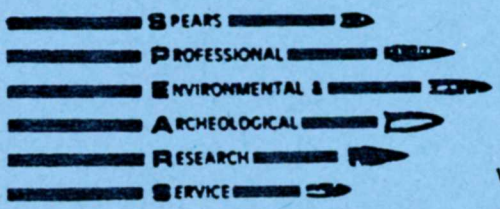
SIGNIFICANCE TESTING OF PREHISTORIC COMPONENTS AT THE EDGMON (3NW661), THE LUALLEN (3NW662), AND THE SATTLER SITES (3NW663) IN BOXLEY VALLEY, BUFFALO NATIONAL RIVER NEWTON COUNTY, ARKANSAS

Carol S. Spears
Robert A. Taylor
Margaret J. Guccione

FINAL REPORT

July 1989

Report prepared by



SPEARS
Rt. 1 Box 186
West Fork, AR 72774

for the

NATIONAL PARK SERVICE, Southwest Region
Purchase Order PX 7150-8-0112

SPEARS Report No. 89-6

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ABSTRACT

Spears Professional Environmental & Archeological Research Service (SPEARS) tested the Edgmon (3NW661), the Luallen (3NW662), and the Sattler (3NW663) Sites for their significance and eligibility for nomination to the National Register. The National Park Service intends to sell the tracts containing these sites to the public.

The Edgmon Site (3NW661) has low artifact densities and shallow disturbed deposits. It is not eligible for nomination to the National Register.

The Luallen Site (3NW662) contains a 40 cm thick Woodland and Mississippian midden, high densities of artifacts, and recognizable features. The Sattler Site (3NW663) has a 20 cm thick Middle Archaic stratum. Two storage/refuse pits, which originated in the intact stratum, were excavated and dated by radiocarbon methods. Geomorphic studies at the Luallen (3NW662) and Sattler (3NW663) Sites verified the origin and antiquity of the landforms.

The Luallen (3NW662) and the Sattler (3NW663) Sites are two of the best preserved open sites on record in the Ozark Mountain region and are eligible for nomination to the National Register. They should be considered as excellent locations for a long term program of archeological research. Until that time, these sites must be protected.

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Chapter 1

INTRODUCTION TO THE BOXLEY TESTING PROJECT

Carol S. Spears

The National Park Service intends to sell back into private ownership the Edgmon, Sattler, and Luallen tracts located in Boxley Valley of the Buffalo National River. Contained within these tracts are three previously recorded prehistoric archeological sites (3NW661, 3NW662, 3NW663). Under the purchase order awarded to Spears Professional Environmental & Archeological Research Service (SPEARS), the archeological sites were tested for their significance and eligibility for nomination to the National Register of Historic Places. The testing program as outlined in the Scope of Work (Appendix E) involved a combination of field methods including plowed transects, backhoe trenches, scrapes, controlled test units, and mapping at each site.

Boxley Valley is located on the upper portion of the Buffalo National River (Figure 1). In this vicinity, the valley is about seven miles long and one half mile wide.

Historical Components

Standing structures, which were excluded from this contract, lie at the edge of the three tracts investigated. The history of these buildings has been compiled by the National Park Service because they are part of the Big Buffalo Valley Historic District on the National Register of Historic Places. Informant interviews of the descendants of Boxley residents were conducted under contracts with the Center for Ozark Studies (1984). A general history of Boxley is described by Walter F. Lackey (1950) in The History of Newton County, Arkansas. A summary of this history is presented in a recent archeological report (Yakubik et al. 1988).

The name of the community and first Post Office, which was established in 1851, was called Whiteley, after Sam Whiteley who was one of the first setters in the area. In 1883, the post office was renamed Boxley after D. Boxley, a merchant and miller from Springfield, Missouri (Lackey 1950:176-193).

The Edgmon tract contains the Doy Edgmon place which consists of a 1960's house which was constructed on an older homesite. Outbuildings associated with the historic occupation

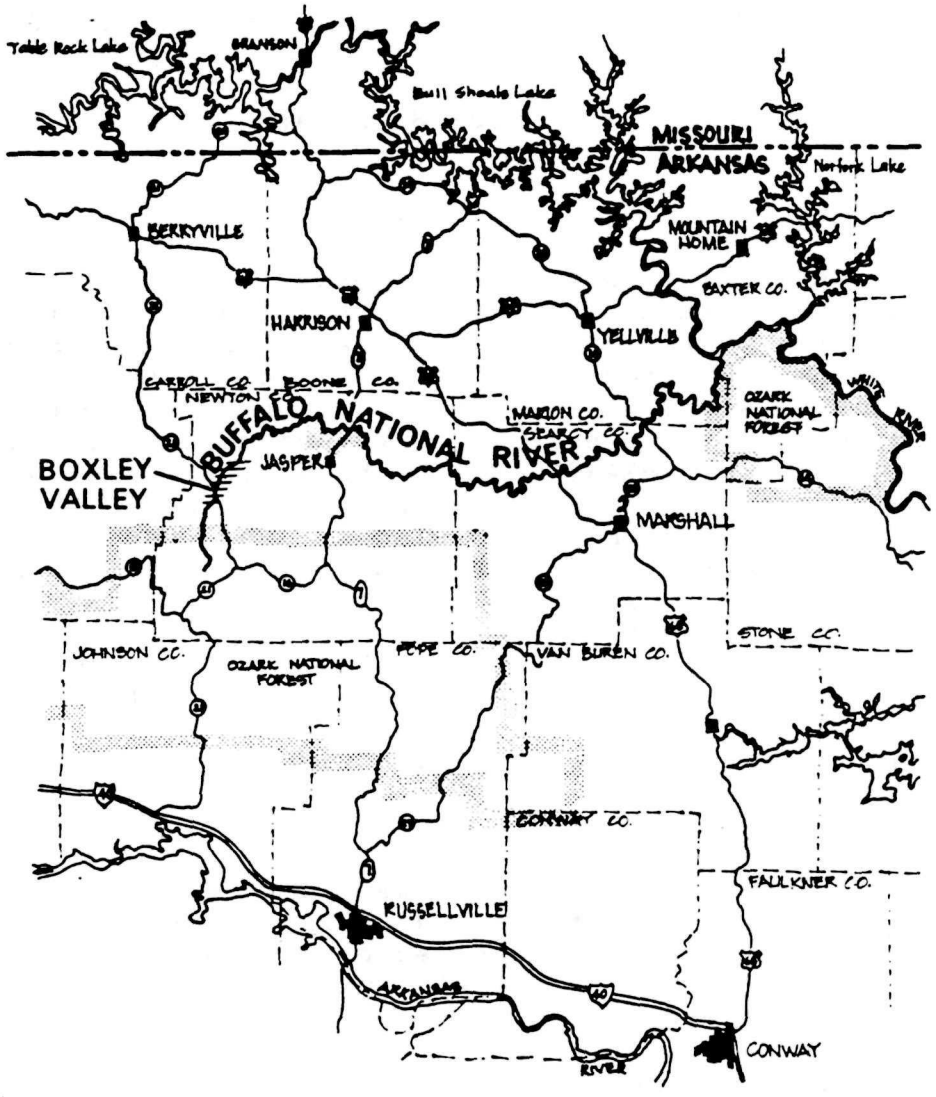


Figure 1. Location of Boxley Valley.

remain. Broxton Edgmon and his wife settled in Boxley around 1835 (Lackey 1950:51). Their original house was a log structure with three rooms, a porch on the front, and a chimney at one end (Center for Ozark Studies 1984). The location of the original house is not known. The Edgmon tract is owned by the federal government and the fields are managed under an agricultural use permit.

The Luallen tract contains a farm complex which includes a white frame house built by the Whiteleys. Sam Whiteley and his family settled in Boxley in 1835. As one of the first settlers in the area, they had first choice for land and location (Lackey 1950:50). Sam Whiteley's fields and pastures are shown on the 1845 General Land Office Survey map. Today, buildings surrounding the house include the remains of a store, an old cellar, barns, and other outbuildings. During the long history of Boxley, this historic site has been a focal point for the community and scattered farmsteads throughout the region. The structures have housed Boxley's telephone exchange, post office, and store. The fields are managed under an agricultural use permit. Since there is unlimited access by the public on both the Edgmon and Luallen tracts, the buildings have been vandalized.

The Sattler tract is north of Walnut Grove Church, the old Community building, the parsonage, and the cemetery. The Community building is a two story frame structure which was built in the 1870s. The church was built in 1951 and the parsonage in 1959 (NPS 1985). The cemetery contains the graves and monuments of the early settlers and their descendants. These structures and the adjacent lots are privately owned.

Project Schedule and Constraints

Fieldwork for the project involved 25 field days (with 2 to 5 persons) between April 19 and June 16, 1988. Due to the lack of precipitation subsequent to plowing the transects on two sites, the fieldwork was temporarily delayed until it rained. After this initial setback, the project proceeded with few additional constraints. Toward the end of the fieldwork, hard, dry, compact sediments were encountered within test excavations at 3NW662. Alternating 10 cm levels were water soaked overnight to facilitate their excavation.

Testing Results at the Edgmon Site (3NW661)

Results of the fieldwork at 3NW661 disclosed cultural deposits which were shallow and confined to an upper disturbed plowzone. Artifact densities across the site were extremely low. Only two temporally diagnostic artifacts were found, one arrowpoint preform which is associated with the Mississippi period and one hand painted polychrome sherd which is probably associated with the historic farm complex located east and outside of the project boundary. The area investigated was utilized in a very limited fashion both prehistorically and historically. Due to

the poor integrity of this site and its low research potential, 3NW661 is not significant or eligible for nomination to the National Register of Historic Places.

Testing Results at the Luallen Site (3NW662)

Prehistoric site 3NW662 extends over the entire 60 acre Luallen tract and beyond. The plowed transects contained several areas with high artifact densities and numerous diagnostic arrowpoints, projectile points, and ceramics. The majority of these artifacts date to the Mississippi and Woodland periods. Subsurface tests verified deep intact cultural middens which extended below the plowzone and were approximately 40 cm thick. Artifact densities in the middens were high with 10 cm levels in a 1 m x 1 m unit containing up to 955 artifacts. Cultural material included animal bone (burned and unburned), carbonized nutshells and wood, shell tempered and clay tempered ceramics, arrowpoints and projectile points (mostly contracting stem and corner notched varieties) and lithic debitage. Features such as pits and postmolds were identified. Deeply buried cultural strata extending over one meter in depth were evident in the excavation units and river bank. The Luallen Site contains a wealth of information relative to our understanding of the prehistory of the region during the Woodland and Mississippi periods. Research topics which could be addressed at this site include, but are not limited to: subsistence, diet, climate, house structure, site patterning, lithic and ceramic technologies, chronological refinements, etc. In SPEARS opinion, 3NW662 is highly significant and eligible for nomination to the National Register.

Testing Results at the Sattler Site (3NW663)

Site 3NW663 covers three topographic features: the flood plain, a prominent first terrace, and a second terrace of Moore Creek. Prehistoric utilization of the flood plain was limited. The terrace toward the east edge of the tract was occupied/utilized more extensively. In this vicinity, an intact cultural stratum dating to the Middle Archaic was found to extend about 20 cm below the upper disturbed plowzone. Two large pits, measuring about one meter in diameter and about 50 cm in depth, originated within the undisturbed cultural stratum. Fill included carbonized hickory nut shells and numerous lithic artifacts. Radiocarbon dates of 4420-4925 B.C. (Beta-26213, corrected) and 4740-5240 B.C. (Beta-216214, corrected) were obtained from each pit. The pits were separated by two large grinding stones. The prehistoric storage/refuse pits and nut processing activity area represent the first Middle Archaic features documented within an open site in the region. Since the research potential and integrity of the deposits are excellent, portions of 3NW663 are significant and eligible for nomination to the National Register.

Recommendations

Recommendations for the management of the significant cultural resources at 3NW662 and 3NW663 involve a program of protective measures and future interpretive investigations. According to the State Plan (Davis ed. 1982), information contained in significant sites is sometimes best protected through scientific excavation, study, and proper curation. Since excavation may not be feasible at this time, 3NW662 and 3NW663 require immediate stabilization and active protection from natural and other destructive activities such as relic collecting. Any proposed projects with ground disturbing activities must be properly mitigated.

Covenants and perpetual easements on sellbacks which emphasize site protection measures and allow for continued scientific research may be acceptable alternatives for the long term management of these important sites. These types of agreements and their ramifications must be carefully scrutinized before they are adopted and used as the mechanism to protect our nation's most valuable cultural resources.

Chapter 2

LATE QUATERNARY HISTORY OF THE BUFFALO RIVER, BOXLEY, ARKANSAS

Margaret J. Guccione

STUDY AREA

The study area is located near the southern margin of the North American craton. A thin succession of shallow water Paleozoic carbonate, shale, and sandstone, cover Precambrian igneous and metamorphic rocks. Deformation of these strata is slight. The rocks dip at low angles to the southwest away from the Ozark Dome in southeastern Missouri. A few normal faults, which formed as the Arkoma foreland basin developed to the south, are generally oriented east-west.

On the basis of physiography the study area is located in the Ozark Plateaus Province (Figure 2) (Thornbury 1967). This province includes an east-central domal uplift, the St. Francis Mountains in southeast Missouri, and three plateaus, all of which dip gently away from the dome. The Salem Plateau is underlain by Ordovician carbonate strata, the Springfield Plateau is underlain by Mississippian carbonate strata, and the Boston Mountain Plateau is underlain by Pennsylvanian sandstone and shale strata. These plateaus are separated by escarpments which face toward the St. Francis Mountains. The Eureka Springs Escarpment rises from the Salem Plateau to the Springfield Plateau and the Boston Mountain Escarpment rises from the Springfield Plateau to the Boston Mountain Plateau.

The Buffalo River deeply dissects all three plateau surfaces and its channel is cutting into Ordovician strata throughout most of its course. The headwaters flow north across the Boston Mountain Plateau (Figure 3). At the Boston Mountain Escarpment, the river makes a right angle bend and flows generally east across the Springfield and Salem plateaus to its confluence with the White River on the Salem Plateau. The study area is along a north-flowing stretch of the river at the Boston Mountain Escarpment between the Boston Mountain Plateau and the Springfield Plateau. Here the channel is cutting into the Mississippian age Boone Limestone (Haley et al. 1976).

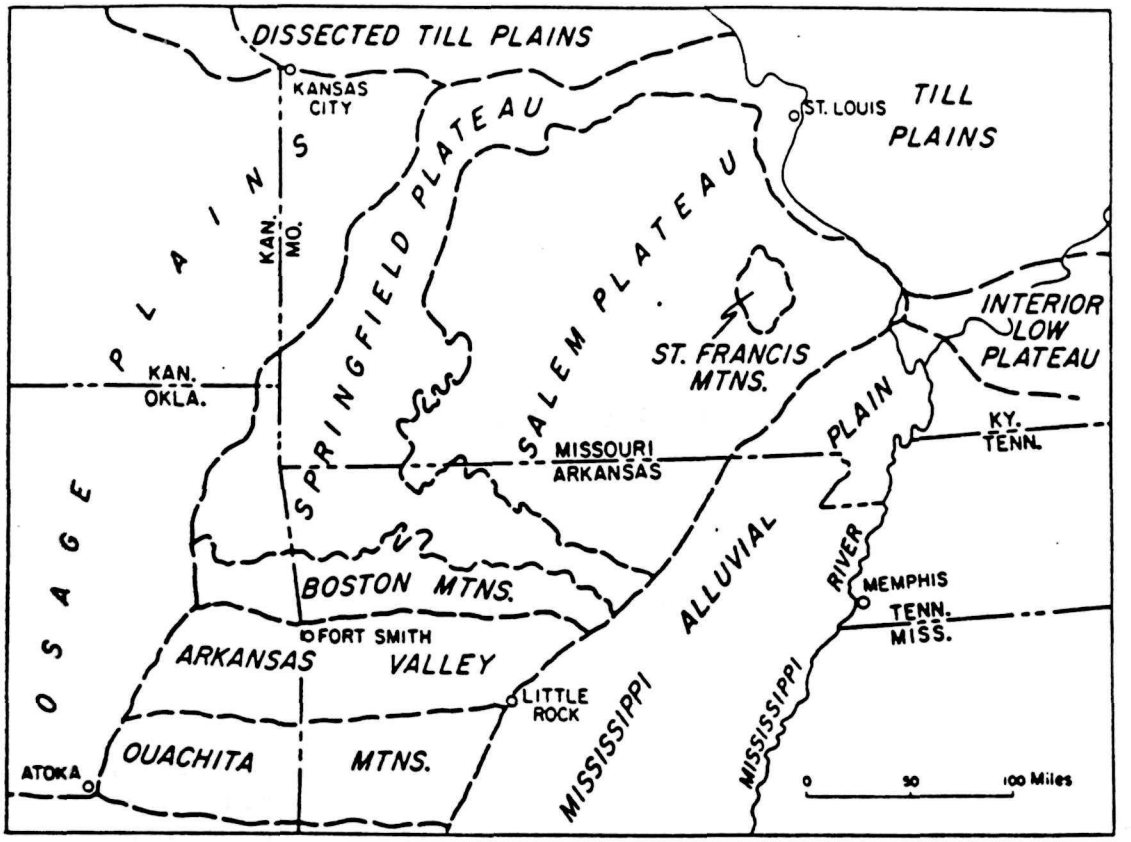


Figure 2. Physiographic Provinces of the South Central United States.

