatory department records and maps; (3) Libraries and Museums - both regional and local libraries, historical societies, universities, and museums; (4) Other repositories - such as private collections, papers, photographs, etc.; (5) Archeological site files at local universities, the State Historic Preservation Office, the office of the State Archeologist; (6) Consultation with qualified professionals familiar with the cultural resources in the area, as well as consultation with professionals in associated areas such as history, sedimentology, geomorphology, agronomy, and ethnology.

c. The Contractor shall include as an appendix to the draft and final reports, written evidence of all consultation and any subsequent responses(s), including the dates of such consultation and communications.

d. The background and literature search shall be performed in such a manner as to facilitate the construction of predictive statements (to be included in the study report) concerning the probable quantity, character, and distribution of cultural resources within the project area. In addition, information obtained in the background and literature search should be of such scope and detail as to serve as an adequate data base for subsequent field work and analysis in the study area undertaken for the purpose of discerning the character, distribution and significance of specific identified cultural resources.

C-4.3. Intensive Survey.

a. Intensive survey shall include the on-the-ground examination of the study areas described in paragraph C-2 with examination intervals no greater than 30 meters.

b. Unless excellent ground visibility and other conditions conducive to the observation of cultural evidence occurs, shovel test pits, or comparable subsurface excavation units, shall be installed at intervals no greater than 30 meters throughout the study area. Note that auger samples, probes, and coring tools will not be considered comparable subsurface units. Shovel test pits shall be minimally 30 x 30 centimeters in size and extend to a minimum depth of 50 centimeters. Unit fill material shall be screened using 1/4" mesh hardware cloth. Additional shovel test pits shall be excavated in areas judged by the Principal Investigator to display a high potential for the presence of cultural resources. If, during the course of intensive survey activities, areas are encountered in which disturbance or other factors clearly and decisively preclude the possible presence of significant cultural resources, the Contractor shall carefully examine and document the nature and extent of the factors and then proceed with survey activities in the remainder of the study area. Documentation and justification of such action shall appear in the survey report. The location of all shovel test units and surface observations shall be recorded.

c. When cultural remains are encountered, horizontal site boundaries shall be derived by the use of surface observation procedures (including controlled surface collection procedures described in Paragraph C-4.4.a. below) in such a manner as to allow precise location of site boundaries on Government project drawings and 7.5 minute U.S.G.S. quad maps when available. Methods used to establish site boundaries shall be discussed in the survey report together with the probable accuracy of the boundaries. The Contractor shall establish a datum at the discovered cultural loci which shall be precisely related to the site boundaries as well as to a permanent reference point (in terms of azimuth and distance) by means of a transit level. If possible, the permanent reference point used shall appear on Government blueline (project) drawings and/or 7.5 minute U.S.G.S. quad maps. If no permanent landmark is available, a permanent datum shall be established in a secure location for use as a reference point. The permanent datum shall be precisely plotted and shown on U.S.G.S. quad maps and project drawings. All descriptions of site location shall refer to the location of the primary site datum.

d. All standing buildings and structures (other than those patently modern, i.e., less than 50 years old) shall be recorded and described. For a building to be considered "standing" it must retain four walls and at least a skeletal roof structure. A building or structure found in the field to be partially or totally collapsed will be considered an archeological site. In these cases, data concerning construction materials and techniques and floor plan, if discernible, must be collected. The Contractor shall supply preliminary information concerning the suitability of a structure or building for relocation and restoration (structural soundness for example).

C-4.4. Testing Activities.

a. Initial Site Testing.

(1) Surface collection of the site area shall be accomplished in order to obtain data representative of total site surface content. Both historic and prehistoric items shall be collected. The Contractor shall carefully note and record descriptions of surface conditions of the site including ground cover and the suitability of soil surfaces for detecting cultural items (ex: recent rainfall, standing water or mud). If ground surfaces are not highly conducive to surface collection, screened shovel tests units shall be used to augment surface collection procedures. It should be noted, however, that such units should be substituted for total surface collection only where the presence of ground cover requires such techniques.

(2) Care should be taken to avoid bias in collecting certain classes of data or artifact types to the exclusion of others (ex: debitage or faunal remains) so as to insure that collections accurately reflect both the full range and the relative proportions of data classes present (ex: the proportion of debitage to finished implements or types of implements to each other). Such a collecting strategy shall require the total collection of quadrat or other sample units in sufficient quantities to reasonably assure that sample data are representative of such discrete site subareas as may exist. Since the number and placement of such sample units will depend, in part, on the subjective evaluation of intrasite variability, and the amount of ground cover, the Contractor shall describe the rationale for the number and distribution of collection units. In the event that the Contractor utilizes systematic sampling procedures in obtaining representative surface samples, care should be taken to avoid periodicity in recovered data. No individual sample unit type used in surface data collection shall exceed 36 square meters in area. Unless a smaller fraction is approved by the Contracting Officer, surface collected areas shall constitute no less than 25 percent of total site areas. Detailed results of controlled surface collections shall be graphically depicted in plan view in the report of investigations.

(3) The Contractor shall undertake (in addition and subsequent to sample surface collecting) a general site collection in order to increase the sample size of certain classes of data which the Principal Investigator may deem prerequisite to an adequate site-specific and intersite evaluation of data.