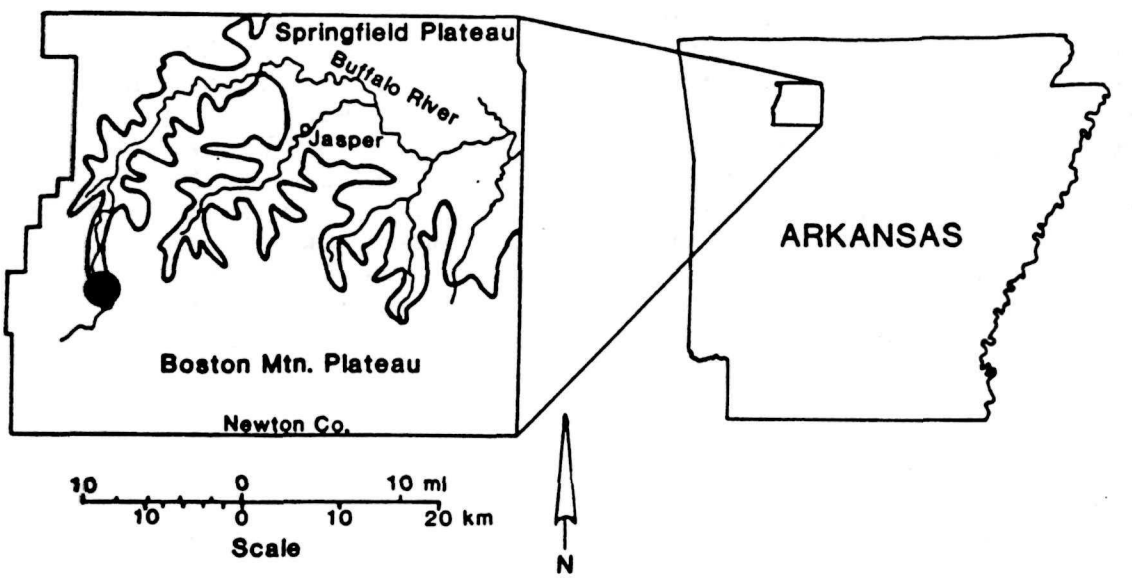


Figure 3. Location of the Study Area.

METHODS

Several short trenches were dug approximately perpendicular to the trend of the valley. These were briefly examined and some were described and sampled in detail (Figures 4 and 5). At the Sattler Site, three trenches were studied; one was located on the flood plain of Moore Creek near its confluence with the Buffalo River, the second on a low terrace, and the third was located on a high terrace. At the Luallen Site, all the trenches were located on the flood plain of the Buffalo River in a transect from near the east valley wall to the present channel which is located along the west valley wall. The trenches were up to 2.8 m deep. Soils were described at these sites using standard USDA format (Soil Survey Staff 1981). Thirty-nine samples were analyzed for grain size by dry sieving the gravel and the sand fractions and by pipette methods for the silt and clay fractions (Table 1) (Day 1965). Gravel is reported as a percent of the total sample. Sand is reported as a percent of the 0.002-2 mm fraction to eliminate the effect of pedogenesis as well as a percent of the <2 mm fraction to assess the effect of pedogenesis.

Dates were estimated using archeological material. Organic archeological materials were submitted to Beta Analytic for radiocarbon analysis.

Table 1. Size Fractions Used in this Study.

FRACTION	DIAMETER
Gravel	>2.0
Sand	
very coarse	2.0 - 1.0
coarse	1.0 - 0.5
medium	0.5 - 0.25
fine	0.25 - 0.125
very fine	0.125 - 0.0625
Silt	
coarse	0.0625- 0.016
medium	0.016 - 0.004
fine	0.004 - 0.002
Clay	<0.002

GEOMORPHOLOGY

The Buffalo River is a straight river, deeply entrenched in bedrock. Local relief along the river is up to 408 m (1,340 ft)

in the Boston Mountain Plateau subprovince and up to 195 m (640 ft) in the Springfield Plateau Province. The valley floor is no more than 670 m (2,200 feet) wide at this indention of the Boston Mountain Escarpment and no terraces are preserved in the study area. However, terraces are preserved along tributaries, such as Moore Creek at its confluence with the Buffalo River. Further downstream near Erbie, Arkansas, at the major front of the Boston Mountain Escarpment, the valley is even narrower (300 m or 990 ft). Here a paired terrace, 3.5 to 4 m (10 to 13 ft) above the flood plain occurs at some locations (Guccione 1988). Even further downstream, where the river is dissecting the Springfield Plateau, near Rush, Arkansas, two terraces occur along the Buffalo River at the confluence of Rush and Clabber Creeks (Dixon 1986). Colluvial fans extend from the valley wall onto the flood plain or terraces at many locations along the valley.

In most of this section of the Buffalo River there is a single, bedrock-floored channel. At the study site, however, the major bedrock-floored channel occurs at one edge of two enechelon gravel bars. During low water stages the water is confined to the bedrock-floored channel but, during high water stages, water flows in both the gravel-floored chute channels and in the deeper bedrock floored channel. This type of channel configuration occurs along straight sections of the stream between meander bends.

THE LUALLEN SITE (3NW662)

Floodplain Sediments

Overbank and channel sediments beneath the flood plain of the Buffalo River were exposed at the Luallen Site (3NW662). A series of seven trenches, dug in a transect perpendicular to the river, exposed the upper 1 to 3 meters of sediment. Five of these trenches were examined in more detail (Appendix F) and were sampled. These exposures were dominated by sand and gravel deposited in the main channel and in a chute channel. Loam overbank deposits are also present on the east side of the valley.

The oldest sediment exposed in the trenches is present on the east side of the valley (Figure 4). There are two units present. The lower unit is gravel which is grain-supported and contains coarse to fine sand, silt, and clay in the interstices (Table 2). The sand fraction is bimodal with a primary mode of very coarse sand and a secondary mode of medium sand. This unit is interpreted as a channel bar deposit. Overlying the gravel bar and associated with it is a thin (40 cm) sand unit. This deposit has a unimodal sorting in the sand and silt fractions. Both the sand and the underlying gravel have a significant clay fraction that has mechanically infiltrated into the pore spaces.

Above the gravel and sand is a younger overbank deposit (Figure 4). This sediment has little or no gravel and is bimodal

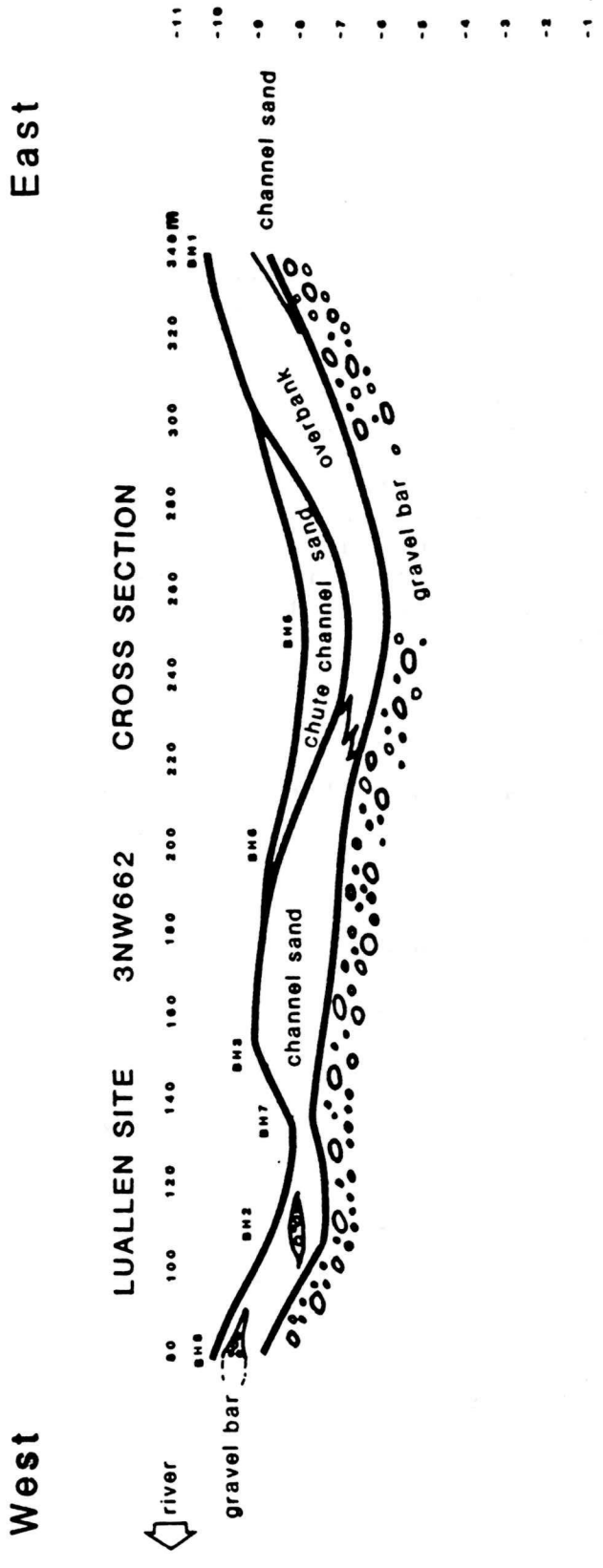


Figure 4. Cross Section of the Buffalo River Floodplain at the Luallen Site, 3NW662.

with modes in the fine sand and silt fractions (Table 2). It becomes finer grained with increasing distance from the channel source. The unit has a constant thickness of 93 cm in the eastern part of the valley.

Toward the channel, the overbank sediment grades into unimodal sand and gravel lenses (Figure 4). These are the channel facies and they are similar to the older channel gravel beneath the overbank deposit. Both gravel units are grain-supported with medium to fine sand, silt, and clay in the interstices (Table 2). The major difference between the two gravel units is the amount of interstitial clay. The older gravel has 20% clay in the less than 2 mm fraction and the younger gravel only has 6% clay.

The youngest sediment in this series of trenches is the chute channel sand that is present within a paleochannel on the east side of the valley (Figure 4). This is a unimodal fine-grained sand (Table 2). Historic records report that a flood event, of the type responsible for the deposition of this unit, occurred in the 1940's.

Table 2. Size Analysis at the Luallen Site, 3NW662.

TRENCH 1

#	DEPTH	HORI-ZON	TOTAL SAND	SILT	CLAY	GRAVEL	SAND VC	C	M	F	VF	SILT C	M	F	CLAY	%*
Chute channel sand																
14	12	Ap	60	34	6	0	0	1	13	31	15	17	12	5	6	64
15	28	B1t	42	42	16	0	0	1	9	21	12	19	16	7	16	51
17	49	B1t	42	38	20	0	0	1	8	20	12	18	14	6	20	52
Overbank																
18	70	B2t	44	34	22	1	0	1	10	21	12	16	13	5	22	56
19	92	B2t	42	33	26	1	1	2	11	18	10	15	12	6	26	56
Channel sand																
20	119	2C	53	23	24	1	2	5	18	20	9	9	10	4	24	70
Channel gravel																
21	157	2C	63	16	20	40	18	12	16	12	5	6	6	4	20	80

TRENCH 5

#	DEPTH	HORI-ZON	TOTAL SAND	SILT	CLAY	GRAVEL	SAND VC	C	M	F	VF	SILT C	M	F	CLAY	%*
Chute channel sand																
27	18	Ap	61	29	9	1	1	2	17	30	11	10	14	5	9	68
28	41	C	62	29	8	0	0	1	14	32	14	13	12	4	8	68
29	74	C	61	31	8	0	0	1	9	31	20	16	11	4	8	66
30	100	C	48	39	12	0	0	0	3	22	23	19	14	6	12	55
Overbank?																
31	125	C	54	33	14	0	1	1	10	26	16	16	13	4	14	71
32	147	2C	54	22	23	7	2	3	19	22	8	8	10	4	23	71
33	173	3C	66	15	18	0	0	1	28	29	8	5	7	3	18	81

TRENCH 6

#	DEPTH	HORI-ZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	TOTAL GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY	%*
Chute channel sand																
34	14	Ap	84	13	2	0	0	2	32	41	10	6	5	2	2	87
35	31	C	79	17	5	0	0	1	27	39	11	7	7	3	5	82
Channel sand																
36	48	C	66	27	7	1	2	3	19	28	14	13	10	4	7	71
37	70	C	52	36	12	0	0	1	12	23	15	16	15	5	12	59
38	94	C	54	31	14	1	0	1	16	24	12	14	12	5	14	63
39	121	C	66	20	13	0	0	2	23	29	11	9	8	3	13	76

TRENCH 7

#	DEPTH	HORI-ZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	TOTAL GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY	%*
Channel sand																
22	18	A	67	25	7	2	2	4	25	26	10	10	10	5	7	73
23	38	Bw	70	22	10	2	2	3	27	28	10	9	9	4	10	76
Channel gravel																
24	63	2C	76	18	6	23	5	7	33	24	6	4	11	3	6	81

TRENCH 8

#	DEPTH	HORI-ZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	TOTAL GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY	%*
Channel sand																
25	18	Ap	75	20	5	14	3	4	26	30	12	10	7	3	5	79
26	116	C	93	6	1	17	13	19	42	17	3	2	2	2	1	94

* Ratio of sand divided by sand + silt

Soils

Alfisols and entisols occur on the flood plain of the Buffalo River (Fowlkes et al. 1988). The Razort soil series is formed on the flood plain along the east valley wall. This alfisol is developed in the loamy overbank alluvium where it is not overlain by the chute channel sand (Appendix F). It has an argillic horizon, a hue of 10YR, low value and chroma, and a solum that is greater than 100 cm thick. Along the west valley wall, the Ceda soil series has developed in sandy channel sediments (Appendix F). This poorly developed entisol does not have an argillic horizon.

Geomorphology

A paleochannel is present along the east side of the valley. This paleochannel is defined by a depression in the older sand and gravel unit and is located at Backhoe Trench 5 (Figure 4). The gravel rises in elevation on either side of the paleochannel and it grades to higher and coarser-grained proximal overbank sediment to the west. The last phase of this paleochannel fill is a chute channel sand. This unit is restricted to the paleochannel and pinches out on either side of it.

Between the paleochannel and the present channel is an area slightly higher in elevation with some subdued swells and swales (Figure 4). This morphology seems to be the result of a series of point bars (ridges) and intervening swales but does not mark any major paleochannel position.

Chronology

The entire flood plain in this area of the Buffalo River is middle to late Holocene. The oldest gravel bar and the associated paleochannel on the east side of the valley is greater than 1,800 years old (age of the oldest stratified diagnostic artifacts). If the lowest stratified artifacts are Archaic, the paleochannel may have existed more than 4,000 years ago. This channel was abandoned more than 1,800 years ago and perhaps more than 4,000 years ago. Subsequently, it has occupied positions to the west. The intermediate channel was probably not very distant west of the paleochannel and was east of its present position. It may have been a relatively wide and shallow channel resulting in a broad series of gravel and sand bars. Relatively coarse overbank sediments partially filled the adjacent paleochannel. The formation of this intermediate channel began at least 1,800 years ago, the maximum age of diagnostic cultural material within the overbank deposit. The present channel position is probably younger than 500 to 1,100 years. This is the age of the youngest cultural material within the overbank deposit and of archeological features with gravel bars adjacent to the modern channel. Utilization of the paleochannel as a chute channel with concentrated flow during a flood event is very recent.

THE SATTLER SITE (3NW663)

Sediments

The Sattler Site (3NW663) is located at the confluence of Moore Creek and the Buffalo River. The site includes a terrace (t-1) and a flood plain of Moore Creek, separated by a 3 m high scarp (Figure 5). Scarp height decreases upstream as the terrace and the flood plain merge to form a single surface. The terrace has two levels with a difference in elevation of 2 m and a long gentle slope separating them. Three trenches, 1 to 1.3 m deep, were described and sampled; the first (Trench 2) was in the higher portion of the terrace (t-1b), the second (Trench 1) was in the lower portion of the terrace (t-1a), and the third (Trench 5) was in the flood plain. Each trench exposed a gravel channel deposit and an overlying loam overbank deposit.

The oldest sediment exposed in these trenches is the channel gravel that underlies the terrace. Though it is older beneath the higher t-1b than it is beneath the lower t-1a, the chronological difference is probably slight. At both locations the gravel is subangular to subrounded and grain-supported with very coarse sand to clay in the interstices (Table 3). The gravel fraction

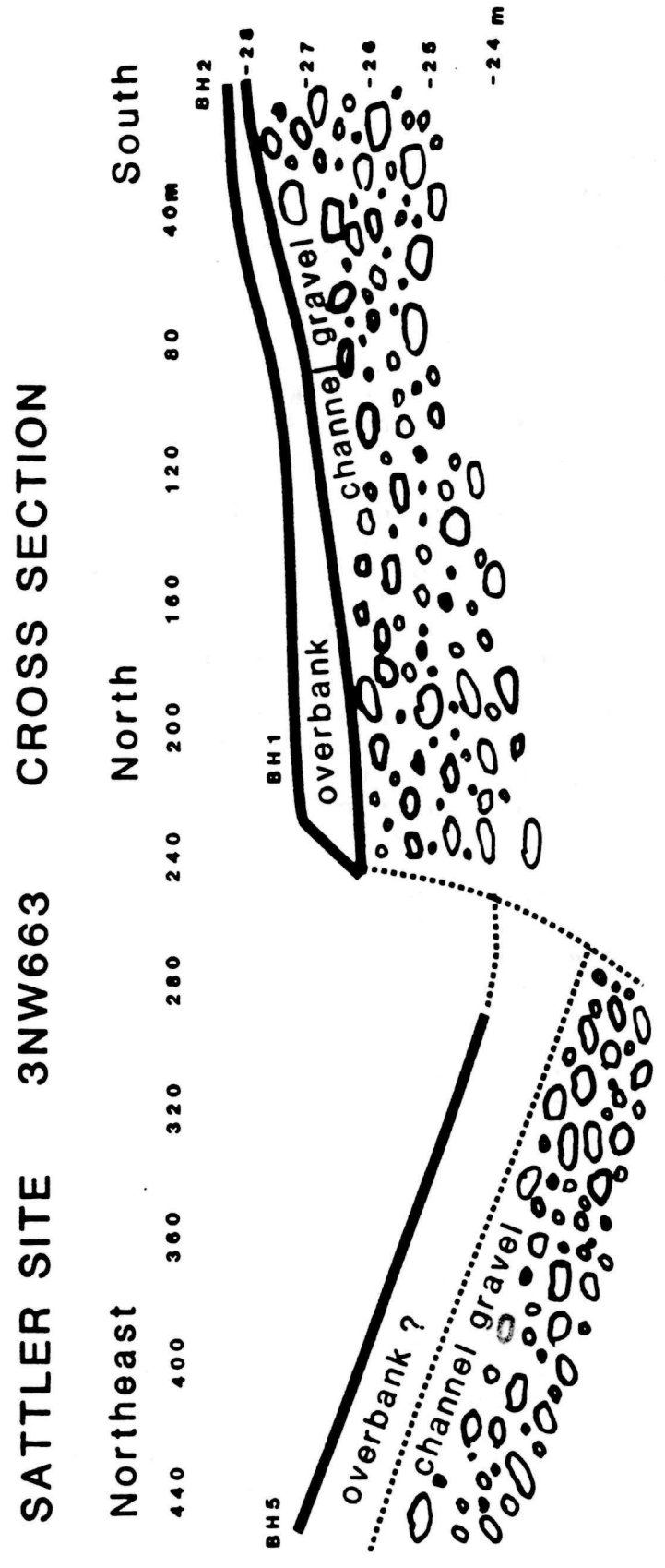


Figure 5. Cross Section of the Terraces at the Sattler Site, 3NW663.

is coarser grained beneath the higher terrace than it is beneath the lower terrace.