(4) As an alternative to surface collecting procedures discussed above, where surface visibility is excellent, the Contractor may collect all visible artifacts. If such a procedure is undertaken, the precise proveniences of all individual artifacts shall be related to the primary site datum by means of a transit level.

(5) Unless it can be conclusively demonstrated that no significant subsurface cultural resources occur at a site, the Contractor shall install in each appropriate site a minimum of one 1 X 1 meter subsurface test unit to determine the general nature of subsurface deposits.

(6) Subsurface test units (other than shovel cut units) shall be excavated in levels no greater than 10 centimeters. Where cultural zonation or plow disturbance is present however, excavated materials shall be removed by zones (and in 10 cm. levels within zones where possible). Subsurface test units shall extend to a depth of at least 20 centimeters below artifact bearing soils. A portion of each test unit, measured from one corner (of a minimum 30 X 30 centimeters), shall be excavated to a depth of 40 centimeters below artifact bearing soils. All excavated material (including plow zone material) shall be screened using a minimum of 1/4" hardware cloth. Representative profile drawings shall be made of excavated unit. Subsequent to preparation of profile drawings for each test unit, the unit snall be backfilled and compacted to provide reasonable pedestrian safety.

(7) Stringent horizontal spatial control of testing shall be maintained by relating the location of all collection and test units to the primary site datum either by means of a grid system (including those used in controlled surface collection) or by azimuth and distance.

(8) Other types of subsurface units may, at the Contractor's option, be utilized in addition to those units required by this Scope of Work.

(9) Cultural Resource Recording and Numbering. For each archeological site or architectural property recorded during the survey, the Contractor shall complete and submit the standard Arkansas archeological site or architectural property survey form, respectively. The Contractor shall be responsible for reproducing or obtaining a sufficient quantity of these forms to meet the needs of the project. The Contractor shall be responsible for coordinating with the appropriate state agency to obtain state site-file numbers for each archeological site and architectural property recorded.

b. Additional Investigations.

(1) Additional subsurface test units maybe required at many loci. The proposed number and distribution of such test units shall be recommended by the Principal Investigator on a site specific basis. This recommendation shall be made based on such variables as site size and potential intrasite variability, including, physiographic and geomorphic characteristics of the loci which may suggest variability in the presence or distribution of subsurface cultural deposits. The Contractor shall detail the rationale(s) for the placement and numbers of proposed test units in the management summary and report of field activities. Additional reporting requirements, examination of background literature and examination of standing buildings and structures may also be required at some sites. The exact nature of additional examination, the schedule, and the price of the work shall be negotiated with the Contracting Officer, and if an agreement is reached, a Change Order shall be issued prior to conduct of the work. Additional investigations will provide a data base of sufficient nature to allow determination of site eligibility to the National Register of Historic Places consistent with C-5.3.j.12) and (3) of this Scope of Work.

(2) In order to accurately relate a site to research domains, (i.e. assess significance or insignificance), a variety of data gathering

techniques may be required to insure recovery of the various types of data which may be present at the site. These techniques may include radiocarbon dating, flotation and excavation of cultural features. When appropriate, these types of data gathering activities should be integral elements of the testing strategy.

C-4.5. Geomorphological Study.

The Contractor shall undertake geomorphic examinations of the study area in order to determine the probability of the presence of significant subsurface cultural resources and the likely location and nature of those resources. The study shall focus on data relating to the age and nature of of soil deposits in the study area and the implications of those data regarding the probable presence, location, age and nature of significant cultural resources associated with these soils.

(1) The Contractor shall obtain sufficient field samples attributable to various temporal horizons to insure statistically reliable data for a minimum of two (2) palynological columns collected in such a manner as to allow taxa to be interpreted in paleoecological and paleoclimatic terms. Biostratigraphic chronological data shall be established by means of geomorphic and radiocarbon analysis. Obtaining suitable samples allowing the definition of continuous paleoenvironmental sequences during the full temporal range of human occupation of the study area shall be a prime consideration in the selection of sampling locations. Analysis of collected data shall be undertaken to supply a data base for the determination of the potential types and significance of buried cultural resources in the study area.

(2) The Contractor shall utilize hand excavation, power excavation and power coring equipment, as appropriate, to insure adequate depth and penetration of soils in the collection of data required for all investigative purposed described in paragraph C-4.5 of this Scope of Work.

(3) Investigations shall not include soils which are known to predate possible human occupation. All sampling areas shall be such as to yield data applicable to study areas.

(4) Investigations shall include carefully reasoned and documented recommendations and conclusions concerning:

a. the potential of the study area to contain buried significant cultural resources.

b. specific areas likely to contain significant cultural deposits and those unlikely to contain such deposits.

c. the likely nature of buried cultural deposits in the study area.

d. the need or lack of need for deep archeological testing in the study area.

e. if appropriate, a sampling plan for deep archeological testing including the numbers, type and location of proposed deep testing units.

(5) Although limited geological field observations and testing will be necessary to obtain data, it is not anticipated that extensive subsurface testing will be required. If additional deep archeological testing is deemed necessary by the Contractor, the number, placement, techniques, time requirements and cost to the Government of such testing shall be negotiated with the Contracting Officer, and if an agreement is reached, a Change Order shall be issued prior to the conduct of the work.

C-4.6. Laboratory Processing, Analysis, and Preservation.