Above the gravel is a younger overbank deposit. The unit is relatively thin. The maximum thickness observed is 90 cm at Trench 1, but 20-50 cm is more common. At both locations this sediment contains appreciable gravel which is not grain-supported. Similar to the underlying gravel, the overbank sediment is coarser with more abundant gravel (granules) beneath the high terrace than beneath the lower terrace (Table 3). The sand and the silt fractions are bimodal at both locations.

Younger deposits occur under the flood plain of Moore Creek than are present under t-1. A grain-supported channel gravel is exposed at the base of Trench 5. Similar to the channel gravel beneath the terrace, it is grain-supported and contains sand, silt, and clay in the interstices, but the very coarse sand is not as abundant as that of the terrace gravel (Table 3).

Overlying the channel gravel is a younger loam deposit. This stratum thins laterally over bars of gravel, but in general is thicker (0.5-1.4 m) than the overbank sediment present that forms the terrace surface. Unlike the upper loam sediment that occurs below the terrace surface, that below the flood plain contains very little gravel in the lower portion, no gravel in the upper 75 cm of the 1.4 m thick unit, and has a unimodal distribution of the sand and silt fractions (Table 3). The unimodal grain size distribution and the relatively low elevation of the gravel surface suggests that the unit may be a chute channel fill or a swale between gravel bars. Alternately, the unit may be an overbank deposit, but overbank deposits are typically bimodal (see discussion of overbank sediment beneath the terrace surface at the Sattler Site and below the flood plain surface at the Luallen Site).

Soils

The Spadra soil series is formed on the terrace of Moore Creek (Fowlkes et al. 1988). This ultisol is developed in alluvium with some gravel, has an argillic horizon, a hue of 7.5YR, and a solum that is greater than 100 cm thick. Though the flood plain of Moore Creek is mapped as Razort series (Fowlkes et al.1988), the flood plain solum examined in this study is also an example of the Spadra soil series (Appendix F). The similarity of the sola at each site suggests that all have developed during approximately the same interval of time and that the flood plain and terrace of the tributary are not presently accreting appreciable sediment.

Geomorphology

The gravel beneath the terrace at the Sattler Site was deposited by Moore Creek as a channel deposit. This unit is a broad sheet of gravel which gently slopes toward the northeast and is approximately parallel to the terrace surface. The over-

lying flood plain sediment may have been derived from the Buffalo River to the east, Moore Creek to the north, or both. A Buffalo River source is considered to be more likely for the following reason. The sediment at both sites is relatively coarse-grained with significant amounts of gravel and high percentages (52% at the high terrace and 63% at the low terrace) of sand in the sand plus silt fractions (Table 3). Both study sites on the terrace are close (40-50 m) to the terrace margin adjacent to the Buffalo River, but only Trench 1 is close (20 m) to the terrace margin adjacent to Moore Creek. The second site, Trench 2, is 190 m from Moore Creek. If Moore Creek was the major source of the overbank deposit, the sediment would be much finer grained at Trench 2 than it is at Trench 1.

Downcutting of the Buffalo River to the east and Moore Creek to the north modified the flood plain into a terrace. New and lower flood plains were formed by these streams. Initially the Buffalo River was along the west side of its valley and Moore Creek was in the center of its valley. Since that time, the rivers have migrated to their present positions along the east and north edges of their valleys respectively. Moore Creek deposited a channel gravel across the northern half of its valley as it migrated to its present position. Overbank or chute channel loam deposits overlie the gravel bars.

Table 3. Size Analysis at the Sattler Site, 3NW663.

TRENCH 2

#	DEPTH	HORI-ZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	TOTAL GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY	%*
9	9	Ap	54	43	3	30	4	5	17	18	9	22	17	4	3	55
10	24	AB	45	45	10	34	3	4	16	16	7	19	19	7	10	51
11	47	Bt1	44	41	15	42	8	4	13	13	5	16	20	5	15	51
13	95	Bt2	51	30	19	61	18	7	11	10	4	11	14	5	19	63

TRENCH 1

#	DEPTH	HORI-ZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	TOTAL GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY	%*
1	20	Ap	63	34	3	17	2	5	22	24	10	18	12	4	3	65
3	45	Bw	53	36	11	10	2	4	19	20	8	16	16	4	11	60
5	69	B2w	53	34	12	2	2	5	20	20	7	14	15	5	12	61
7	99	2C?	57	31	12	11	4	5	20	21	7	13	13	5	12	65
9	131	2Bbt	69	15	15	52	18	11	21	15	5	4	9	2	15	82

TRENCH 5

#	DEPTH	HORI-ZON	TOTAL SAND	TOTAL SILT	TOTAL CLAY	TOTAL GRAVEL	SAND VC	SAND C	SAND M	SAND F	SAND VF	SILT C	SILT M	SILT F	CLAY	%*
1	17	Bt1	68	28	4	0	1	3	24	27	14	14	11	3	4	71
2	32	Bt1	61	29	10	0	1	2	17	27	14	14	11	4	10	67
4	69	Bt2	54	28	17	4	1	2	14	24	14	13	10	5	17	66
6	99	Bt2	51	26	22	1	1	2	13	23	13	12	10	4	22	67
8	125	2C	65	15	20	14	5	7	25	21	7	5	7	3	20	78

* Ratio of sand divided by sand + silt

Chronology

The terrace and the flood plain of Moore Creek are Holocene in age. The terrace was an active flood plain accreting overbank deposits during the Middle Archaic cultural period. Two intact and intrusive cultural features extend from 35 cm depth into the underlying gravel in Trench 1. Corrected radiocarbon dates from these features are 4,420 to 4,925 B.C. (5,750 ± 90 BP, Beta-26213) and 4,740 to 5,240 B.C. (6,010 ± 70 years BP, Beta-26214) indicating that this was an active flood plain during the middle Holocene. The extremely slow sedimentation rate of the upper 35 cm (0.00085 cm/year), the occurrence of thick ultisols with 7.5YR colors and an argillic B horizons, and the lack of stratified Woodland and Mississippian cultural materials suggest that the surface has not received active sedimentation for some time. In fact, the relatively high concentration of surface artifacts suggests that there may have been some deflation of this surface.

SUMMARY

The Luallen and the Sattler Sites are different in their sediments and their ages. The older Sattler Site is along Moore Creek, a small tributary to the Buffalo River. During the middle Holocene the creek deposited a channel gravel unit. This unit is overlain by thin overbank sediments deposited by the Buffalo River when the Buffalo River was adjacent to the site and its flood plain was approximately 3 m higher than at the present time. After downcutting of the Buffalo River and migration of the channel to the east, away from the site, the flood plain became a terrace. This terrace received little or no sedimentation from Moore Creek or the Buffalo River during the late Holocene and ultisols developed at this site.

A depositional sequence similar to the terrace occurs beneath the flood plain surface of Moore Creek. After the downcutting of the Buffalo River, the creek also had to erode to maintain grade with the Buffalo River. Initially the stream

maintained a relatively high gradient and transported gravel in its channel. As the Buffalo River migrated to the east, away from its confluence with Moore Creek, the gradient of Moore Creek decreased and it began to accrete. This accretion is slow or has ceased, allowing weathering to keep pace with sedimentation and develop an ultisol with easily recognizable soil horizons.

Middle Archaic occupation during the middle Holocene was the last major occupation of this site prior to historic time. Approximately 6,000 years ago the Buffalo River was on the west side of its valley and adjacent to the site. Subsequently the river has migrated toward the east side of its valley and away from this site. Presumably, the increasing distance to the Buffalo River made this site less optimum for human habitation during the late Holocene.

In contrast to the middle Holocene tributary stream sediments at the Sattler Site, the Buffalo River sediments at the Luallen Site are middle to late Holocene. Downcutting dominates in the Buffalo River. The valley is narrow and the channel rapidly migrates back and forth across it. Evidence at the Luallen and Sattler sites suggests that migration of the 670 m (2,200 feet) between valley walls along this section of the Buffalo River takes between 1,800 and 6,000 years. Consequently the sediments within the Buffalo River valley are younger than those in some of the wider tributary valleys, which are not scoured out as frequently. The soils developed on the flood plain are entisols and alfisols.

During the late Holocene, the Buffalo River cut a channel on the east side of its valley at the Luallen Site. It moved toward the middle of the valley by 1,800 years BP and deposited gravel in its active channel at that time and overbank sediment in its abandoned channel. The present channel has formed along the west side of the valley in the past 500 to 1,000 years. Recently, this segment of the Buffalo River may have reduced its gradient by aggradation or by increasing its sinuosity, allowing the higher-gradient abandoned channel on the east side of the valley to act as a chute channel (Saucier 1984). During a recent flood event the paleochannel was the site of concentrated water flow and channel sand deposition instead of overbank loam deposition, as it had been occurring earlier. The Buffalo River may be in its initial stages of abandoning its present channel and reoccupying its paleochannel.

Archaic to historic peoples have occupied the main Buffalo River Valley. Archaic occupation along the valley occurred at the Sattler Site near Boxley, the Elk Track Site near Erbie, and the Clabber Creek, the George Williams, and the Dirst Recreation Area Sites near Rush. No diagnostic Archaic artifacts were found in situ at the Luallen Site, but flakes beneath Mississippi and Woodland middens are interpreted as probable Archaic artifacts. In situ pre-Archaic cultural material has not been reported along the Buffalo River. The river migrates across the relatively narrow valley in less than 6,000 years. This rapid migration has

probably removed evidence of pre-Archaic cultures along the narrow reaches of the Buffalo River.

Chapter 3

ENVIRONMENTAL BACKGROUND, PREVIOUS RESEARCH AND CULTURAL PREHISTORY

Robert A. Taylor

INTRODUCTION

In the National Park Service's introduction to the land use plan and cultural landscape report for Boxley Valley, the valley has been described as a well preserved example of recent cultural evolution:

> Historically the valley has been a series of small family-operated farms, whose occupants have continually had to adapt to an everchanging agricultural economy while constantly contending with the forces of nature, especially flooding from the river [NPS 1985:1].

Continual adaptation to various economies, including agriculture, has been characteristic of Boxley Valley throughout its human prehistory as well. Guccione (Chapter 2) has discussed the dynamic nature of the river and the physical character of the flood plain. Undoubtedly, environmental factors have contributed to several viable economies and technologies as well as stimuli for economic and social innovation.

The following discussion will present (1) a brief introduction to the natural resources in the Boxley Valley, (2) a review of previous archeological investigations, and (3) a summary of the postulated sequence of prehistoric change in the valley. This discussion is meant to be neither critical nor exhaustive, but is intended to provide a context for the analyses and interpretations presented later in this report.

NATURAL RESOURCES OF BOXLEY VALLEY

The Buffalo River itself is the most notable natural resource in Boxley Valley. It is the source of not only water but also stone for making tools, fertile soils for cultivation, and numerous edible species of animals and plants.

Much of the water in the river is provided by a mean annual precipitation of 57 inches per year in the headwaters region (Lackey 1950:14). This amount of precipitation is significantly

greater than the rainfall in either the Arkansas River Valley to the south or on the plateaus to the north (Figure 6). The Buffalo River also arises in the coolest region in the state (Figure 7), a factor which probably contributes to the available moisture.

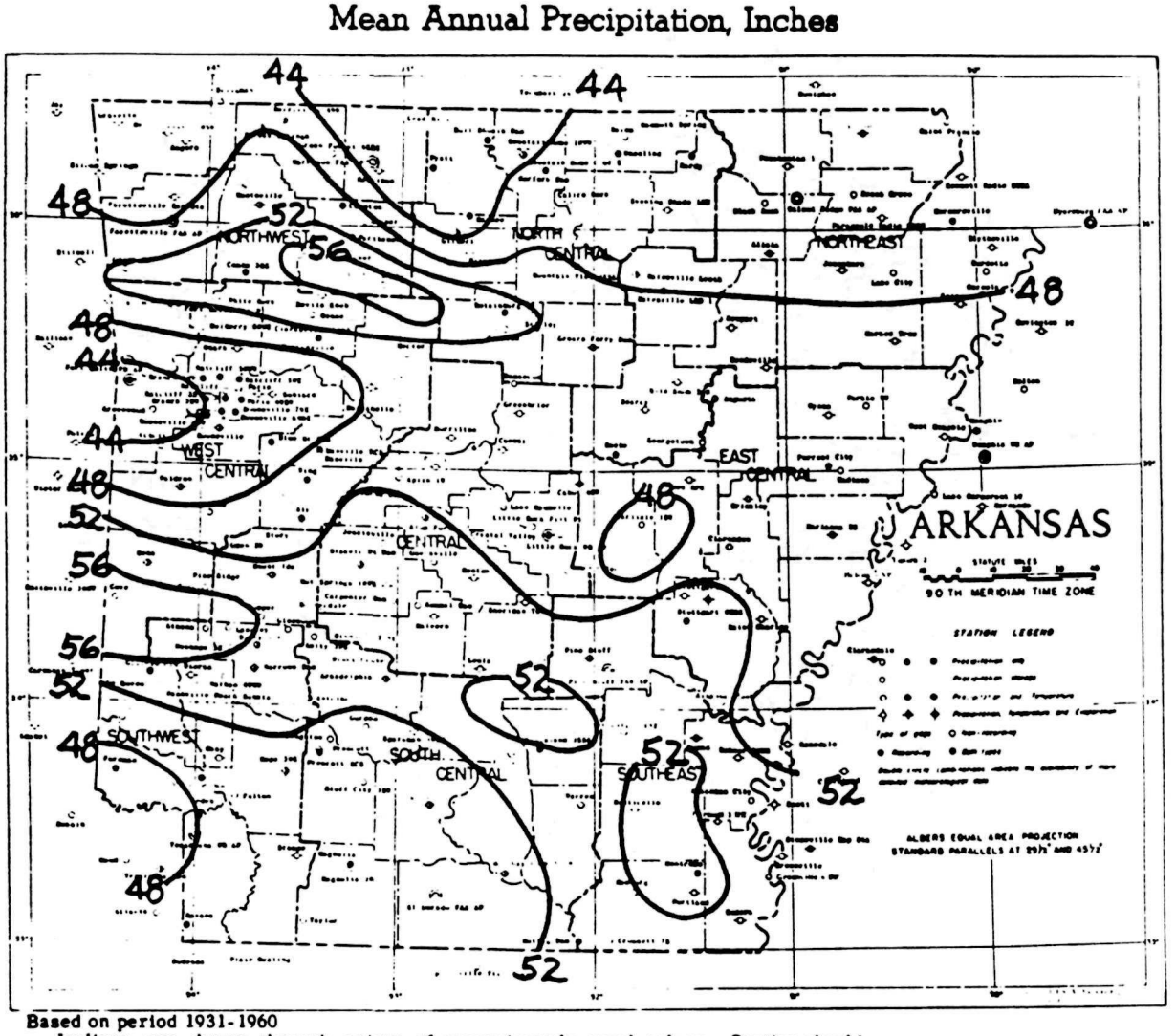
Although runoff is rapid over the resistant sandstones of the Boston Mountains, limestones at lower elevations collect and conduct a significant amount of water which emerges in numerous springs. These springs are common in Boxley Valley, with one or more being located at or very near all three of the archeological sites being described in the present report. The historic significance of the springs is evident by their relationship to old homesteads in the valley and by their continued use today. They were undoubtedly just as important to the prehistoric inhabitants of the valley.

Besides an abundant supply of water, the river also provides regular deposits of nutrient-rich sediments to Boxley Valley. Historically, these sediments have enabled the valley's farmers to grow an abundance of grain crops in successive years (Lackey 1950:15). Such annual renewal of soil nutrients has also been cited as one of the necessary and definitive criteria for the development of complex prehistoric societies (Smith 1978).

The soils at the three sites described in this report were formed in alluvial situations. The Edgmon Site (3NW661) has been mapped as Razort loam, occasionally flooded (Fowlkes et al. 1988). Razort soil is well suited to cultivation, including the kinds of crops grown by both historic and prehistoric subsistence farmers. Its high available water capacity and moderate natural fertility promote the growth of beans, vegetables, and grains. It floods occasionally in the winter or spring, normally less often than once every two years (Fowlkes et al. 1988:63-64).

Razort soil is also mapped over most of the Luallen Site (3NW662). However, the portion of this site adjacent to the river is mapped as Ceda-Kenn complex, frequently flooded. The Ceda-Kenn complex is made up of cobbly Ceda soils, loamy Kenn soils, and other soils including gravel bars. These soils flood at least once annually in the winter or spring. Although the Ceda and Kenn soils were not mapped separately at the Luallen Site, both soils are present and have been described by the Soil Conservation Service (Fowlkes et al. 1988:19-20, 89, 93). These descriptions agree with the recent observations made by SPEARS.

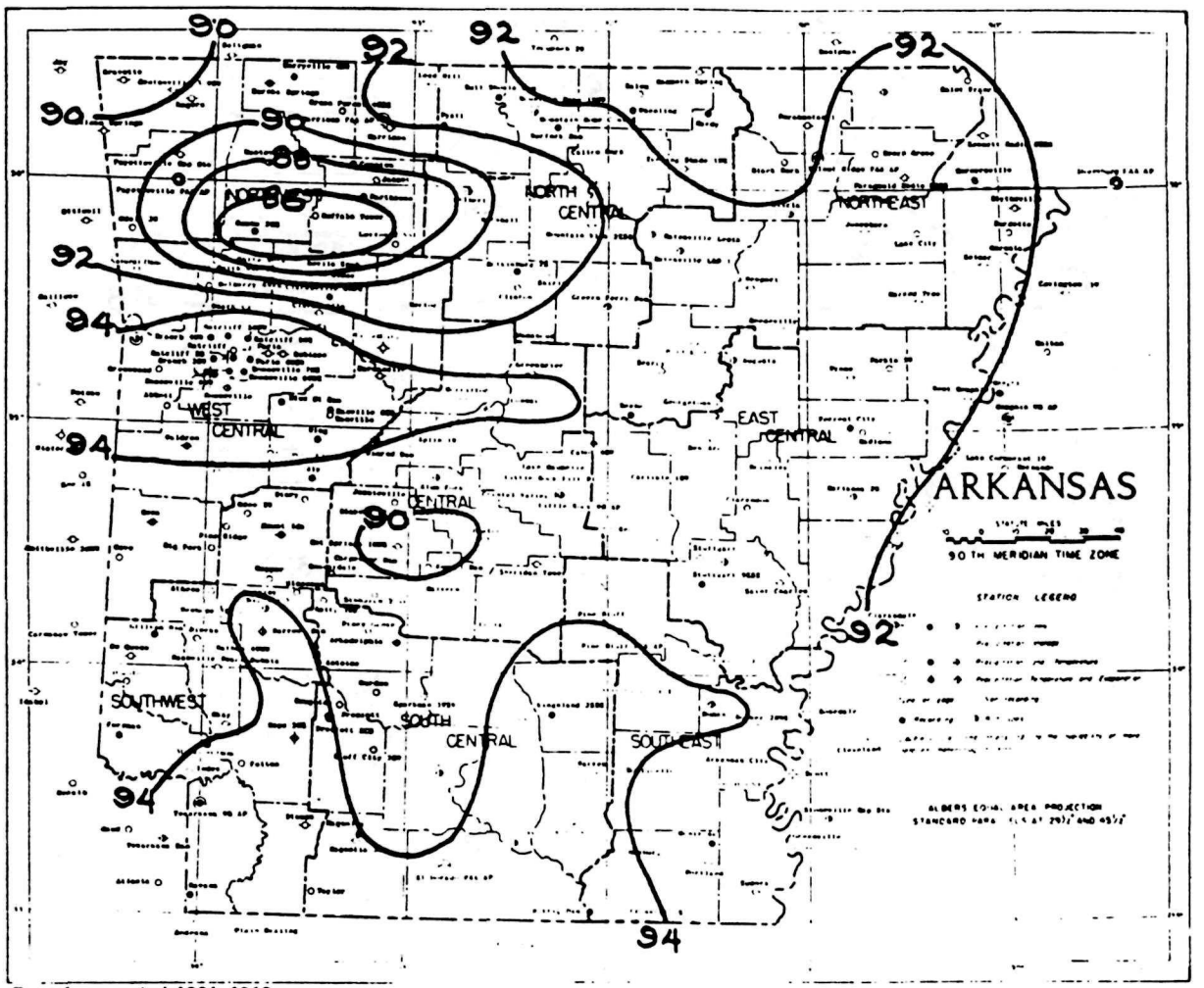
At the Sattler Site (3NW663), Razort loam has also formed on the flood plain along Moore Creek, while the higher and older terrace is mapped as Spadra loam. The mapping of Spadra loam by Fowlkes et al. (1988) included some Kenn soils and some soils with a gravelly surface layer, and these variations were observed by SPEARS at the Sattler Site. Spadra loam has moderate available water capacity and moderate natural fertility; however, it is medium to very strongly acid, and has a severe hazard of erosion.



Based on period 1931-1960
Isolines are drawn through points of approximately equal values. Caution should be used in interpolating on these maps, particularly in mountainous areas.

Figure 6. Mean Annual Precipitation in Arkansas (Reinhold 1959).

Mean Maximum Temperature (°F.), July



Based on period 1931-1960
Isolines are drawn through points of approximately equal values. Caution should be used in interpolating on these maps, particularly in mountainous areas.

Figure 7. Mean Maximum Temperature in Arkansas (Reinhold 1959).

Razort and Spadra soils are not old soils. They are considered to be of intermediate age while Ceda soils are relatively young (Fowlkes et al. 1988:110). The age and occasional flooding of these soils are compatible with the buried cultural components observed by SPEARS. The available water capacity and natural fertility of the soils would have been considerable assets to prehistoric farmers. Razort soil also occurs at 3NW539 where evidence of prehistoric agriculture was preserved (Limp 1985). Notably, these nearly level, productive sediments do not occur farther upstream than the archeological sites investigated by SPEARS. This suggests that prehistoric agriculture may have been restricted to the broad, nearly level flood plain of Boxley Valley and that sites on the sloping, cobbly soils farther upstream may lack evidence of prehistoric agriculture.

In addition to the fine sediments which the river deposits on its flood plain, it also transports larger clasts of chert and sandstone which were important elements in local prehistoric technologies. These materials are deposited on gravel bars within the active channel of the river. The sandstone was used prehistorically for grinding basins, hammers, and other tools. Chert cobbles were reduced to a variety of essential cutting and scraping tools including projectile points, knives, axes, adzes, gravers, and spokeshaves.

For most grindstones, especially large specimens which were stationary while in use, the raw material selected was probably determined by the nearest source of suitable stone (Sprague 1979:75; Spears n.d.). Suitable stone, however, may have been defined by hardness, abrasiveness, or other variables pertinent to particular uses. At Rodgers Shelter in southwest Missouri, dolomite, which occurred naturally at the archeological site, was the preferred material, with sandstone next in frequency among a number of other materials. Limestone and other softer materials were used in very low frequencies (Robinson 1982: 320, 334). Dolomite is not readily available in Boxley Valley; however sandstone, the most ubiquitous stone present, was apparently the preferred material for grindstones. Most of the utilized sandstones found in Boxley Valley archeological sites have well rounded edges and patination. Sandstones were probably procured from the gravel bars adjacent to the sites.

Before use, chert was generally more thoroughly processed than sandstone and required a greater energy input. For this reason, a greater degree of selectivity probably operated among prehistoric manufacturers of chert tools. Archeologists have recognized this and attempted to measure principles of selection by creating a number of analytic categories. Variations in raw material type, distance to source, relative availability, suitability for particular tool types, and tool production sequences are all of archeological interest (cf. Appendix B).

Two distinctive varieties of chert, Boone and Pitkin, were recognized during the present investigations. A third analytic category, "other chert," may represent one or more additional chert types.

The most common chert type is Boone chert. This chert occurs in Boxley Valley in outcrops of the Boone formation (NPS 1985:17), often in very thick units. In upper Boxley Valley, and especially adjacent to the Luallen Site (3NW662), this chert forms resistant beds which have undoubtedly contributed to the thick alluvium observed during the archeological investigations by slowing the river and causing transported sediments to be deposited over the flood plain.

Boone chert is usually light colored and may be highly variable in texture due to fossiliferous or limestone inclusions and weathering. No prehistoric Boone chert quarries have been reported in the vicinity. This lack can be satisfactorily explained by the readily accessible and omnipresent outcrops, whereby quantities of chert may be acquired with no appreciable effort or effect on local exposures. As has been suggested in previous investigations, chert cobbles were acquired from gravel bars, where the higher quality chert cobbles have been selected and proven by tumbling which reduces poorer quality specimens to tiny fragments.

Boone chert also occurs on most hillslopes in Boxley Valley and elsewhere, especially on the Springfield Plateau, as a common residuum which may dominate some soil profiles and be difficult to distinguish in many cases from archeological specimens. This condition prevails especially at the south edge of the Sattler Site (3NW663), and has been otherwise noted in recent archeological investigations (Coleman 1986:7; Lafferty et al. 1988:4).

A second common chert recognized during the present investigations is Pitkin chert. For archeological purposes, this chert and its distribution have been best described in an unpublished paper by Erwin (1972) and by House (1975). It is a distinctive black or gray chert (Appendix B) which occurs as nodules or thin lenses in the Pitkin formation (Easton 1942) stratigraphically above the Boone formation. In Boxley Valley and in the headwaters of the Buffalo River, the Pitkin formation is about 500 feet above the bottom of the Boone formation and the valley floor. Within the Pitkin formation in the vicinity of Boxley, the chert occurs as scattered nodules (Downs 1983:72) which would be difficult to retrieve using prehistoric technologies (Erwin 1972). However, the chert has been transported downslope to the present project locality by tributaries such as Smith Creek and occurs as cobbles on gravel bars. These cobbles, even more so than the transported Boone cobbles, are generally free of defects which might interfere with prehistoric reduction techniques.

The third chert category used in the present study includes cherts from more than one source. Gray, green, brown, and red cherts were classified as "other chert". The gray chert is

likely a variety of Boone chert. The other colors could also be Boone chert varieties, but are just as likely to be undescribed cherts from geologically older formations. An Ordovician rather than Mississippian derivation for these cherts is supported by their more common occurrence downstream from Boxley Valley (Spears et al. 1986; Lafferty et al. 1988; personal observation). The Everton formation is the probable source for these cherts. The Everton formation outcrops in Boxley Valley downstream from the archeological sites reported herein and cherts derived from there would have had to be transported upstream by some cultural rather than natural processes.

A fourth category of siliceous and prehistorically useful materials available in Boxley Valley and recognized during the present investigations is very similar or identical to what has been referred to in the archeological literature as argillite, or, more accurately, argillaceous siltstone (Jurney 1981). This material is more coarse textured than any of the cherts referred to above, but has subconchoidal fracture suitable for use as axes and hoes. This material occurred in low frequencies at the Boxley sites and in some instances was difficult to distinguish from the matrix surrounding Pitkin chert. The more distinctive specimens may have derived from the Atoka formation in the highest elevations of the Boston Mountains.

Other lithic materials and minerals observed in prehistoric contexts in Boxley Valley include hematite and galena. Both of these minerals are suitable for use as pigments. Hematite occurs among conglomerate sandstones along the bluffs above Boxley Valley and in the river cobbles derived from those sandstones. Galena occurs in fissures in the Boone formation. One historic galena mine is located less than 2.5 km from the archeological sites tested (Branner 1900:148).

Other natural resources are not made available directly by the Buffalo River, but their distribution is at least partly determined by the topographic diversity which the river has created. The flora of Boxley Valley has distinctive associations with particular landscape features. Turner (1935) identified seven forest associations in northwest Arkansas. These associations are distinguished primarily by a climate gradient which becomes progressively drier from east to west and by soil conditions, including available moisture. Turner thought the associations to be best described as sub-climax types, chiefly because of a post-glacial westward migration of the species involved (Turner 1935:417). However, throughout all of the forest associations, only a few genera are predominant, chiefly oaks, hickories, shortleaf pine, and eastern red cedar (Read 1952:240).

Within Boxley Valley during any particular time interval, climate had appreciably less influence on forest associations than soil type, aspect, and slope. However, over the long period of the Holocene, there may have been significant variation within a single locality, especially if the area was once much dryer, as most evidence suggests. This dryer period probably occurred a

few thousand years ago and the modern species recorded by Turner (1935) and Read (1952) are not significantly different than those recently identified in a late prehistoric archeological context in the same area (Lopinot 1988). Although forest resources were undoubtedly used in a variety of ways, the prehistoric use of nuts for food has been well documented; and the mixed oak-hickory forests in Boxley Valley would have provided an abundant source of nuts. Hilliard (1980:24) has stated that "the best nut producing areas in the Ozarks are the mesophytic slope exposures and stream and river valleys."

The major variation in forest types and in the distribution of nut bearing species occurs between the moister northerly slopes and dryer southerly slopes (Hilliard 1980:22). There is, additionally, a more open forest on the dry sandstone summits of the highest mountains where prairie grasses, forbs, and shrubs may occupy a considerable portion of the surface (Cozzens 1940; Read 1951).

These forest environments are reflected in the faunal assemblage of the region, which is also comprised of mostly forest-dwelling species with only a few prairie species represented (James et al. 1979). An analysis of faunal remains from archeological contexts in bluffshelters led to the conclusion "that no major changes have taken place in either the composition or distribution of biotic communities here since the major occupation of the bluffshelters (A.D. 500 to A.D. 1400)" (Cleland 1965:61). Another list of species, also from a late prehistoric context in the Buffalo River Valley, is likewise entirely compatible with the modern faunal community (Scott 1988:198).

PREVIOUS ARCHEOLOGICAL RESEARCH

The first systematic investigations of the prehistoric occupation of the Arkansas Ozarks was undertaken by M. R. Harrington for the Heye Foundation Museum of the American Indian in the early 1920s. Harrington's interest in the area had been stirred by well-preserved woven fiber artifacts which he had observed in private collections. Harrington's explorations began on the upper White River near Eureka Springs, but later shifted to the White River near the mouth of the Buffalo River. He visited sites up the Buffalo River to near Panther Creek in Marion County, and also investigated two shelters in south-central Newton County near the town of Nail. Harrington was particularly interested in dry shelters where such perishables as basketry and bone, cane, and wooden artifacts were preserved. Based on his findings, he defined a Bluff-Dweller Culture, to which he assigned most of the artifacts he had recovered, and also recognized a Post-Bluff-Dweller occupation which he thought might represent the Osage or other closely related Siouan tribe. He found only slight evidence of Pre-Bluff-Dweller occupation (Harrington 1960).

The well-preserved organic artifacts in the dry shelters, some of which were described by Gilmore (1931) in a report identifying the plant species, soon attracted the attention of other museums, including the Smithsonian Institution and the University of Arkansas. For the former institution, Winslow Walker excavated shelters on and near the Buffalo River in Marion and Searcy counties (Walker 1932). For the University of Arkansas Museum, S. C. Dellinger directed the excavation of at least three shelters in Newton County and many more elsewhere in the Arkansas Ozarks from 1928 to 1935. Included among those was Cob Cave (3NW6) which is located in a side canyon of Boxley Valley. No comprehensive analysis or report of Dellinger's work was undertaken; however, his collections have since contributed valuable data to several subsequent investigations (Dellinger 1936; Dellinger and Dickinson 1942; Payne and Jones 1962; Cleland 1965; Scholtz 1975; Raab 1976; Cobb 1976; Trubowitz 1980; Fritz 1984; 1986).

Three stratified bluffshelter excavations, only one of which is in the vicinity of the Buffalo River, have become important to interpreting the prehistoric cultural sequence of Boxley Valley. In the early 1960s, the University of Arkansas Museum, under a cooperative agreement with the National Park Service, conducted excavations at Breckenridge shelter near the White River prior to the creation of Beaver Reservoir. This shelter had been previously investigated by Harrington (1960:9-22), who discovered deep deposits but was unable to determine their age. The University Museum excavators, on the other hand, determined that artifacts in the lowest strata were of considerable age and were able to establish a sequence of change in projectile point styles upward through the deposits (Wood 1963; Thomas 1962; 1968). One of the earliest projectile point types identified at Breckenridge has since been associated in Oklahoma with a radiocarbon date of 9,416 +/- 193 B.P. (Wyckoff 1985:14).

At nearly the same time the Breckenridge excavations were being conducted, amateur archeologists were also excavating two other shelters which became important because of their deeply stratified deposits. In Searcy County, along Calf Creek, a tributary of the Buffalo River, Don Dickson discovered in a cave that had already been badly disturbed a sequence of projectile points comparable to the Breckenridge sequence. One particularly early basal notched projectile point form has become known as the Calf Creek type (Dickson 1970).

The Calf Creek type also occurred in the second of the shelters being excavated by amateur archeologists at that time. This second shelter was located on Tom's Brook in Johnson County at the southern margin of the Ozarks. Calf Creek points were referred to as "Type A" at the Tom's Brook shelter where they also occurred deep in the stratigraphic strata (Bartlett 1963). Other distinctive projectile point type in the older strata which have become useful indicators of early cultural affiliation include Rice Lobed (Chapman 1975:254; Kay 1982:444-445), Johnson (Schambach 1970:131-134), and Big Sandy (Bell 1960:8-9).

Since these excavations little stratigraphic data have been obtained from the Buffalo River area. With the creation of the Buffalo National River came a legal mandate to inventory and protect the cultural resources. This inventory was begun in 1973 by the Arkansas Archeological Survey with a reconnaissance survey which included an assessment of previously recorded sites (Wolfman 1979).

Although Wolfman noted that increased visitor use had already begun to impact the cultural resources along the river and recommended further work to identify the resources and mitigate the effects of site destruction, his recommendations were not pursued in a timely manner. The intensive survey which he recommended has been implemented only in a piecemeal fashion as proposed park developments have threatened particular localities or sites. The recent archeological literature for the Buffalo National River is a diverse assemblage of reports of investigations at particular visitor use areas such as campgrounds, canoe launch facilities, and trails. No comprehensive research design has guided these investigations. They have instead resulted from implementing recreation plans which thus far have given little emphasis to interpreting the cultural resources of the park:

> The prehistory of Buffalo National River, including Boxley Valley is not well known because of the limited amount of research that has been undertaken in the area. ... While tangible remains of prehistoric occupations (campsites, village sites, burial grounds, inhabited caves, small mounds, and pictograph sites) have been identified within the Buffalo National River, little is known about the few prehistoric sites identified within Boxley Valley because only limited effort has been undertaken to define their size, cultural affiliation, or significance [NPS 1985:19].

Recent investigations in Boxley Valley are described below. These could be considered typical of other recent investigations throughout the park except that Boxley Valley represents a unique management situation which has necessitated the inventory of a greater land area there than elsewhere in the park:

> The legislative history of the act establishing the park clearly identifies Boxley Valley as an area to remain in private use, thereby retaining the rural agricultural setting. The purchase of scenic easements, leaseback, or sellback with deed restrictions was presented to Congress as the management intent for Boxley so that landowners could remain on their land and continue farming. ... The master plan does not provide details on management of the valley, and for various reasons, the Park Service has acquired fee-simple ownership of most of the valley [NPS 1985:1].

Since 1985, the Park Service has been more intensively inventorying the cultural resources of Boxley Valley in

preparation for selling several tracts of land back into private ownership.

In 1979, James Bradford of the National Park Service reported on a survey of the access to Lost Valley, a side valley of Boxley Valley which was a state park until acquired by the Park Service. A large and archeologically significant bluffshelter known as Cob Cave (3NW6) is located in Lost Valley and had been excavated in 1931 by the University of Arkansas Museum. Bradford located one site, 3NW500, near the entrance to Lost Valley (Bradford 1979). This site was subsequently tested in 1985 and adjacent areas were also surveyed, but the results of these further investigations, a joint National Park Service-Tennessee Valley Authority project, have not been reported. However, during this later survey two prehistoric features were discovered eroding into the Buffalo River near Lost Valley. One of the features was excavated by the Park Service and the other feature and a third additional feature were soon afterward salvaged by the Arkansas Archeological Survey (Limp 1985).

The site with which the features were associated was designated 3NW539. The limits of the site have yet to be determined. The contents of the pit features have not been analyzed (Limp 1985:1, 49). However, field and laboratory observations were however reported by Limp, and the features were assigned to a late prehistoric occupation of Boxley Valley with a probable date of A.D. 900-1400 (Limp 1985:2). Associated artifacts included shell tempered ceramics, arrowpoints, sandstone metates, and well-preserved floral and faunal remains (Limp 1985:49-50).