All cultural materials recovered will be cleaned and stored in deterioration resistant containers suitable for long term curation. Diagnostic artifacts will be labeled and catalogued individually. A diagnostic artifact is defined herein as any object which contributes individually to the needs of analysis required by this Scope of Work or the research design. All other artifacts recovered must minimally be placed in labeled, deterioration resistant containers, and the items catalogued. The Contractor shall describe and analyze all cultural materials recovered in accordance with current professional standards. Artifactual and non-artifactual analysis shall be of an adequate level and nature to fulfill the requirements of this Scope of Work. All recovered cultural items shall be catalogued in a manner consistent with Arkansas state requirements. The Contractor shall consult with appropriate state officials as soon as possible following the conclusion of field work in order to obtain information (ex: accession numbers) prerequisite to such cataloging procedures.

C-4.7. Curation.

Efforts to insure the permanent curation of properly cataloged cultural resources materials and project documentation in an appropriate institution shall be considered an integral part of the requirements of this Scope of Work. The Contractor shall pay all cost of the preparation and permanent curation of records and artifacts. An arrangement for curation shall be confirmed by the Contractor, subject to the approval of the Contracting Officer, prior to the acceptance of the final report.

C-5. GENERAL REPORT REQUIREMENTS.

C-5.1. The primary purpose of the cultural resources report is to serve as a planning tool which aids the Government in meeting its obligations to preserve and protect our cultural heritage. The report will be in the form of a comprehensive, scholarly document that not only fulfills mandated legal requirements but also serves as a scientific reference for future cultural resources studies. As such, the report's content must be not only descriptive but also analytic in nature.

C-5.2. Upon completion of all field investigation and research, the Contractor shall prepare a report detailing the work accomplished, the results, and recommendations for each project area. Copies of the draft and

final reports of investigation shall be submitted in a form suitable for publication and be prepared in a format reflecting contemporary organizational and illustrative standards for current professional archeological journals. The final report shall be typed on standard size 8-1/2" x 11" bond paper with pages numbered and with page margins one inch at top, bottom, and sides. Photographs, plans, maps, drawings and text shall be clean and clear.

C-5.3. The report shall include, but not necessarily be limited to, the following sections and items:

a. Title Page. The title page should provide the following information; the type of task undertaken, the study areas and cultural resources which were assessed; the location (county and state), the date of the report; the contract number; the name of the author(s) and/or the Principal Investigator; and the agency for which the report is being prepared. If a report has been authored by someone other than the Principal Investigator, the Principal Investigator must at least prepare a foreword describing the overall research context of the report, the significance of the work, and any other related background circumstances relating to the manner in which the work was undertaken.

b. Abstract. an abstract suitable for publication in an abstract journal shall be prepared and shall consist of a brief, quotable summary useful for informing the technically-oriented professional public of what the author considers to be the contributions of the investigation to knowledge.

c. Table of Contents.

d. Introduction. This section shall include the purpose of the report, a description of the proposed project, a map of the general area, a project map, and the dates during which the investigations were conducted. The introduction shall also contain the name of the institution where recovered materials and documents will be curated.

e. Environmental Context. This section shall contain, but not be limited to, a discussion of probable past floral, faunal, and climatic characteristics of the project area. Since data in this section may be used in the evaluation of specific cultural resource significance, it is imperative that the quantity and quality of environmental data be sufficient to allow subsequent detailed analysis of the relationship between past cultural activities and environmental variables.

f. Previous Research. This section shall describe previous research which may be useful in deriving or interpreting relevant background data, problem domains, or research questions and in providing a context in which to examine the probability of occurrence and significance of cultural resources in the study area.

g. Literature Search and Personal Interviews. This section shall discuss the results of the literature search, including specific data sources, and personal interviews which were conducted during the course of investigations.

i. Survey, Testing and Analytical Methods. This section shall contain an explicit discussion of the research design, and shall demonstrate how environmental data, previous research data, the literature search and personal interviews have been utilized in constructing the strategy. Specific research domains and questions as well as methodological strategies employed to address those questions should be included where possible.

j. Recommendations.

(1) This section should contain, where possible, assessments of the eligibility of specific cultural properties in the study area for inclusion in the National Register of Historic Places.

(2) Significance should be discussed explicitly in terms of previous regional and local research and relevant problem domains. Statements concerning significance shall contain a detailed, well-reasoned argument for the property's research potential in contributing to the understanding of cultural patterns, processes or activities important to the history or prehistory of the locality, region or nation, or other criteria of significance. Conclusions concerning insignificance likewise, shall be fully documented and contain detailed and well-reasoned arguments as to why the property fails to display adequate research potential or other characteristics adequate to meet National Register criteria of significance. For example, conclusions concerning significance or insignificance relating solely to the lack of contextual integrity due to plow disturbance or the lack of subsurface deposits will be considered inadequate. Where appropriate, due consideration should be given to the data potential of such variables as site functional characteristics, horizontal intersite or intrasite spatial patterning of data and the importance of the site as a representative systemic element in the patterning of human behavior. All report conclusions and recommendations shall be logically and explicitly derived from data discussed in the report.

(3) The significance or insignificance of cultural resources can be determined adequately only within the context of the most recent available local and regional data base. Consequently the evaluation of specific individual cultural loci examined during the course of contract activities shall relate these resources not only to previously known cultural data but also to a synthesized interrelated corpus of data including those data generated in the present study.

(4) Where appropriate, the Contractor shall provide alternative mitigation measures for significant resources which will be adversely impacted. Data will be provided to support the need for mitigation and the relative merits of each mitigation design will be discussed. Preservation of significant cultural resources is nearly always considered preferable to recovery of data through excavation. When a significant site can be preserved for an amount reasonably comparable to, or less than the amount required to recover the data, full consideration shall be given to this course of action.

k. References (American Antiquity Style).

l. Appendices (Maps, Correspondence, etc.). A copy of this Scope of Work and, when stipulated by the Contracting Officer, review comments shall be included as appendices to the final report of investigations.

C-5.4. The above items do not necessarily have to be discrete sections; however, they should be readily discernible to the reader.

C-5.5. In order to prevent potential damage to cultural resources, no information shall appear in the body of the report which would reveal precise resource location. All maps which indicate or imply precise site locations shall be included in reports as a readily removable appendix (e.g. envelope).

C-5.6. No logo or other such organizational designation shall appear in any part of the report (including tables or figures) other than the title page.

C-5.7. Unless specifically otherwise authorized by the Contracting Officer, all reports shall utilize permanent site numbers assigned by the state in which the study occurs.

C-5.8. All appropriate information (including typologies and other classificatory units) not generated in these contract activities shall be suitably referenced.

C-5.9. Reports shall contain site specific maps. Site maps shall indicate site datum(s), location of data collection units (including shovel cuts, subsurface test units and surface collection units), site boundaries in relation to proposed project activities, site grid systems (where appropriate), and such other items as the Contractor may deem appropriate to the purposes of this contract.

C-5.10. Information shall be presented in textual, tabular, and graphic forms, whichever are most appropriate, effective and advantageous to communicate necessary information. All tables, figures and maps appearing in the report shall be of publishable quality.

C-5.11. Any abbreviated phrases used in the text shall be spelled out when the phrase first occurs in the text. For example use "State Historic Preservation Officer (SHPO)" in the initial reference and thereafter "SHPO" may be used.

C-5.12. The first time the common name of a biological species is used it should be followed by the scientific name.

C-5.13. In addition to street addresses or property names, sites shall be located on the Universal Transverse Mercator (UTM) grid.

C-5.14. Generally, all measurements should be metric.

C-5.15. As appropriate, diagnostic and/or unique artifacts, cultural resources or their contexts shall be shown by drawings or photographs.

C-5.16. Black and white photographs are preferred except when color changes are important for understanding the data being presented. No instant type photographs may be used.

C-5.17. Negatives of all black and white photographs and/or color slides of all plates included in the final report shall be submitted to the Contracting Officer.

C-6. SUBMITTALS.

C-6.1. An extensive management summary shall be submitted, in accordance with the schedule in paragraph C-7.1, to the Contracting Officer within 14 days of the completion of survey and initial testing. The management summary shall describe survey and initial testing methods and the data yielded by those methods. Where survey data, initial testing data and other sources of data are adequate, the Contractor shall evaluate cultural resources identified during survey activities in terms of eligibility for inclusion in the National Register of Historic Places. The evaluation shall be consistent with requirements in paragraph C-5.3.j. of this Scope of Work. Where inadequate data exist for such an evaluation, the Contractor shall recommend specific additional studies, as described in paragraph C-4.4.b. of this Scope of Work, necessary to obtain adequate data for such National Register evaluation. The management summary shall include project maps showing boundaries of discovered cultural resources relative to project rights-of-way. The management summary shall also contain recommendations, based on geomorphic and other data, concerning the need for deep cultural resources testing and the type, numbers and locations of needed deep test units.

C-6.2. The Contractor shall submit 6 copies of the draft report and one original and 75 copies with high quality binding, of the final report which include appropriate revisions in response to the Contracting Officer's comments.

C-6.3. The Contractor shall submit under separate cover 6 copies of appropriate 15' quadrangle maps (7.5' when available) or other site drawings which show exact boundaries of all cultural resources within the project area and their relationship to project features.

C-6.4. The Contractor shall submit to the Contracting Officer completed National Register forms including photographs, maps, and drawings in accordance with the National Register Program, if any sites inventoried during the survey are found to meet the criteria of eligibility for nomination and for determination of significance. The completed National Register forms shall be submitted with the final report.

C-6.5. At any time during the period of service of this contract, upon the written request of the Contracting Officer, the Contractor shall submit, within 15 calendar days, any portion or all field records described in paragraph C-1.4 without additional cost to the Government.

C-6.6. When cultural resources are located during intensive survey activities, the Contractor shall supply the appropriate State Historic

Preservation Office with completed site forms, survey report summary sheets, maps or other forms as appropriate. Blank forms may be obtained from the State Historic Preservation Office. Copies of such completed forms and maps shall be submitted to the Contracting Officer within 30 calendar days of the end of fieldwork.

C-6-7. The Contractor shall prepare and submit with the final report, a site card for each identified resource or aggregate resource. These site cards do not replace state approved prehistoric, historic, or architectural forms or Contractor designed forms. These 5 X 8 inch cards shall be color-coded. White cards shall be used for prehistoric sites, blue cards for historic sites, green for architectural sites and yellow cards for potentially significant sites. Sites fitting two or more categories will have two or more appropriate cards. This site card shall contain the following information, to the degree permitted by the type of study authorized:

a. Site number

b. Site name

c. Location: section, township, and UTM coordinates (for procedures in determining UTM coordinates, refer to How to Complete National Register Forms, National Register Program, Volume 2.

d. County and state

e. Quad maps

f. Date of record

g. Description of site

h. condition of site

i. Test excavation results

j. Typical artifacts

k. Chronological position (if known)

l. Relation to project

m. Previous studies and present contract number

n. Additional remarks

C-6.8. Documentation. The Contractor shall submit detailed monthly progress reports to the Contracting Officer by the 7th day of every month for the duration of the contract. These reports will contain an accurate account of all field work, laboratory procedures and results in sufficient detail to allow monitoring of project progress.