In September 1985, the Park Service contracted with Mid-Continental Research Associates for an archeological survey with testing of a 13-acre tract in Boxley Valley proposed for sellback to previous landowners (Spears and Lafferty 1985). This survey resulted in the discovery of one site, 3NW534, which was determined to be, in itself, not eligible for inclusion on the National Register of Historic Places because it had been previously disturbed. However, the investigators pointed out that, because so little was known about Boxley Valley, such sites as 3NW534 did contain useful data relating to settlement patterns in the valley. They recommended that proposed private development avoid the higher artifact density areas on the site and that ground altering activities be reinvestigated by qualified archeologists (Spears and Lafferty 1985:19). Those recommendations were considered by the Park Service and the site was subsequently twice revisited (James E. Bradford, personal communication; Yakubik et al. 1988:156-163) with later investigators confirming the observations in the initial study (Spears and Lafferty 1985).

In April 1986, the Park Service conducted a reconnaissance survey of a 3-acre tract proposed for sellback to private ownership and approximately five miles of proposed trail segments (Coleman 1986). This survey resulted in descriptions of one previously recorded and four newly discovered prehistoric sites. Two bluffshelter sites were determined to be eligible for nomina-

tion to the National Register of Historic Places, and the other three sites were recommended for additional testing to determine their eligibility for nomination (Coleman 1986:i).

One of the sites recommended for additional testing by Coleman (3NW611) was located on the 3-acre tract proposed for sellback (Coleman 1986:10-12) and has been recently tested by Historic Preservation Associates. The final report of those later investigations is not yet available, however, preliminary observations on a supplement to the state site form on file in the Registrar's Office of the Arkansas Archeological Survey state that the site size is much larger than reported by Coleman (1986) but that artifacts are apparently restricted to the surface and near surface of a low terrace being eroded by Beech Creek.

The other four sites reported by Coleman (1986) were subsequently revisited by Earth Search, Inc., during a survey of 649 additional acres proposed for sellback into private ownership (Yakubik et al. 1988). Coleman's recommendations for these sites, 3NW118, 3NW612, 3NW613, and 3NW614, were reaffirmed by the Earth Search investigators who conducted surface collections and shovel tests and recommended additional subsurface testing to obtain data necessary to complete the nomination form for inclusion of the sites on the National Register of Historic Places (Yakubik et al. 1988:199-218, 227-231).

Earth Search investigators located a total of 31 sites in their survey. Nineteen prehistoric sites were determined to be potentially eligible for nomination to the National Register of Historic Places and further subsurface testing was recommended for these sites to assess their significance and/or to collect data necessary to complete the National Register nominations. Two historic archeological sites were also found to be potentially eligible for inclusion on the National Register of Historic Places; however, no further work was recommended for these historic archeological sites, unless they are threatened by ground disturbing activities, because they are associated with standing historic structures which had previously been recommended for inclusion on the National Register (Yakubik et al. 1988:130, 196, 271-273). This reviewer notes as a result of discussions with John Knoerl at a recent National Register workshop that such archeological sites are not adequately protected by nominations of standing structures unless the archeological component is specifically assessed and included on the nomination form for the structures (which is unlikely in this case since adequate archeological data were not available).

The three sites discussed in the present report, 3NW661, 3NW662, and 3NW663, are also included in proposed sellbacks to private owners. These sites were discovered during the same joint National Park Service-Tennessee Valley Authority project in 1985 which discovered the features at 3NW539, and neither the field notes nor any report of that survey are available. The only site data available to SPEARS at the initiation of the present investigations were distribution maps of the shovel tests

excavated during the 1985 survey. Numbers of artifacts in each shovel test are included on the maps, but no descriptions of the artifacts or sediments were provided. Site maps and descriptions accompanying the state site forms for each of the sites are projections based on the numbers of artifacts in the shovel tests and have been found as a result of SPEARS investigations to be inaccurate and misleading. These deficiencies are discussed elsewhere in the present report.

Note that all of the previous archeological research in Boxley Valley, with three exceptions, consists of reconnaissance and intensive surveys which have provided little data on cultural affiliation. The three exceptions unfortunately provide little more in the way of available information than the surveys. The 1931 excavations at Cob Cave (3NW6) have never been reported, and only the perishable artifacts from that site have been analyzed (Scholtz 1975). The excavations at 3NW539 were extremely limited in scope and those artifacts also have not been analyzed (Limp 1985). Finally, the report of subsurface testing at 3NW611 is not yet available.

Other sites downstream from Boxley Valley have been tested to determine their significance, but because of the limited extent of those tests, the data are also of limited use in interpreting the prehistory of Boxley Valley. The major result of those testing projects has been to demonstrate that sites on the flood plain and terraces of the Buffalo River are likely to have deeply buried and stratified components (Sierzchula 1984; Spears et al. 1986).

One other area along the Buffalo River has been somewhat more intensively investigated. Near Erbie, two sites which were to be impacted by proposed canoe launch facilities were tested by the Arkansas Archeological Survey (Williams et al. 1986). The investigators found intact subsurface cultural deposits and recommended that the adverse impacts of the canoe launch be mitigated by further excavation. This further work was conducted by Mid-Continental Research Associates (Lafferty et al. 1988), who found at one site evidence of a late prehistoric house dating A.D. 1350, as well as an earlier component. At the second site, mitigation efforts were so restricted by the scope-of-work that useful data could not be obtained.

CULTURAL PREHISTORY

Previous archeological research in Boxley Valley has been inadequate for constructing a reliable sequence of prehistoric development. This is also true in a general way of the entire Buffalo River and the southern Ozarks. It is significant that several of the previous investigators have made no attempt to present a cultural sequence in their reports (Limp 1985; Williams et al. 1986; Klinger and Hinkle 1986). Other investigators have used a broad geographic area surrounding the Ozarks to derive a synthetic sequence (Sabo et al. 1982; Sierzchula 1984; Spears and

Lafferty 1985; Spears et al. 1986; Yakubik et al. 1988; Lafferty et al. 1988). Coleman (1986) simply adapted the sequence in Sabo et al. (1982) with no discussion.

Discussion on this matter is certainly needed. Contrary to their assertion, the sequence presented by Sabo et al. (1982:49, Table 19) (Figure 8) is not "based entirely on chronometrically monitored stratigraphic associations" (Sabo et al. 1982:48); or at least the chronometric monitoring is inadequate, as evidenced by the lack of dates for many of the cultural phases they list. Although the general sequence presented by Sabo et al. is widely accepted, recurring discrepancies among postulated dates for some portions of the sequence, especially the terminal date for the Late Archaic, need to be seriously considered. However, extensive discussion will not be undertaken here. Instead, evidence of cultural affiliation or chronology from the vicinity of Boxley Valley will be briefly presented and compared to the currently accepted general sequence of cultural development.

Paleo-Indian Period

The oldest cultural period recognized in the southern Ozarks is the Paleo-Indian period. The generally accepted dates for this period are 10,000-8,500 B.C.; however, dates with good associations are rare and none have been obtained in Arkansas. The period is defined on the basis of distinctive lanceolate and fluted projectile points, although other tool types have been found in association at mammoth and bison kill sites on the Great Plains (Irwin and Wormington 1970). Within the Arkansas Ozarks only the projectile points have been reported, and in very few numbers. Of 13 fluted projectile point specimens reported by Newton (1975-77), and this is practically the entire sample available, five are from Newton County. Of these five, four were found along the Buffalo River and one along Cave Creek, a tributary of the Buffalo. All were single finds on multi-component sites. Three of the five were found in bluffshelters and two were found on the second terrace above the Buffalo river. Among the three sites investigated by SPEARS, only at the Sattler Site (3NW663) is a terrace of this age exposed and there is a potential for a Paleo-Indian fluted point component on that terrace. Paleo-Indian components at 3NW661 or 3NW662 would be deeply buried if they are present.

Sabo assigns other lanceolate but unfluted projectile points to the Paleo-Indian period. However, the associated radiocarbon date cited from Oklahoma falls into the range of a later cultural period (Sabo et al. 1982:52). The date from Oklahoma was associated with a lanceolate projectile point referred to as an Agate Basin (Sabo et al. 1982:52). It has been subsequently described and renamed by Wyckoff (1985) as a Packard point after the name of the type site. A similar projectile point was found at Breckenridge shelter in Arkansas (Sabo et al. 1982:52). In fact, besides the artifact described as an "Agate Basin (?)" by Wood (1963:83, Figure 5n), there are five additional specimens of probably the same type from Breckenridge, although they are

Table 19. Prehistoric cultural sequence for the Arkansas Ozarks

Cultural Period	Cultural Phase	Date Range	Radiocarbon Dates*
Mississippi	Neosho	300-450 BP	330 ± 140 (BETA-3973)
			450 ± 105 (Uga-3942)
	Caddo	450-1,100 BP	770 ± 60 (BETA-3975)
			980 ± 70 (BETA-3976)
			1,010 ± 60 (BETA-3974)
Woodland	Late Woodland	1,100-1,350 BP	1,100 ± 75 (Uga-3941)
	Middle Woodland	1,350-1,800 BP	
	Early Woodland	1,800-2,500 BP	
Archaic	Late Archaic	2,500-5,000 BP	2,850 ± 120 (Uga-3940)
	Middle Archaic	5,000-8,000 BP	
	Early Archaic	8,000-9,500 BP	8,410 ± 245 (Uga-3939)
Transitional	Dalton	9,500-10,500 BP	
Paleo-Indian	Paleo-Indian	10,500-12,000 BP	

(Modified after Dickson 1982 and Kay 1980, 1982).

*all radiocarbon dates are given in radiocarbon years before present, and are from stratified contexts at the Albertson site (3BE174) and the Huntsville site (3MA22)

Figure 8. Chronological Sequence for Ozark Cultures Postulated by Sabo et al. (1982:49).

referred to as "unclassified beveled lanceolate" (Wood 1963:83, Figure 5a-e). In addition, a specimen from Breckenridge described as a "Nolan" (Wood 1963:83, Figure 5o) may be a preform for a Packard point. Wyckoff (1985:14), however, apparently accepts only two of these specimens as Packard points. Wyckoff also notes that artifacts belonging to the Packard complex are predominantly of local materials (Wyckoff 1985:23). One Packard point found during SPEARS current investigations on the surface of the Sattler Site, (3NW663) is made from Pitkin chert which is locally available.

With so few diagnostic artifacts and known sites, it is difficult to construct adequate descriptions of Paleo-Indian lifeways. Sophisticated models of migratory band-level societies have been postulated, based on apparent associations with Pleistocene megafauna and a climate dominated by retreating glaciers. However, "we really have no idea what Paleo-Indian social organization was like, and certainly considerable regional variation in social patterns should be expected among a people occupying so vast a continent as North America" (Sabo et al. 1982:54).

Dalton (Transitional) Period

Following the Paleo-Indian period, adaptations to a rapidly changing environment may account for a cluster of artifacts, including a distinctive lanceolate, basally thinned projectile point. The assemblage is diagnostic of a transitional period, often referred to as the Dalton period after the name of the distinctive projectile point. The accepted time span of this period is 8,500-7,900 B.C. (Goodyear 1982).

Varieties of the Dalton projectile point occur throughout the southeastern United States, accompanied by endscrapers, naturally backed knives, burins, adzes, and edge-ground cobbles that are also distinctive and diagnostic. In the Arkansas Ozarks a variety of the Dalton point has been referred to as a Breckenridge point after Breckenridge shelter where it was first described as (Wood 1963). Dalton period subsistence strategies and social organization have not been adequately described, but are thought to be comparable to those of the preceding Paleo-Indian period, lacking, however, the large late Pleistocene fauna.

No artifacts definitely assignable to the Dalton period were found during SPEARS investigations in Boxley Valley, and none have been reported there by previous investigators. Dalton projectile points have, however, been reported farther downstream (Lafferty et al. 1988); and the gravelly terrace at the Sattler Site (3NW663) is old enough that a Dalton component could be present. A fragment of a lanceolate projectile point similar to the Breckenridge variety of the Dalton type was found at the Sattler site and probably represents occupation of the site during the succeeding Early Archaic period.

Archaic Period

By the end of the Dalton period, the climate was probably much less influenced by glaciers, and several new projectile point styles of approximately equivalent age are thought to indicate successful adaptations to a variety of regional environments. Unfortunately, these new projectile point types are not adequately segregated or dated. Sabo et al. (1982:57-60) collapsed two generally accepted subdivisions of the Archaic period, Early and Middle Archaic, into a single unit for their discussion. Although they justified this consolidation on the basis of a lack of evidence for adaptive change among populations, they referred to a major climatic change, the onset of a hypsithermal or warm and dry period. This period occurred at the same time as the date usually associated with the end of the Early Archaic, i.e., 6,000 B.C. (Sabo et al. 1982:58). The apparent lack of evidence for adaptive change probably more accurately reflects a lack of stratigraphic and chronological control of the components containing the various projectile point types. It is interesting that the projectile point types listed by Sabo et al. (1982:57) as occurring in both the Early and Middle Archaic were first recognized in previously disturbed rockshelters which were then excavated using arbitrary vertical excavation levels of 15-40 cm. The one type, Calf Creek, for which there is qualifying evidence indicating an Early Archaic origin was recovered in comparatively good context at the base of a shelter which had been excavated using six inch levels (Dickson 1970).

Scholtz (1969:55) postulated a population increase during the Middle Archaic period, 6,000-3,000 B.C., as well as a greater use of wild plant foods, indicated by grinding tools. House's observation (1965:12) that bluff-top sites are predominantly Middle Archaic supports the hypothesis that more diversified subsistence strategies were developing during that period. There is also evidence from elsewhere that some populations were becoming more sedentary during the Middle Archaic. During SPEARS excavations at the Sattler Site, 3NW663, a Big Sandy projectile point, which is a Middle Archaic diagnostic, was found in association with grinding basins and charred nuthulls in one of two pits which may represent food storage features. Nuthulls from the pits provided radiocarbon dates of 4,420-4,925 B.C. (Beta-26213, corrected). Significantly, these are the only existing dates from Middle Archaic features on an open site in the Arkansas Ozarks.

As with the Early and Middle Archaic periods, Sabo et al. (1982:61-64) have also collapsed the two succeeding periods into one discussion. Again, this consolidation was justified by reference to a climatic interval, a period of greater moisture associated with the spread of oak-hickory forests (Sabo et al. 1982:62). Both the Late Archaic and Early Woodland cultural periods appear to have in common numerous stemmed and corner notched projectile point types along with evidence of horticulture and tropical cultigens. Thus far, the two periods have been

distinguished by the introduction of clay tempered or sand tempered ceramics marking the beginning of the Woodland period. The earliest ceramic types have not been recognized in the Arkansas Ozarks, and for this reason various terminal dates for the Late Archaic period have been suggested. Sabo et al. listed a date of 1,000 B.C. in their Table 19 (Sabo et al. 1982:49), but as noted above they attached little significance to that date in terms of cultural development. Scholtz, in his summary of northwest Arkansas prehistory, had access to very few radiocarbon dates but assigned a date of A.D. 1,000 to the end of the Late Archaic, citing a lag in cultural development in the Ozarks (Scholtz 1969:53). He apparently accepted the concepts of belated and marginal cultures proposed by Willey and Phillips (1958:74-77). Wolfman, too, in his assessment of the cultural sequence in the Buffalo National River, accepted the concept of marginal cultures and proposed a terminal date for the Late Archaic of A.D. 1 (Wolfman 1979:21).

These concepts have already received some recent discussion (Brown 1984), but this aspect of our interpretations of cultural change is still unresolved and needs at least some new consensus definitions. Even the most recent investigations in the Buffalo National River have not resolved this problem. Lafferty et al. (1988:16, 91) prefer a date of A.D. 150 for the end of the Archaic period, again citing marginality or "montane conservatism." However, Lafferty et al. found the absence of ceramics to be a significant research topic for which they presented several hypotheses bearing on the question of when the Late Archaic to Woodland transition occurred (Lafferty et al. 1988:377).

Woodland Period

Early Woodland ceramics are apparently rare and perhaps absent from the Arkansas Ozarks. However, the search for Early Woodland components has hardly been thorough. SPEARS current investigations at the Luallen Site (3NW662) have demonstrated the presence of a Woodland component represented by Gary projectile points having a Woodland morphology (Schambach 1970:188-206; 1982:173-177) and by clay tempered sherds. These artifacts were recovered from intact middens indicating the presence of a significant Woodland period component which has the potential for resolving some of the questions about Woodland occupations in the Ozarks.

Certainly, Middle Woodland components have been documented in the Ozarks, although the nature of the Middle Woodland occupation has not been defined. Distinctive incised and zone stamped pottery has been recognized at several bluffshelters, including Falling Water Falls shelter in Pope County on a tributary of Buffalo River, where six decorated and 58 plain clay tempered sherds were recovered from disturbed contexts (Gregoire 1971). SPEARS archeologists observed one zone stamped rim sherd in a private collection from a bluffshelter in Boxley Valley.

Archeologists have noted the difficulty of separating Middle and Late Woodland components due to the apparent continuity of several projectile point types through both periods, A.D. 150-850 (Sabo et al. 1982:65-67). Again, this problem may result from a lack of stratigraphic control and the rarity of good contexts for the artifacts. It appears that during the Woodland period Ozarks populations were being influenced by both Hopewell culture from the north and Fourche Maline culture from the Arkansas River Valley to the south and that the bow and arrow were introduced to the Ozarks just prior to A.D. 850 (Sabo et al. 1982:65-66).

Mississippi Period

The bow and arrow and shell tempered pottery have often been used as markers of the Mississippi period, with commonly accepted dates of A.D. 850-1,650. However neither of these artifact types are sufficient or necessary to define Mississippian culture, which is more accurately characterized by ranked societies organized into chiefdoms. These chiefdoms were supported by a mixed agricultural subsistence base supplemented to varying and sometimes prominent degrees by hunting and fishing. Cultigens included corn, beans, and squash; and all of these have been found in the Ozarks.

Bruce Smith (1978) has proposed that these societies were dependent on a seasonal input of energy into their economic system through the deposition of soil nutrients during floods, and that the major and most distinctive Mississippian developments occurred in river valleys with broad flood plains with numerous abandoned channels and oxbow lakes. While the flood plains provided fertile agricultural soils, the lakes provided a superior habitat for wild plants and animals.

Boxley Valley lacks the abandoned meanders and oxbow lakes, but the flood plain soils are replenished annually by flooding. Historically the valley soils have supported intensive grain agriculture (Lackey 1950:15), and there is evidence of prehistoric agriculture in Boxley Valley as well. Cob Cave, 3NW6, a large shelter in a side valley of Boxley Valley, is named for the many corn cobs which were found there. Limp has stated that the investigators who preceded his own work at 3NW539 also reported corn from a Mississippian pit feature (Limp 1985:50). Lafferty et al. (1988) reported corn and squash in association with Mississippian features at 3NW205 downstream from Boxley Valley. The diverse topography and mixed forests support an abundance of wildlife including deer, turkey, squirrels, and fishes, all of which have been recently recovered from archeological contexts at 3NW205 (Lafferty et al. 1988).

There is also evidence that the Mississippi period occupants of Boxley Valley and elsewhere in the Ozarks participated in broad social and ceremonial systems including the Mississippi River Valley and the Caddoan culture of the Arkansas River Valley. Although the large mound complexes of the river valleys are

rare in the Ozarks, at least four sites with ceremonial mounds have been reported (Sabo et al. 1982:73-75; Sabo 1986). In Boxley Valley, a burial recovered from a cave near the present project area contained a shell tempered jar and arrowpoints demonstrating a Mississippi period association, along with shell beads and pendants made from marine whelks (Waters 1973). This site is on a hillslope above the Luallen Site (3NW662), and SPEARS investigations at the Luallen Site also recovered shell tempered sherds and several varieties of arrowpoints.

Whether the primary cultural influence on Boxley Valley during the Mississippi period derived predominantly from the Mississippi Valley or the Arkansas Valley is a topic of current archeological interest. Sabo et al. (1982) cited evidence of Caddoan affiliation, but Wolfman (1979:38) noted that Mississippi period sites occurred in higher percentages in the Marion and Searcy Counties portion of the Buffalo River than in Newton County and suggested that Mississippi influence may have been moving up the Buffalo River from the lower White River. Scholtz (1975:151) noted that much of the basketry from Cob Cave (3NW6) was unlike that from bluffshelters to the west and, additionally, was unlike any in published references on historic and prehistoric materials elsewhere. Her concluding observation indicates a possible direction for future research in Boxley Valley and for the broader Ozarks:

> The unique nature of some of the interlaced cane basketry from Cob Cave, combined with the essentially different complex of rim forms of interlaced basketry from this site, would seem to indicate that perhaps Cob Cave was the site of an occupation which is not found in any of the other shelters. It is also possible that the differences in the Cob Cave sample simply reflect social-structural patterns of a loosely organized and scattered Ozark population. The presence or adequate interpretation of such patterns will remain largely unknown until more analyses of the Ozark bluff shelter occupations are accomplished [Scholtz 1975:151].

Protohistoric and Historic Native Americans in Boxley Valley

During the eighteenth century the Ozarks were part of the hunting territory of the Osage. All known Osage villages were located in the Missouri portion of the Ozarks, but hunting camps should be present in Arkansas. Thus far none have been identified. After 1804 the Osage were removed to Oklahoma but continued to hunt in the Ozarks (Sabo et al. 1982:76).

In 1817, the Cherokee were give a reservation in Arkansas in what had been Osage territory and which included all of what is now the Buffalo National River. Although Pitcaithley reports that two Cherokee settlements may have been located on the Buffalo River or its tributaries in Searcy County, these have not been

archeologically documented (Pitcaithley 1976:54-55); and it is unlikely that the Cherokee settled in any numbers in the area.

Chapter 4

FIELD AND ANALYTICAL METHODS

Carol S. Spears

FIELD METHODS

This Boxley archeological project involved the testing of three prehistoric sites, the Edgmon Site (3NW661), the Luallen Site (3NW662) and the Sattler Site (3NW663), for significance in terms of the National Register of Historic Places. Testing included a combination of archeological methods: (1) plowed transects, (2) backhoe trenches, (3) excavation units, (4) scraped areas, and (5) site mapping.

SURFACE EXAMINATIONS

Areas outside the plowed transects on all three tracts were examined for surface material. In these locations, only tools and diagnostic artifacts were collected. Particular attention was given to eroded surfaces, roads, animal trails, and bank profiles.

Plowed Transects

The location of the plowed transects were established using a Brunton compass and flagging according to maps supplied in the Scope of Work (Appendix E). Disking was not an effective method for turning the soil due to dense fescue roots. For this reason, a breaking plow was used. At the Luallen (3NW662) and Edgmon (3NW661) Sites, six to eight furrows with a one blade plow were made on each transect. This method exposed an area about ten to twelve feet wide. This plowing was accomplished by Sam Huber who manages the fields under an agriculture use permit. At the Sattler Site (3NW663) the plowing was accomplished by Paul Villines who used a three blade turning plow. He made two passes along each transect exposing about a ten foot wide transect. The visibility in all plowed transects was excellent (95-100%).

All artifacts observed in the plowed transects at the Edgmon and Sattler Sites were flagged and mapped. Distances were measured with a metric tape from one end or from an intersection of the transects. These locations were mapped with transit and tape and tied into a permanent datum. Due to the high density of material at the Luallen site, a sample of the area (Plowed Transects A through D and part of E) was investigated in this manner. At this site, three controlled surface collections were conduct-

ed. Each unit consisted of a 3 m x 3 m area. The remainder of the plowed transects were examined on several occasions and diagnostic artifacts were flagged, collected, and mapped using a transit, rod, and tape.

SUBSURFACE TESTS

Backhoe Trenches

Twenty-three backhoe trenches were excavated at the three sites. The trenches were used to (1) determine if cultural strata and features existed below the plowzone, (2) determine the probability for deeply buried cultural deposits, and (3) allow for the collection of information useful to understanding the geomorphology of the landscape.

All trenches were dug with a John Deer backhoe and two foot wide bucket owned and operated by Paul Villines. For safety reasons, trenches were excavated double wide and all were marked with stakes and day glow flagging. Portions of several trenches on the flood plain of the Buffalo River (3NW662) were unstable and caved in. One trench at the Edgmon Site (3NW661) filled with ground water.

Backhoe Trenches remained opened for several weeks until they were documented by project archeologists and/or the geomorphologist. One wall in each backhoe trench was cleaned scraped, photographed (color and B/W), and drawn. The other wall of each trench was briefly examined for features, anomalies or artifacts.

A line level string was positioned between two nails in the profile; these were shot in with a transit so that elevations of cultural and natural levels across the site could be compared. The soil levels and artifacts were measured above and below the string level. Sediments were described according to texture, content and color. All artifacts found below the plowzone and middens were mapped on the profile drawing and collected by provenience. All Munsell colors were taken on saturated soils by the same person for the entire project. The project geomorphologist extracted sediment samples of strata from several trenches for size analyses and geomorphic interpretations (Chapter 2).

The location of each backhoe trench was mapped with transit, tape, and rod. All trenches were backfilled toward the end of the project. Aluminum cans were placed into the bottom of each trench prior to backfilling.

Scrapes

A total of 19 scrapes were dug by Paul Villines using his John Deer backhoe/scraper. For the scrapes at the Edgmon and Sattler Sites, the backhoe bucket was used to remove the bulk of the plowzone and then the blade scraped the surface as clean as possible. This technique worked adequately for the gravelly and

clayey sediment except that the tire treads caused compacted depressions. At the Luallen Site a smooth blade attachment for the backhoe bucket (designed by Dr. Robert L. Lafferty, Mid-Continental Research Associates) was used. This technique was much more effective in the sandy sediments.

During mechanical scraping, one or both archeologists watched for features and artifacts. As soon as the scrape was completed it was covered with plastic to hold in moisture. The scrapes were hand cleaned with sharpened hoes and trowels and examined for feature stains and artifacts. They were photographed and information was recorded on a Scrape Form. Small stains were cross sectioned. Large pit features and extensive middens were recorded and mapped.

Test Units

Test units were laid out according to magnetic north, and all depth measurements were made from the line level string attached to the southwest corner of the unit. The plowzone was excavated in 10 cm levels. All other levels were excavated according to cultural or natural levels of not greater than 10 cm in depth. Levels were shovel skimmed or troweled and all soil removed was dry screened through 1/4 inch mesh. The base of each level was scraped with a trowel and examined for features. If feature stains or clusters of artifacts were found, they were given a separate provenience number, mapped, described, and photographed. Once each unit was completed, one wall was clean scraped, photographed and profiled. Soil colors were described according to the Munsell color designations.

SITE MAPPING

All backhoe trenches, test units, and plowed transects were mapped using a transit, metric rod, and 100 meter tape. Where possible, the measurements were taken from already established permanent data. Elevations were computed from arbitrary data. Transit stations not positioned on permanent markers were staked, flagged, and tied into natural markers. All azimuths and distances were recorded in field notebooks which will be placed on file with the National Park Service and the Arkansas Archeological Survey.

LAB METHODS

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 over 10,000 specimens, the majority of which are prehistoric lithics.

Analysis was accomplished over a period of six days, by Project Archeologists Robert A. Taylor and Carol S. Spears. The units and type of artifacts were counted and recorded on the

Boxley Analysis Form developed for this project (Appendix A). Lithics in each provenience unit were sorted by raw material and by artifact class as described in Appendix B. Bone, shell, burned clay, and charcoal were identified and counted. These categories as listed on the analysis form are considered self explanatory. Diagnostic lithic artifacts were separated for a more detailed analysis which was performed by Robert A. Taylor. Ceramics were analyzed by Carol S. Spears.

Classes of historic artifacts are mostly self descriptive. Overall, very few historic materials were found during the project, and most of these were in the plowzone or upper levels of the units. The historic artifacts included round nails, colored glass and plain whiteware. Only one decorated sherd was collected. All of the historic material dates to the occupation of the nearby farmsteads. No historic features or clusters of historic artifacts were found in the project area.

ARTIFACT AND RECORDS CURATION

Artifacts and records are to be curated with the Arkansas Archeological Survey. Items placed in curation will include cultural materials, analysis forms, field notes, slides, negative, and maps. Accession Numbers assigned to the collections are:

SITE	ACCESSION NO.
3NW661	88-821
3NW662	88-822
3NW663	88-823

Chapter 5

SIGNIFICANCE TESTING AT THE EDGMON SITE (3NW661)

Carol S. Spears

INTRODUCTION

The Edgmon Site (3NW661) is situated in a long narrow flood plain of Smith Creek, a tributary of the Buffalo River. At the east end of the same landform is the historic Edgmon farm complex which was excluded from investigations under this contract. It is likely that the prehistoric component extends under the farm complex. The site is bounded by Smith Creek on its south, west, and east sides. Steep mountain slopes form the northern boundary.

The Edgmon Site was initially discovered in 1985 by Guy Weaver under a contract agreement between the National Park Service and the Tennessee Valley Authority. According to his sketch maps, six shovel tests in a total of 52 contained one artifact each. These positive tests were distributed over the entire 12 acre field. No artifacts were found in the field east and south of 3NW661. Further upstream, the headwaters of Smith Creek flow out of Edgmon Cave. In SPEARS investigations, artifacts were observed in the field east of the cave entrance. It is likely that this entire valley was utilized by prehistoric and historic people for a long period of time.

Significance testing at the Edgmon Site was conducted over a period of five days between April 20 through 24, 1988, by Carol S. Spears and Robert A. Taylor. Prior to that time the transects had been plowed and rained upon. Methods used to investigate the site include: 5 plowed transects, 6 backhoe trenches, 6 scrapes, 4 test units and site mapping (Figure 9).

A low density of lithic artifacts were distributed in an area about 100 m N-S x 200 m E-W as observed in the plowed transects. No culturally diagnostic artifacts except for one arrowpoint preform were found at this site during the investigations. The cultural material is confined to the upper disturbed plowzone level and it suggests that this area was used for very limited activities possibly at the same time the Luallen Site was occupied. Due to its low research potential, the Edgmon Site (3NW661) by itself is not considered significant or eligible for nomination to the National Register.

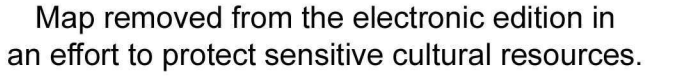


Figure 9. Map of the Edgmon Site, 3NW661.

PLOWED TRANSECTS

Five plowed transects were positioned across the site in the alignment required by the Scope of Work (Appendix E). The field, which is maintained under an agriculture lease permit, contained a dense cover of fescue which was scheduled for harvest in mid-June. Because of this lease agreement, most of the crop disturbing activities were positioned inside the plowed transects to minimize loss. Visibility in the plowed transects was excellent (95-100 %), but elsewhere in the field there was no exposed ground. The road which runs parallel to and south of the site was inspected, but no cultural material was observed.

The plowed transects were examined and all artifacts were flagged, identified and mapped by measuring distance using a 100 m tape stretched from one end of the plowed transect. The distribution of the artifacts is shown in Figure 9 and a summary of the materials collected is listed in Table 4. A complete listing of the artifacts by provenience is presented in Appendix D (Table D1).

As shown, a lower density of surface material was evident at the west end of the site except for two historic ceramic pieces found in the south end of Plowed Transect 2. One was whiteware and the other was a small polychrome painted sherd. Both of these ceramics date to the occupation of the historic farm complex located at the east end of the site and are probably the result of discard or historic dumping activities along thoroughfares.

Five low density clusters of lithic artifacts were observed in the plowed transects. All of these occurred on barely discernible rises within the fairly flat field. Additional investigations such as test units, scrapes, and backhoe trenches were accomplished within or adjacent to these clusters.

When investigations were completed at 3NW661, all units were backfilled and the plowed transect was bladed smooth to facilitate harvesting hay at a later date. After hail and a hard rain on the evening of May 7, the plowed transects were again examined. Fewer than 10 flakes and no diagnostic artifacts were observed.

Table 4. Artifacts Collected on the Surface and in the Scrapes (SC), 3NW661.

	SURFACE	SC1	SC2	SC3	SC5
ARROW PREFORM	1				
PITTED COBBLE	1				
CORES & FRAGS	1	1			
PRIMARY DECORT	3				
SECONDARY DECORT	12				
INTERIOR FLAKE	17	1	1	1	
FLAKE FRAGMENTS	16				1
PREFORM THINNING	1				
BIFACE THINNING	2				
PRESSURE FLAKE		1			
HISTORIC	5				
total	59	3	1	1	1

BACKHOE TRENCHES

Five backhoe trenches were excavated down the west side of Plowed Transect 3 in what were loosely defined as two low density clusters. Backhoe Trench 6 was placed at the east end of the site. Measurements of these trenches are listed in Table 5. No artifacts or cultural bearing sediments were found in any of the profiles (Figures 10-12). It was not possible to examine Backhoe Trench 5 because it immediately filled with ground water.

Table 5. Measurements of Backhoe Trenches, 3NW661.

BACKHOE TRENCH	LENGTH (m)	DEPTH (m)
1	5.0	1.5
2	3.5	1.3
3	2.6	1.0
4	3.2	1.0
5	4.1	2.0
6	2.0	1.4

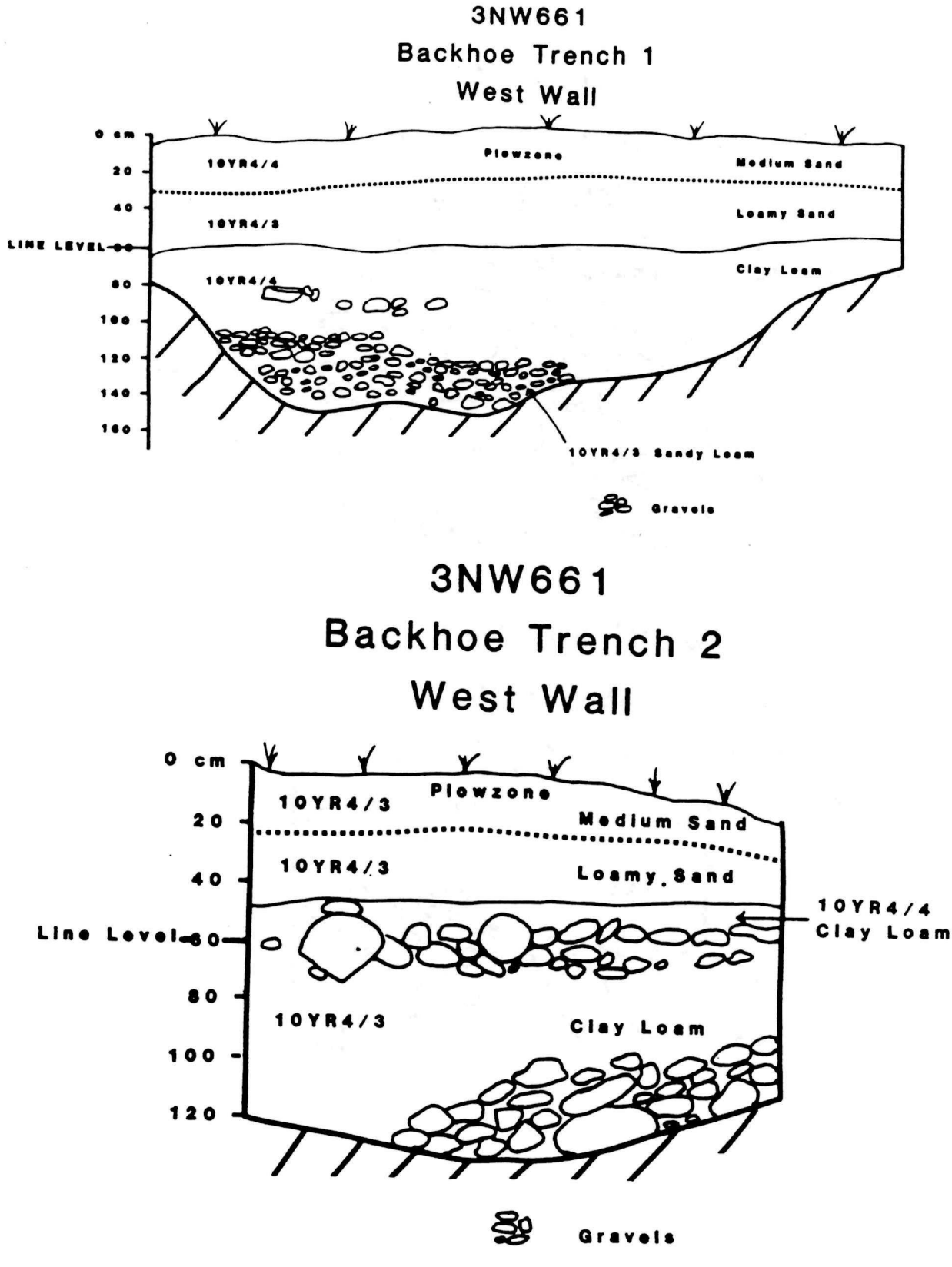


Figure 10. Profiles of Backhoe Trenches 1 and 2, 3NW661.