C-7. SCHEDULE.

C-7.1. The Contractor shall, unless delayed due to causes beyond his control and without his fault or negligence, complete all work and services under this contract within the following time limitations.

Activity	Completion Time (In calendar days beginning with acknowledged date of receipt of notice to proceed)
Survey/Initial Testing Fieldwork	60
Submittal Management Summary	74
Submittal of Draft Report of Investigations	164
Submittal of Final Report of Investigations	244

C-7.2. The Contractor shall make any required corrections after review by the Contracting Officer. The Contracting Officer may defer Government review comments pending receipt of review comments from the State Historic Preservation Officer or other reviewing agencies. More than one series of draft report corrections may be required. In the event that the government review period (50 days) is exceeded and upon request of the Contractor, the contract period will be extended automatically on a calendar day for day basis. Such extension shall be granted at no additional cost to the Government.

APPENDIX G: Project Personnel

Carol S. Spears served as Co-Director for this Project. Spears has been involved in southeastern archeology for almost 15 years. She received her M. A. degree in anthropology with specializations in southeastern prehistory and cultural resource management from the University of Arkansas. Since that time she has participated in projects in Arkansas, Missouri, Illinois, North Carolina and Yugoslavia. From 1977-1980, she was an archeologist for the State of North Carolina and directed both their public education and National Register programs. From 1980-1985, she worked as a consultant for several private and state agencies and directed numerous projects around the state. In January 1986, she established her own firm, Spears Professional Environmental and Archeological Research Service (SPEARS) which provides quality archeological research for a reasonable cost to federal, state, and private firms in Arkansas.

Robert A. Taylor served as Co-Director for this Project. Taylor has over ten years experience in Arkansas and received his M. A. from the University of Arkansas. He has worked at a wide variety of sites throughout the state, including the Zebree Site in Mississippi County and the Frierson and Floodway Sites in Poinsett County. He has also directed projects for the Arkansas Archeological Survey and Texas A & M University Research Foundation. He has special interests in the Caddoan Indians, the philosophy of science and archeological theory. Taylor's contributions to our knowledge of prehistory in Arkansas include a study concerning the survey for buried Paleo-Indian sites in northeast Arkansas and a report on excavations at the Cryer Site, a Caddoan manifestation. He has been a Field Director and a major author on projects with SPEARS.

Michael G. Million served as Field Supervisor on this project. He has over eight years experience in Arkansas Archeology. Currently he is finishing his thesis for an M.A. degree in Anthropology at the University of Arkansas. From the early 1970's to late 1980's he was employed as a lab assistant and research assistant for the Arkansas Archeological Survey. During that time he participated in many excavations at sites such as Nodena, Sloan, and Zebree. He has special interests in ceramics and has performed numerous pottery replication experiments.

Dr. John C. Dixon is a geomorphologist, soils specialist, and faculty member of the Department of Geography at the University of Arkansas. He received his PhD. from the University of Colorado at Boulder and his M. A. from the University of Adelaide, South Australia. He has held numerous teaching posts and has received several academic awards and honors. Dr. Dixon has published in a number of areas related to geomorphology and soils, especially weathering processes. His research interest in

paleoenvironments and soil formation has led to several working and teaching associations with Arkansas archeologists and graduate students in anthropology seeking expertise in geomorphology.

Phyllis A. Morse was the project historican. She completed her graduate coursework for a PhD. at the University of Michigan. Since that time she has resided in northeast Arkansas and maintained research on the history of the area. She has authored and co-authored several major reports, manuscripts and books.

APPENDIX H: Reviews

November 3, 1987

Environmental Analysis Branch

Mr. George McCluskey
Suite 200, Heritage Center
225 East Markham
Little Rock, Arkansas 72201

Dear Mr. McCluskey:

We are enclosing a copy of a cultural resources report entitled An Archeological Survey, Initial Site Testing and Geomorphic Study of Ditches 7, 13 and Lower Buffalo Creek in Craighead, Mississippi and Poinsett Counties, Arkansas by Carol S. Spears et al, for your review and comment.

A total of 70 cultural resources loci were identified by SPEARS in this survey. Ten sites (3MS43, 3MS500, 3MS516, 3MS517, 3MS518, 3MS519, 3MS520, 3MS521, 3MS522 and 3CG918) are outside survey and construction boundaries. SPEARS believes, and we concur, that 13 survey sites (3MS41, 3MS93, 3MS493, 3MS494, 3MS497, 3MS498, 3MS502, 3MS503, 3MS506, 3PO499, 3PO500, 3PO501 and 3CG915) are eligible for inclusion in the National Register of Historic Places.