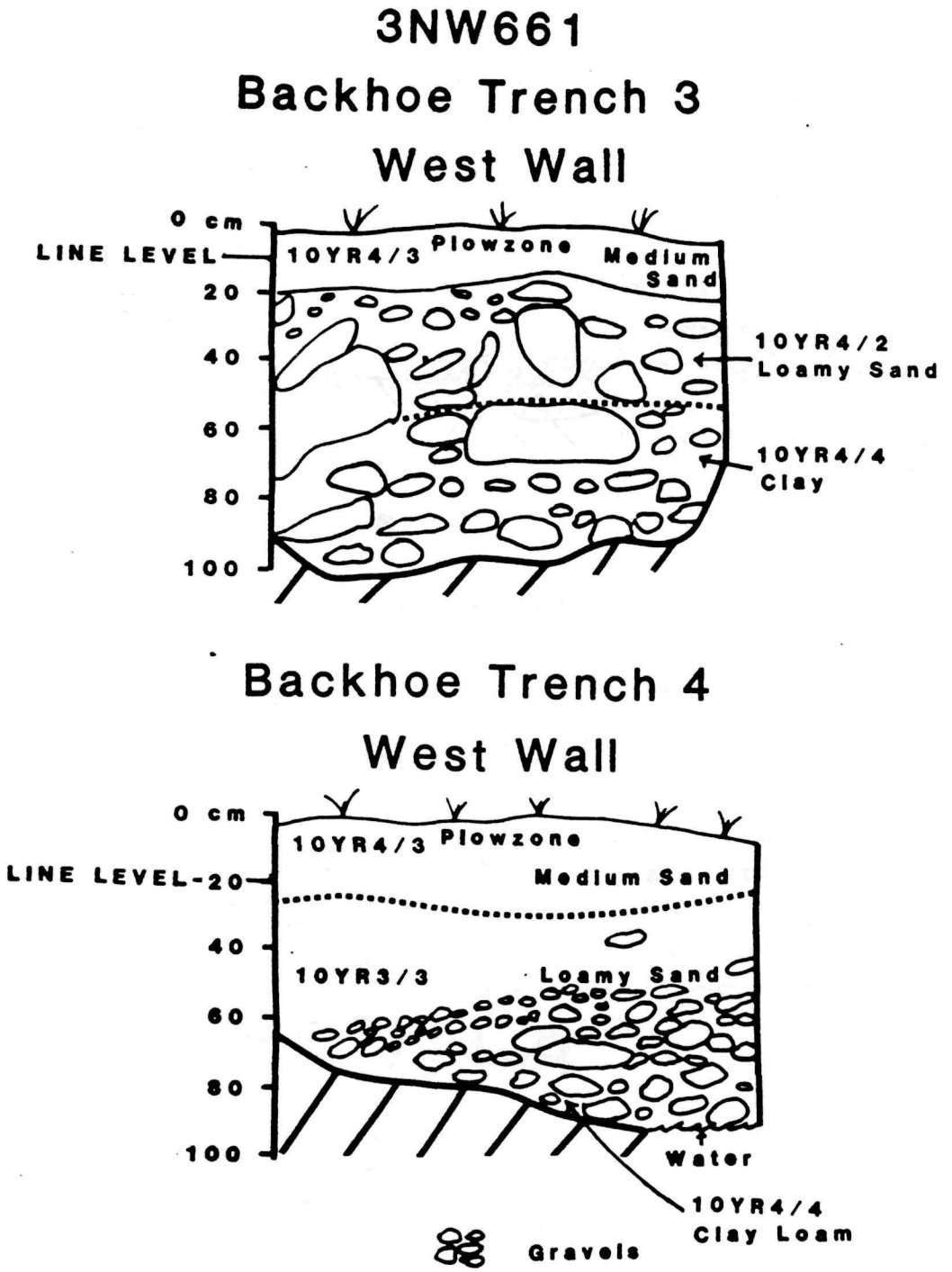


Figure 11. Profiles of Backhoe Trenches 3 and 4, 3NW661.

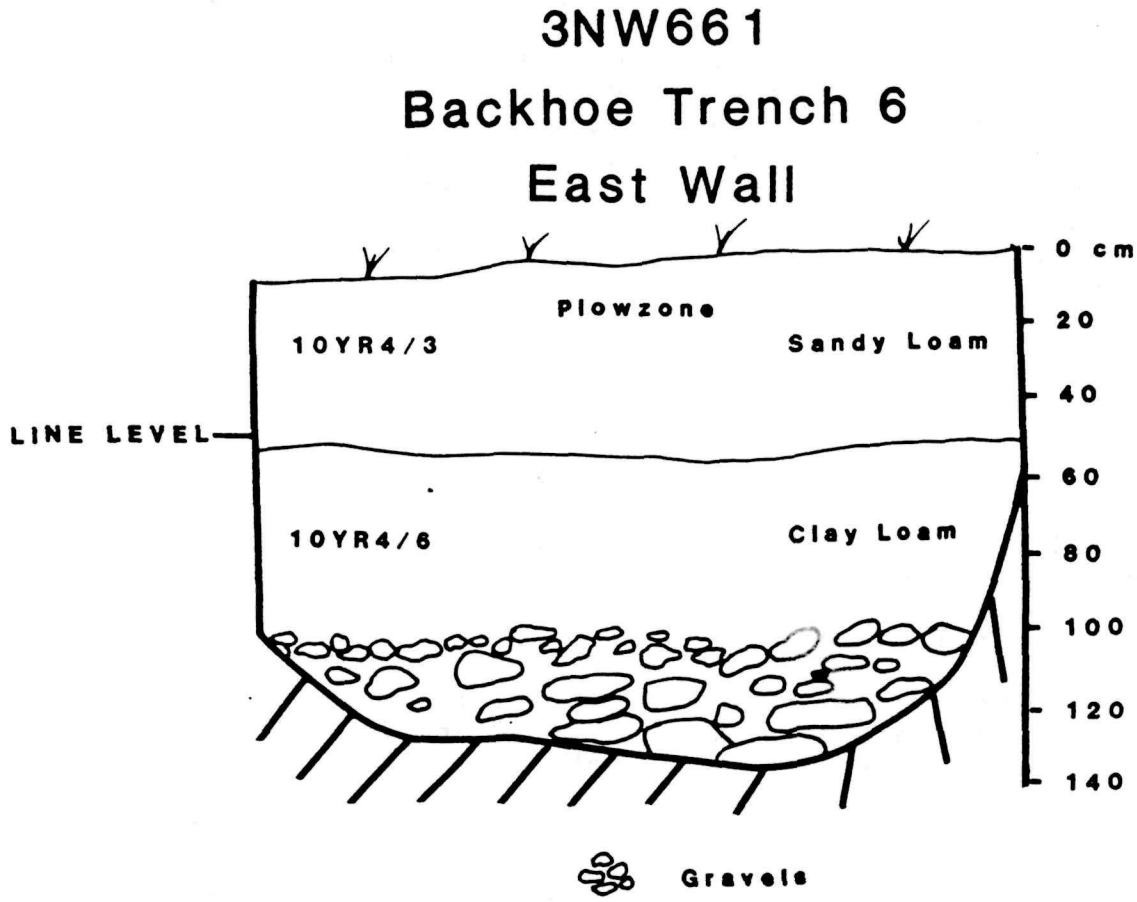


Figure 12. Profile of Backhoe Trench 6, 3NW661.

Each backhoe trench exposed sand and loam sediment overlying gravel. The sandy plowzone is 20 to 45 cm thick. This upper sand unit appears to be a recent major flood deposit. It may be equivalent to the surface sand in Backhoe Trench 6 at the Luallen Site (3NW662). Underlying the sand is a sandy loam that extends across most of the site. It is not present on the gravel bar exposed in Backhoe Trench 3. A clay loam stratum only occurs on the southeastern end of the site.

A cursory examination of SPEARS profile drawings from the Edgmon Site was accomplished by Margaret J. Guccione. The sediments suggest that the geomorphology is similar to the Luallen Site but on a smaller scale and a younger age. It is possible that Smith Creek flowed along the north wall of its valley in the past. A gravel bar (Backhoe Trenches 3 and 4) existed south of the channel and beyond that (Backhoe Trenches 1 and 2) overbank sediments derived from the paleochannel to the north were deposited. Larger floods periodically deposited lenses of gravel. This paleochannel was abandoned and the present channel developed along the south wall of the valley. This channel was the source of the sandy loam overbank deposits. Archeological material suggests that the loam deposits are younger than 500 to 1,000 years old. A recent major flood event deposited the surficial sand.

SCRAPES

All six scrapes were excavated within the plowed transects (Figure 9). The size and depth of the cleaned scraped areas are listed in Table 6. Artifacts collected in the scrapes are presented in Table 4.

Scrapes 2 and 3 each had a small round stain about 25 cm in diameter. These stains were profiled and in both cases the sediments became softer with depth and then branched out in at least two directions. Both abruptly collapsed at the water table (about 85 cm bs). Sam Huber who manages the field, told us about a tractor which was almost lost when the earth caved in on the northern part of the tract. One stain contained a portion of the root. No cultural materials were found in either anomaly. In Scrape 3, one interior flake was collected 10 cm south of the stain and 4 cm below the depth of the scrape. None of the other scrapes contained features or obvious intact cultural strata.

Table 6. Measurement of the Scrapes, 3NW661.

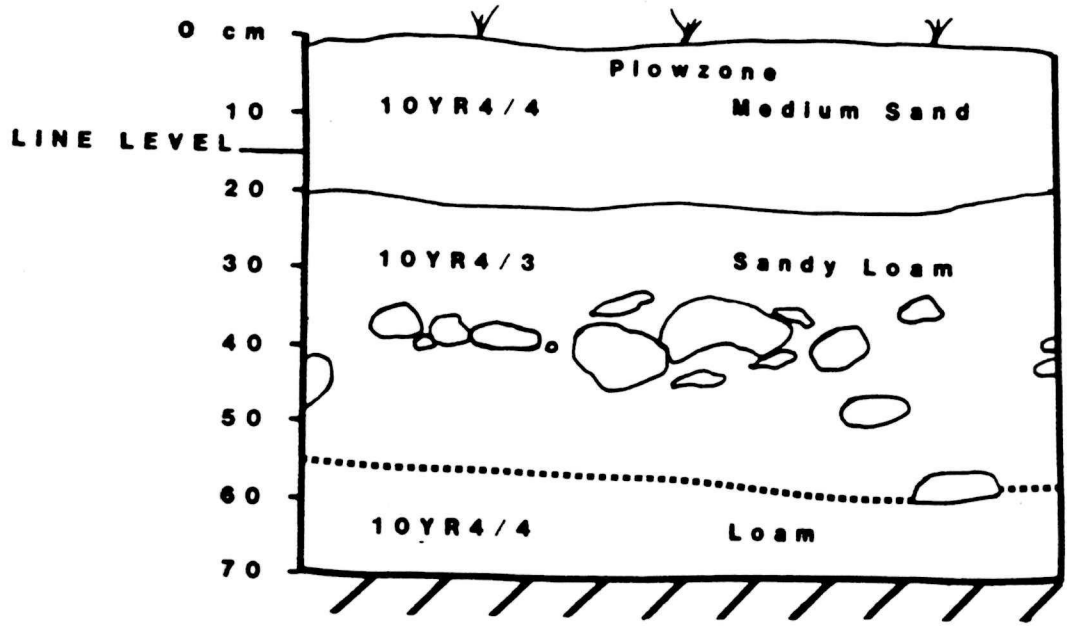
SCRAPES	LENGTH (m)	WIDTH (m)	DEPTH (cm)
1	7.0	4.0	20
2	5.0	2.5	50
3	7.5	2.1	35
4	5.0	4.0	40
5	6.0	4.0	35
6	7.0	3.5	35

TEST UNITS

Test Unit 1 was positioned east of the plowed transects on a barely discernible rise. Artifacts collected in this unit are listed in Table 7 and the East Wall Profile is shown in Figure 13. The plowzone extends to about 25 cm below datum (bd) and the top of a gravel bar occurs around 40 cm bd. The cobbles and gravels between 30-40 cm represent over 50% of the volume of the 10 cm level. The few artifacts collected below the plowzone were all small and could have been moved vertically through root action. No features, no clusters of artifacts, no charcoal, and no middens were observed. The sediments, both above and below the lens of gravel, were young and had little or no soil development. Test Unit 1 was terminated at 70 cm bd. To further examine the lens between the gravels, Backhoe Trench 6 was positioned east of Test Unit 1. Its profile differed from Test Unit 1 in that it contained older, more stable sediments. It did not contain anthropic levels.

Table 7. Artifacts Collected in Test Unit 1, 3NW661.

	0-10	10-20	20-30	30-40	50-60	TOTAL
PRIMARY DECORT		1				1
SECONDARY DECORT			1			1
INTERIOR FLAKE		1	1	1		3
FLAKE FRAGMENTS	1		1	2	1	5
PRESSURE FLAKE				1		1
LUNATE FLAKE				1		1
HISTORIC (cut nails)		2				2
total	1	4	3	5	1	14



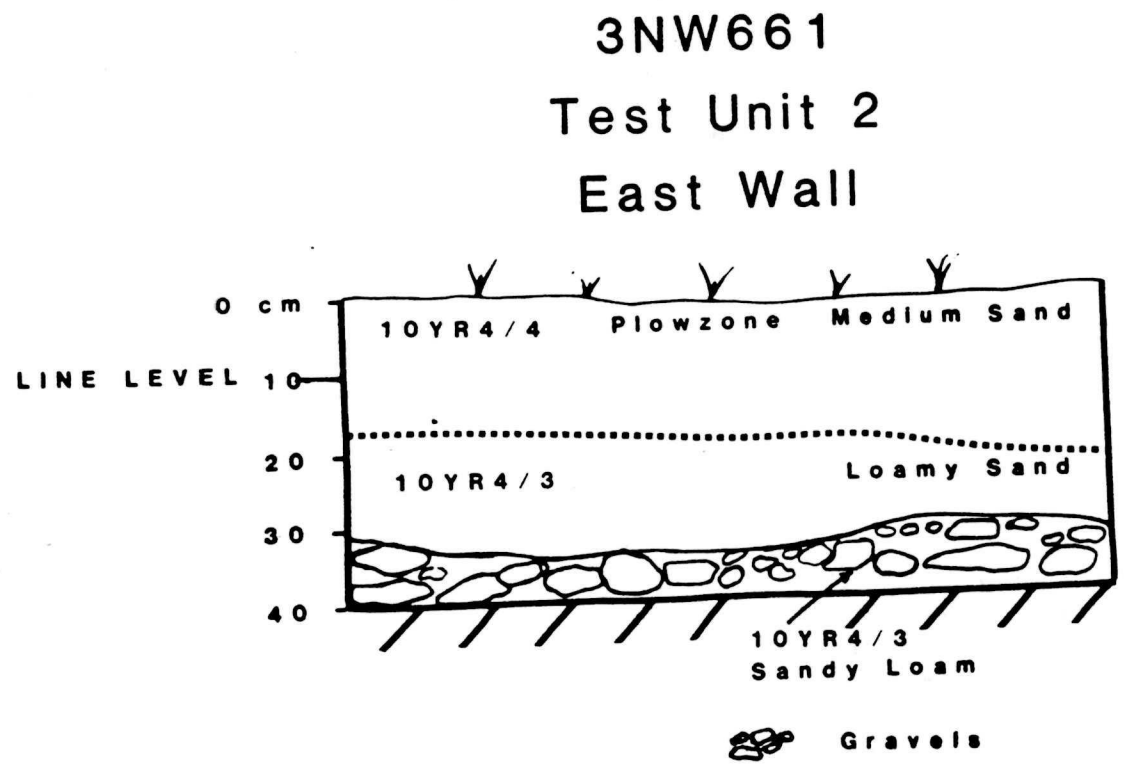


Figure 13. Profiles of Test Units 1 and 2, 3NW661.

Test Unit 2 was positioned near one of the low density surface clusters. It did not contain evidence of intact cultural deposits. As shown in Figure 13, the cobble or gravel bar occurred between 30 and 35 cm bd. The two flakes collected in the 20 to 35 cm level were both found on top of the gravel (Table 8). No feature stains or clusters of artifacts were apparent in this unit.

Table 8. Artifacts Collected in Test Unit 2, 3NW661.

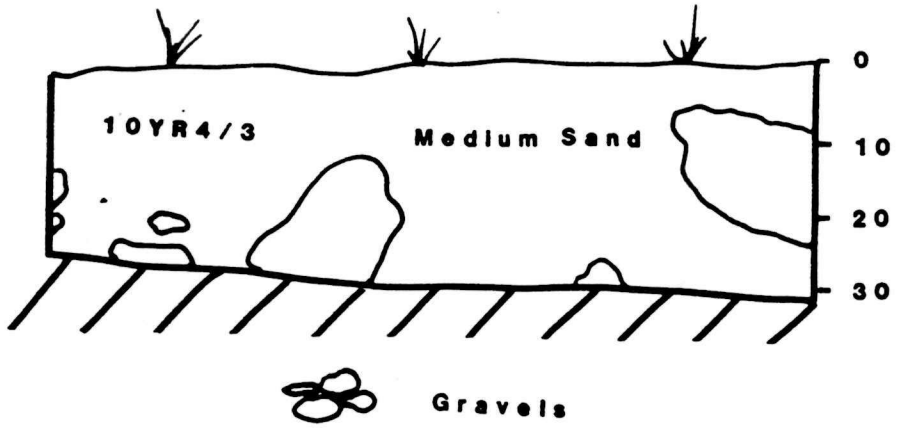
	0-10	10-20	20-35	TOTAL
BIFACE		1		1
PRIMARY DECORT			1	1
SECONDARY DECORT	1		1	2
INTERIOR FLAKE	1			1
FIRECRACKED ROCK		1		1
total	2	2	2	6

Test Unit 3 was located in the vicinity of an artifact cluster. Basal gravels were evident at 30 cm or less below the surface and the unit was terminated. A low density of material was found throughout the sediments which also contained large gravels (Table 9 and Figure 14). The entire 30 cm above the basal gravels is interpreted as plowzone.

Table 9. Artifacts Collected in Test Unit 3, 3NW661.