Fifteen sites (3MS510, 3MS511, 3MS512, 3MS513, 3MS514, 3MS515, 3CG916, 3CG917, Site 6, Site 10, Site 46, Site 48, Site 59, Site 60 and Site 63) are isolated finds which SPEARS and we believe to be ineligible for listing in the National Register. The Arkansas Archeological Survey has declined to issue permanent site numbers for 7 of these sites. We also agree with SPEARS that 7 sites (3MS487, 3MS488, 3MS489, 3MS490, 3MS491, Site 2 and Site 15), which consist of patently modern materials, are not eligible for inclusion in the National Register. The Arkansas Archeological Survey has declined to issue site numbers for 2 of these sites.

Twelve survey sites (3MS479, 3MS480, 3MS481, 3MS482, 3MS483, 3MS484, 3MS485, 3MS486, 3PO496, 3PO497, 3PO498 and 3CG914) consist of redeposited artifacts in dredged material, derived from previous channel construction. We concur with SPEARS that these items may reflect the presence of deeply buried, in situ archeological deposits in the immediate area. As noted below, however, all proposed

construction activities in the area of these sites will be limited to clearing operations involving no undisturbed soils, and we believe that there will be no effect on any such deeply buried cultural deposits which may exist in these areas.

Although SPEARS lists 7 additional sites as ineligible for inclusion in the National Register, we believe that inadequate data exists for such a determination for 4 of these sites (3MS492, 3MS495, 3MS508 and 3MS509). We concur with SPEARS that sites 3MS496, 3MS497W and 3MS499, are not significant in terms of National Register criteria. We also concur that an additional 6 sites (3MS501, 3MS504, 3MS505, 3MS507, 3MS211 and 3PO502) require additional data before a determination of eligibility status can be made.

In summary, we believe that of the 60 identified sites within the survey area, 13 sites are eligible for the National Register, 25 sites are not eligible, 10 sites have yielded inadequate data for eligibility determination and 12 sites, consisting of redeposited surface materials, will not be affected by project activities.

Three construction items are scheduled to take place within the cultural resources survey boundaries. Channel improvement work along Lower Buffalo Creek will be limited to clearing and cleanout work undertaken from only the west bank. Along Ditch 7, all work will be limited to the north and west banks, and restricted to clearing and channel cleanout from the juncture of Lower Buffalo Creek to mile 7.63. Work along the remaining 3.25 miles of Ditch 7 will consist of channel widening to a width of 12 feet. In order to avoid impact on site 3MS93, all work on Ditch 7 will be terminated at a point 150 meters south of that site. Along Ditch 13, work will be limited to the south bank from Lower Buffalo Creek, 4.1 miles to a point west of site 3MS41, where a crossover will be made to avoid impact to that site. The remainder of Ditch 13 work will be done from the north and east banks. Construction along Ditch 13 will be limited to clearing and cleanout from the juncture of Buffalo Creek to mile 6.32. Work along the remaining 4.18 miles of Ditch 13 will consist of channel widening to a width of 18 feet.

By adopting this construction plan, based largely on data from the SPEARS survey, and by further restricting construction right-of-way widths in some areas, all significant sites (except 3MS502 and 3MS503) and all sites lacking adequate data for eligibility determinations will be totally avoided by construction activities. We plan to gather additional data concerning sites 3MS502 and 3MS503, in the near future, in order to access potential construction effects on these sites.

We request that you concur with our conclusions and forward your

comments regarding this survey and report at your earliest convenience. It is our understanding that SPEARS is forwarding quad maps to you showing survey boundaries and site locations.

Sincerely,

Sam R. Morgan, P.E.
Chief, Planning Division

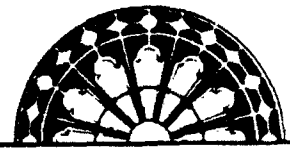
Enclosures

Copies Furnished:

Ms. Hester Davis
State Archeologist
P.O. Box 1249
Fayetteville, Arkansas 72702-1249
(w/ report)

Dr. Dan Morse
Drawer 820
Arkansas State University
Jonesboro, Arkansas 72467
(w/o report)

Ms. Carol Spears
SPEARS, Inc.
West Fork, Arkansas 72774
(w/o report)



ARKANSAS
HISTORIC
PRESERVATION
PROGRAM

December 4, 1987

Mr. Sam R. Morgan, P. E.
Chief, Planning Division
Environmental Analysis Branch
Department of the Army
Memphis District, Corps of Engineers
B-202 Clifford Davis Federal Building
Memphis, TN 38103-1894

RE: Multi County - General
Environmental Review - COE
An Archeological Survey, Initial Site Testing and Geomorphic Study of Ditches 7, 13 and Lower Buffalo Creek in Craighead, Mississippi and Poinsett Counties, Arkansas

Dear Mr. Morgan:

My staff has reviewed the above referenced report, and finds it to be thorough, comprehensive and well written. It also meets the standards for fieldwork and report writing as defined in the Arkansas State Plan. We concur with your consultant's findings, but agree with your plans for additional research and testing and recommendations for avoidance in your construction plan.

If you have any questions, please contact George McCluskey of my staff in the Arkansas Historic Preservation Program.

Sincerely,

Bill Hall

Bill Hall
Acting State Historic Preservation Officer

BH/GM/bjm

cc: Carol Spears
State Archeologist

March 21, 1988

Review of An Archeological Survey, Initial Site Testing and Geomorphic Study of Ditches 7, 13 and Lower Buffalo Creek in Craighead, Mississippi and Poinsett Counties, Arkansas, by Carol S. Spears, Robert A. Taylor , John C. Dixon Phyllis A. Morse and Michael G. Million

Introduction

Detailed itemized review comments concerning this report have been supplied to SPEARS and are not repeated in this review which is concerned with more general observations and comments regarding the project and report.

The study area for the project is located in northeast Arkansas and consisted of about 108 linear kilometers of transects varying from 60 meters to 107 meters in width.

Detailed agency requirements are discussed in the contract Scope of Work which is included in the report as Appendix G.

Review Comments

Successful Cultural Resources Management (CRM) must serve two masters - the contracting agency and the appropriate professional discipline(s). In the ideal CRM world, the requirements of both would be identical. They seldom are.

The self perceived needs of the contracting agency may represent concensus professional views of legal requirements or they may reflect bizarre, narrow, self serving agency interpretations of legal requirements. It is altogether possible that actions which meet all legitimate agency legal requirements will fall short of meeting professionally desirable research goals or standards. Appropriate or inappropriate, legally or professionally sufficient or not, perceived agency needs are codified in contract terms which are legally binding on CRM contractors.

In this regard, Price (1975) has pointed out that "Contract Archeology can be a sterile and relatively unproductive pursuit or it can be the proving ground in the application of innovative method and theory. Investigators can easily satisfy the terms of a contract but not satisfy the demands of the discipline of anthropology." Less frequently professional goals are realized but contractual obligations are not met. More frequently neither agency needs nor professional goals are met.

Perhaps the two most important questions a potential CRM contractor should ask when submitting a contract proposal are (1) "Are the terms of the proposed contract adequately flexible to satisfy both agency and professional requirements.", and (2) "Is the proposed funding level adequate for both of these purposes?" Potential contractors who cannot answer both these questions in the affirmative with relative confidence and who, nevertheless, proceed into the contractual relationship, do so at their own financial and professional peril. The time to avoid having to choose between budgetary and contractual

requirements on the one hand and professionally acceptable standards on the other is before, rather than after entering a contract.

Even after an acceptable contract has been entered, the two individual responsibilities of agency and professional needs must remain in focus as discrete project requirements. Recommendations for future actions, for example, should make very clear whether such actions are necessary to fulfill research goals, satisfy legal requirements or both. In the report by Spears et al, reviewed here, legal obligations and archeologically desirable research goals appear to be frequently indistinguishable. Recommendations regarding future fieldwork at study area sites, for example, consistently include the definition of subsurface boundaries and procurement of other data relevant to a wide variety of exciting but legally irrelevant archeological research domains.

Likewise the distinction between archeological significance and legal signficance (i.e. eligibility for inclusion in the National Register of Historic Places) tends to fade in several report discussions. Thus, the authors describe archeological components at some sites as being eligible for nomination to the National Register. In evaluating Site 3MS522, Spears et al states that "that portion of the site within the right of way does not have a high research potential and is not significant." Under cultural resources regulations, of course, only complete sites (or properties), not archeological components or portions of site properties, can be placed on the National Register.

In order to establish legal signficance, it is necessary only to demonstrate that a site contains some (virtually any) data of importance to history or prehistory. While additional data collection is frequently required to evaluate construction impact on the characteristics which give signficance to the site, or to define appropriate mitigative measures, the extent of such investigations is necessarily determined by the nature and extent of construction activities. Research at this stage of legal compliance must be aimed at determining (1) legal significance status, (2) probable effects, if any, on characteristics which lend site significance, and (3) ways to avoid such effects.

This is not to say that high quality substantive analytical research is not necessary to resource evaluation. To the contrary, it must be the heart of such a process. Furthermore, analytical synthesis of collected data with previously available local and regional information must be accomplished in order to provide an adequate research context within which to evaluate the significance of cultural resources and if necessary, define adequate mitigative measures.

Indeed, it is the responsibility of those charged with formulating cultural resources management specifications to require such analysis and to construct contract requirements in such a manner as to insure that data compatibility and continuity from project to project is adequate for such synthetic treatment. It is the responsibility of cultural resources contractors to adher to such specifications. Problems such as archeological xenophobia and territorialism aside, it is the failure of archeologists on one or both sides of CRM contracts to fulfill these requirements which is, for the most part, responsible for the largely artificial distinction between "pure" research and "contract archeology".

Under current law, the emphasis of cultural resources management is on

conservation rather than destructive data collection and funding for open ended research involving significant data bases is properly reserved for efforts to mitigate unavoidable adverse effects of construction activities. The parameters of CRM data collection consequently must be defined by the extent and nature of adverse construction effects.

Apart from the tendency to merge legal and archeological distinctions, this report has several other weaknesses. Report sections discussing the flora and fauna of the study area, which together occupy a little more than one page in this report, offer only the most general data on these important topics and certainly do not satisfy the contract requirement that "the quantity and quality of environmental data be sufficient to allow subsequent detailed analysis of the relationship between past cultural activitites and environmental variables." Chapter 4, on the other hand, concerning the history of the project area is detailed, well written and interesting.

The discussion of geomorphological and palynological investigations in Chapter 8 is presented with clarity and in-depth technical detail, although recommendations for deep archeological testing locations are limited to loci where cultural materials were found in previously dredged ditch material and to other known surface cultural deposits.

Section C-4.5 of the Scope of Work required the Contractor to "obtain sufficient field samples...to insure statistically reliable data" for two palynological columns. The section also states that "Obtaining suitable samples...shall be a prime consideration in the selection of sampling locations." The only constraints imposed on sampling locations were that soils "known to predate human occupation" not be examined and that sampling areas" be such as to yield data applicable to study areas." It is unfortunate that it was not possible, within these broad specifications, to obtain suitable palynological samples and associated radiocarbon dates as has been done in other regional projects.

In the reviewer's opinion, techniques used by SPEARS in obtaining controlled surface collections constitute an important weakness in project field methods. In many instances collections failed to cover 25 percent of site areas as stipulated in the Scope of Work. While it is certainly true that smaller sampling fractions were probably appropriate at some (or even most) sites, such reductions were required to be made only with the approval of the Contracting Officer. While the sample size and the type of controlled surface collection undertaken must be keyed to individual site characteristics and research goals, obtaining adequate samples of all classes of available surface data at each site must be a prime criterion where the future integrity of the data base is at issue.

Of greater concern in this instance, however, is the restricted spatial distribution of surface sample units. The transect samples used, while certainly cost effective, failed to supply adequate data on intrasite artifact variability and horizontal site structure including surface boundaries. The surface data gathered also failed to suggest the most propitious locations for subsurface testing.

Conclusions by Spears et al that Sites 3MS492, 3MS495, 3MS508 and 3MS509 are

not significant or eligible for the National Register represents a major report weakness. It appears to the reviewer that available data is clearly inadequate to make such determinations regarding these sites. The recommendations are particularly surprising in view of the strong concern for site preservation evidenced throughout much of the report.

The contract scope of work required a controlled surface collection and at least one 1x1 meter test unit at all sites unless it could be conclusively demonstrated that no significant cultural resources were present. In view of these requirements, SPEARS' pre-survey projection that 80 percent of discovered cultural loci would not require testing was clearly unrealistic. Had this estimate proved correct, the project would have had the lowest intensity of testing of any sizable intensive survey ever sponsored by the Memphis District.

Spears et al indicate that a number of sites in the study area were not, in fact, tested in accordance with contract provisions. A variety of reasons for the failure to test and evaluate these sites is given including lack of landowner permission to test, adverse environmental conditions and the fact that sites were located partially outside the study area. In several instances no reason is given. These sites will not be tested in the forseeable future by the District since it has been determined that all currently planned construction activities will occur well away from the sites. Indeed, given the extent of private sector site destruction in Northeast Arkansas, and the fact that cultural resources legal protection is primarily restricted to federal activities, it seems probable that some of these sites will never be tested.

It seems evident that SPEARS' miscalculation of the necessary level of site testing in the study area severely restricted budget flexibility in responding to unanticipated project obstacles such as the presence of crops and other vegetal cover, unsuitable soil conditions, etc. The authors, in fact, forthrightly reveal that "...these factors meant that the budget was stretched beyond it's limits."

Notwithstanding these problems, there is considerably more of archeological substance in this report than in most survey reports. The primary lithic analysis and the ceramic analysis are excellent as is the relatively brief discussion on regional research problem domains.

In the past, many conclusions concerning Woodland prehistory in the Central Valley have been more subjective than empirical in nature. This is not surprising given the lack of extensive data from in situ deposits and the ostensible homogeneity of most Woodland ceramics. .Although this problem has dogged archeologists in most of the eastern U.S. for years, generalizations about Woodland assemblages in this region have sometimes been stretched far beyond the logical reach of their meager empirical underpinnings.

It is becoming increasingly clear that more sophisticated ceramic analyses at the attribute level will be necessary in addressing Woodland problem domains. This is particularly true in Northeast Arkansas since Late Woodland "phases" (and even social units) have frequently been defined exclusively by ceramic tempering agents. It also seems likely that it will be necessary to operate at the non-stylistic attribute level in order to isolate Early and Middle Woodland ceramics from Late Woodland Baytown and Dunklin phase materials.

Spears et al notes that at in situ Big Lake midden deposits "fewer cardmarked sherds are found on the surface and more are collected with increasing depth in test units." Lafferty et al (1987) has reported the same relationship at deposits on the northwestern edge of Big Lake. This phenomenon is dramatic and can be shown by graphics and simple statistical tests to be highly significant. Whether these distributions reflect temporal differences in ceramic manufacturing techniques, or less likely, simply differential weathering as discussed by Spears et al in this report remains to be determined. In either case, implications for regionnl ceramic analysis are of great importance.

The relationship of the Early Mississippian Big Lake phase to the preceeding Woodland period is becoming a little less murky as available data gradually accumulates. Studies such as Rose, Marks and Tieszen (1986) and Lynott et al (1986) strongly suggest that maize, although available by the Late Woodland, was not intensively used until the Middle Mississippi period. The substantial temporal gaps between the first availability of maize, the adoption of radical shifts in ceramic technology (i.e. shell tempering), and the beginning of Intensive Agriculture point toward an evoluntionary rather than a revolutionary shift from a Woodland to a Mississippian milieu. Emerging data on Late Woodland site structure and settlement patterning (including data in this report) appear to support such a view.

It may well be, as Spears et al imply, that future investigations will require a redefinition of some of the area's most basic archeological hypotheses and classificatory units. Whatever the case, it is clear that the western edge of Big Lake offers a "test tube" environment for the study of these questions. This report has made a substantive contribution to the prehistoric knowledge of the region.

Douglas Prescott
District Archeologist

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