	0-10	10-20	20-30	TOTAL
PRIMARY DECORT			2	2
FLAKE FRAGMENTS	1	4	2	7
PREFORM THINNING		1		1
PRESSURE FLAKE	1	1		2
FIRECRACKED ROCK	1			1
HISTORIC		1		1
total	3	7	4	14

Test Unit 4 was placed on the highest portion of the site. Two plowscars trending east-west were evident at 30 cm bd. Just below 30 cm there were seven small artifacts (Table 10). The



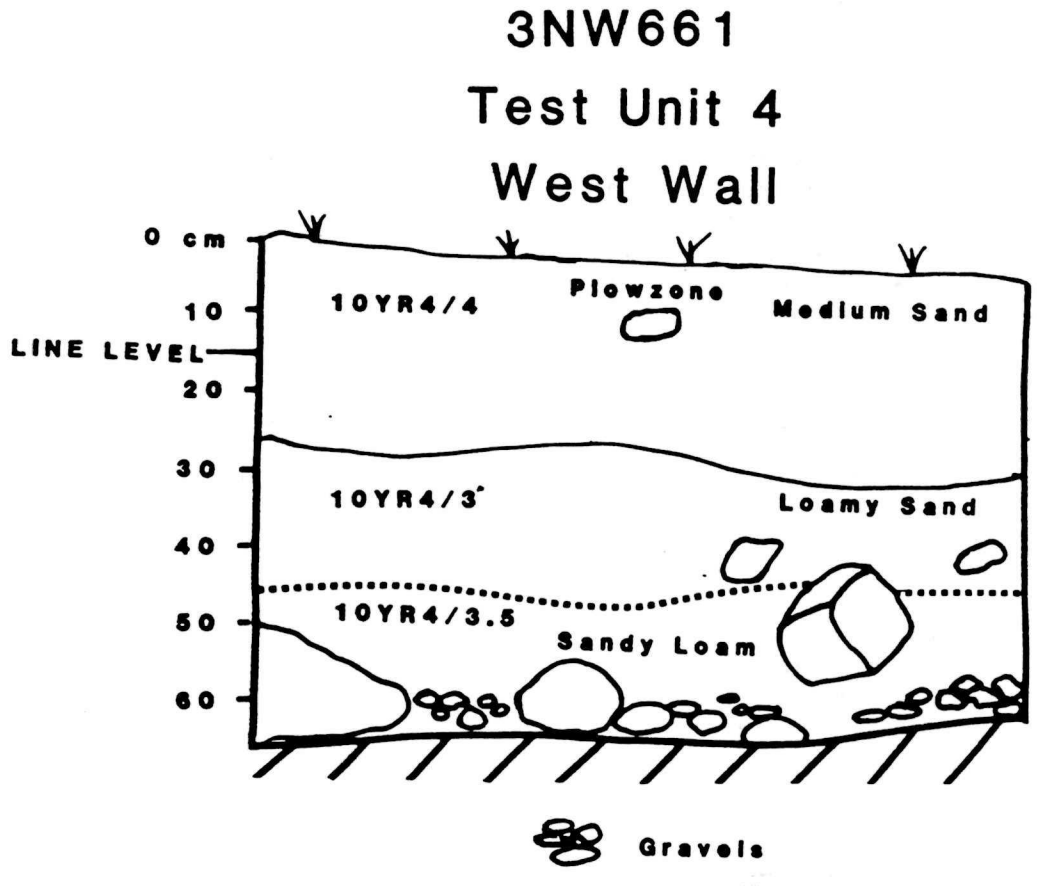


Figure 14. Profiles of Test Units 3 and 4, 3NW661.

gravels increased in frequency and size with depth (Figure 14). No cultural material was collected from 40 to 50 cm or in the western half of the level from 50 to 60 cm.

Table 10. Artifacts Collected in Test Unit 4, 3NW661.

	0-12	12-20	20-30	30-40	TOTAL
PP/K TIP				1	1
PRIMARY DECORT			1	2	3
SECONDARY DECORT		1	1		2
INTERIOR FLAKE	3	1	3	2	9
FLAKE FRAGMENTS		2	2	2	6
PRESSURE FLAKE		1			1
FIRECRACKED ROCK				2	2
UNMODIFIED STONE			1	2	3
total	3	5	8	11	27

SIGNIFICANCE

Because few open and limited activity sites have been investigated in the Ozark Mountain Region, comparisons and evaluations between resources are difficult. On the basis of subsurface testing conducted by SPEARS, this site, by itself,is not eligible for nomination to the National Register. The cultural materials are widely dispersed across the field (100 m N-S x 200 m E-W), occur in low densities (134 total artifacts collected at the site) and are primarily associated with the upper disturbed sediments (10-40 cm). No diagnostic artifacts were found and, therefore, temporal period or periods are not known. No features or obvious intact anthropic sediments were evident.

As a member of prehistoric sites in Boxley Valley, the Edgmon Site can and does contribute to our understanding of settlement patterns. The artifact assemblage indicates a limited use of this landform to manufacture tools or preforms (cores, pitted cobble, and flakes); to use and resharpen tools (bifacial thinning flakes and pressure flakes); to finish projectile points (lunate flake); and to use, break and discard tools (projectile point tip). Heat treating or fire cracked rock is most common on the surface and in the plowzone. This may represent prehistoric activity but could also be a result of historic clearing and/or agricultural practices. The only temporal indicator is the arrowpoint preform dating to the Mississippi period.

The frequencies of raw material types used at the Edgmon Site are presented in Table 11. In other areas, the frequency of Pitkin chert has been shown to be high in the Archaic period, decreases in the Woodland and becomes high again in the Mississippi period (Ray 1986). These patterns are supported by the frequency of Pitkin at the two other sites investigated during this project (see Tables 25 and 31). The frequency of Pitkin chert during the Archaic period as represented at the Sattler Site (3NW663) was 17.6 per cent. The frequency of Pitkin chert during the Woodland period as represented at the Luallen Site (3NW662) is 11.6 percent and for the Mississippi period at the same site is 19.3 per cent. The even higher frequency of Pitkin at the Edgmon Site is attributed to exposures of the raw material above the site and numerous Pitkin chert cobbles in Smith Creek. Extensive use of locally available raw materials dominates the frequencies collected in samples at sites investigated on the Buffalo River (Spears et al. 1986; Lafferty et al. 1988) and in upper Lee Creek (Trubowitz 1980).

Table 11. Frequency of Raw Material, 3NW661

BOONE		PITKIN		OTHER CH		SILT		SANDSTONE		TOTAL	
ct	%	ct	%	ct	%	ct	%	ct	%	ct	%
48	37.5	55	43.3	18	14.2	5	3.9	1	.78	127	100

The sediments at the site are shallow with gravel bars exposed just below the surface. There are indications that the field was frequently flooded by fast moving waters laden with heavy gravels. The sediments and the possible frequent floods contributed to making this a less desirable location for habitation and prehistoric horticulture/agriculture than the large flood plain of the Buffalo River located to the west at the Luallen Site (3NW662). There is a low potential for deeply buried deposits at the Edgmon Site. Due to its limited prehistoric use, there is little potential for intact features. The field should continue to be managed in such a manner to reflect the overall pastoral setting which characterizes Boxley Valley.

Chapter 6

EVIDENCE OF MISSISSIPPIAN UTILIZATION AND EXTENSIVE WOODLAND OCCUPATION AT THE LUALLEN SITE (3NW662)

Carol S. Spears

INTRODUCTION

The Luallen Site (3NW662) is located on a wide flood plain of the Buffalo River south of its confluence with Smith Creek. The Buffalo River upstream from this 60 acre field is deeply entrenched and has little to no flood plain. Perennial springs flow out from the base of steep mountain slopes along the eastern margin of the field.

The site was recorded in 1985 during an archeological survey conducted by Guy Weaver under a cooperative agreement between the National Park Service and the Tennessee Valley Authority. The report of this project is not available; however, field maps of shovel tests conducted at 30 m intervals over the entire Luallen tract were examined. The locations of the positive shovel tests indicated low densities of artifacts over much of the landform with higher densities toward the center of the tract and in the northeast and northwest corners.

Significance testing was conducted by SPEARS over a period of 12 days between May 15 and June 15, 1988. The majority of the fieldwork was performed by Carol S. Spears and Robert A. Taylor who were assisted by Mary E. Pyles during site mapping; Mary E. Pyles and one local volunteer during surface collecting; and Deborah R. Wilcox, Michael G. Langford, and Debbie Wingert during the excavation of the test units. Methods used to test the site included: 19 plowed transects (designated by letters A through S), 3 controlled surface collections (3 m x 3 m), 13 backhoe trenches, 9 scrapes, 6 test units (1 m x 1 m), and site mapping. The locations of these units are shown in Figure 15. The fields are managed under an agriculture use permit. To limit disturbances to the crop, the scrapes were confined to the plowed transects.

The testing program resulted in the identification of several areas of deep intact middens which were exposed in the plowed transects and buried by more recent relatively sterile alluvium. The cultural middens were about 40 cm in thickness. Beneath the middens are earlier intact anthropic sediments. Features including post molds and pits were identified. The upper portion of the deposits contain evidence of a Mississippi occupation which

Map removed from the electronic edition in
an effort to protect sensitive cultural resources.

Figure 15. Map of the Luallen Site, 3NW662.

has intruded a more intense Woodland occupation. The deepest deposits are believed to date to the Archaic, although no temporally diagnostic artifacts were collected in the lower levels of the units excavated. Artifacts were observed eroding out of the bank into the Buffalo River and in spring drainages. Site boundaries are extended to include the southernmost field and the historic farmstead which were excluded from this contract. The entire site contains intact strata and features. It is definitely important to our understanding of the prehistory of the region. The Luallen Site (3NW662) is highly significant and eligible for nomination to the National Register.

PLOWED TRANSECTS

The 19 plowed transects were positioned in the field according to requirements in the Scope of Work (Appendix E). These transects were 14,337.97 linear feet or 2.7 miles long. A disk could not effectively cut through the thick pasture grasses, therefore, a breaking plow was used to obtain the desired 100% surface visibility. After sufficient precipitation, it was evident that the plow had exposed areas containing dark, organic middens with high artifact densities. The scope of work did not specify controlled surface collections. However, because it was in the best interests of the site to collect the artifacts for scientific research and as a deterrent to nonscientific collecting on federal land, SPEARS notified National Park Service of this situation. We requested that controlled collections of the exposed middens be made. No action to remedy this situation was taken by the park. SPEARS attempted to maintain a presence on the site during the testing project and asked local collectors to refrain from picking up materials while our work was in progress. However, footprints, disappearing preforms, collector's discard piles, and local rumors about arrowpoints collected were evident.

To better define the high density of cultural material on the surface, samples of the plowed transects were examined more closely. All artifacts were flagged, analyzed, and counted in Plowed Transects A, B, C, D and the northern end of Plowed Transect E. Lists of the artifacts observed by provenience are presented in Appendix D (Table D2). Total counts for artifacts in Plowed Transects B, C, and D are shown in Figure 16. Three controlled surface collections were conducted in the areas with high densities (Table 12).

Transect A

In Plowed Transect A, which was 160 m long, 297 artifacts were observed. Densities ranged from 0-19 artifacts per 3 m x 3 m unit with a mean (or average) of 6 artifacts per unit. In this sample 3.5 per cent were tools or cores and the remainder were flakes. The following diagnostic artifacts or tools were collected: 1 serrated arrowpoint fragment (FSN 24), 1 projectile point fragment, 2 hammerstones, 2 preforms, 1 biface, 1 core, and 2 cores/tested cobbles.

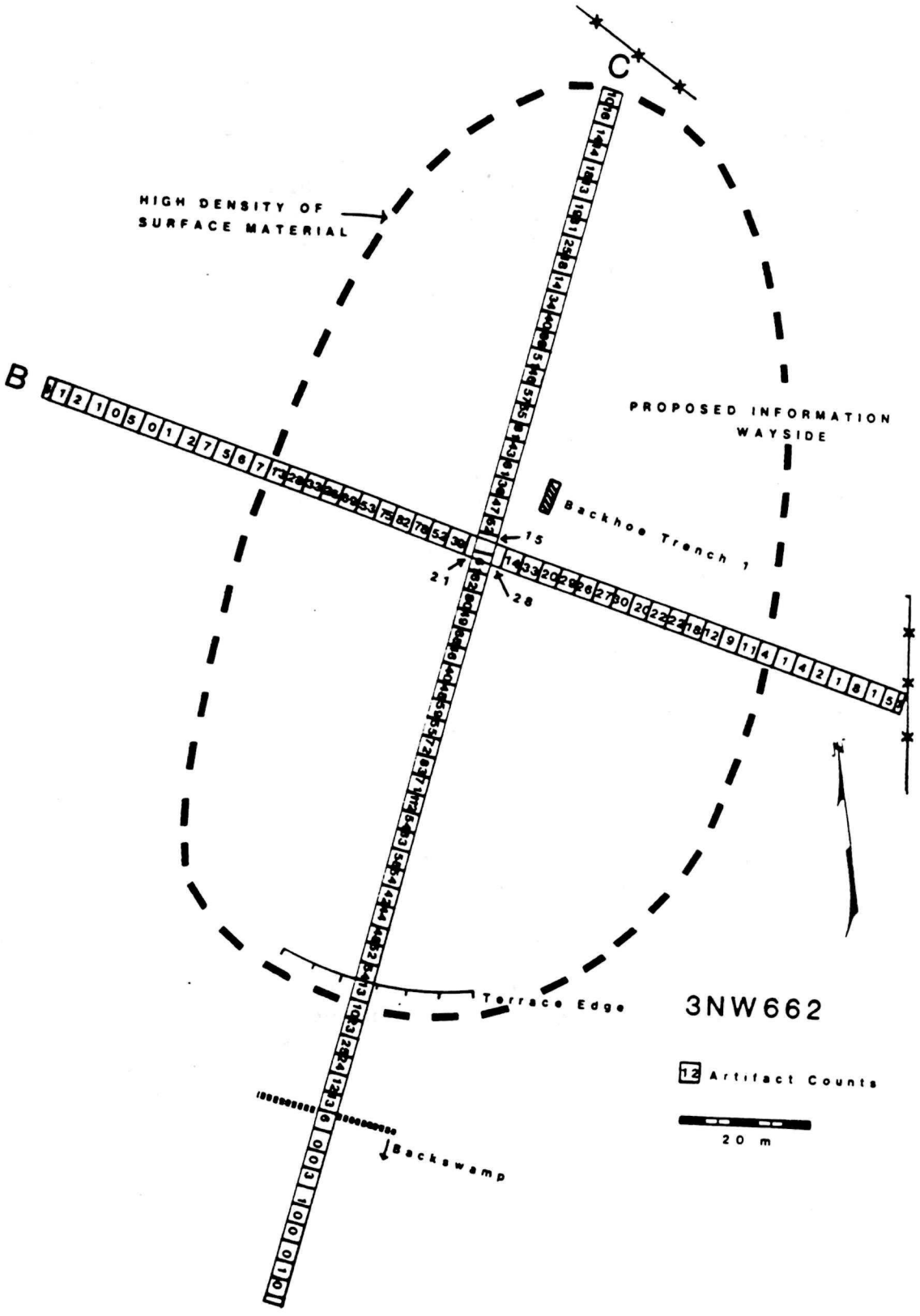


Figure 16. Total Count of Artifacts in Plowed Transects B and C, 3NW662.

Transects B and C

Transect B is 140 m long and a total of 1,582 artifacts were observed on the surface with densities ranging from 1-85 specimens per 3 m x 3 m unit. Transect C was 204 m long and 2,401 artifacts were observed with densities ranging from 0-112 in each 3 m x 3 m unit. The mean or average number of artifacts per unit in these two transects is 36. In this sample about 3.3 per cent of the total number of artifacts are tools or cores and the remainder are flakes. Diagnostic artifacts or tools observed (and in some cases collected) in these plowed transects were: 6 arrowpoints or fragments (1 untyped cornernotched FSN 18-1, Figure 35c), 1 shell tempered sherd, 20 projectile points or fragments, 1 drill, 1 hoe (FSN 10-1, Figure 41a), 1 chipped ax, 2 hammerstones, 2 pitted cobbles, 5 bifaces, 33 preforms, 14 tested cobbles/cores, 42 cores, and 1 core/chopper.

The arrowpoints included one untyped cornernotched (FSN 18-1, Figure 35c), one Rockwall (FSN 9-1, Figure 35b) and one Shetley (FSN 3-3. Figure 35a). Thirteen whole projectile points were found:

2 untyped corner/basal notched (FSN 3-1, Figure 38b; FSN 22-1, Figure 40e)
4 untyped corner notched (FSN 17-1, Figure 40c; FSN 21-1, Figure 40d; FSN 3-2, Figure 40a; FSN 16-1, Figure 38d)
4 untyped straight to slightly expanded stem (FSN 4-1, Figure 40b; FSN 6-1, Figure 38c; FSN 20-1, Figure 39c; FSN 130-1, Figure 38g)
1 expanded stem (FSN 8-1, Figure 39b)
1 straight stem base (FSN 23-1, Figure 40f)
1 notched preform (FSN 129, Figure 40j).

Plowed Transect D

In Plowed Transect D, a low density of cultural material was evident and only 22 artifacts were observed in the 53 m long transect. Each 3 m x 3 m had from 1-6 artifacts, averaging 1.3 items per unit.

Plowed Transect E

In Plowed Transect E, a portion 79 m long at the north end of the transect was examined. A total of 325 artifacts were observed with densities ranging from 0-48. A total of 55 artifacts were collected in a controlled collection unit from 65-68 m. An average of 12.5 artifacts were observed per 3m x 3m unit. Of these, 5.9 per cent are tools or cores and the reminder are flakes.

The diagnostic artifacts or tools observed include: 1 arrowpoint preform (FSN 27-1, Figure 34a), 1 projectile point tip, 1 flaked scraper, 1 hoe, 1 tested cobble/fore, 2 bifaces, 3 preforms, and 8 cores. One bird bone was also found in the vicinity of Scrape 1 where three prehistoric pits were document-

ed. Further south on Plowed Transect E and just north of the field road was 1 Nodena-like arrowpoint (FSN 40-1, Figure 34e).

Plowed Transects E-S

The remainder of the transects were inspected on several occasions and only diagnostic artifacts were collected and mapped with a transit and tape (Figure 15). Notes were also taken on whether a high, medium, or low density of artifacts were evident in the transect (Figure 15). These ranges were not defined by ranges of artifacts, but were judgments based on rough comparisons of densities in areas where artifacts were counted.

Diagnostic lithics mapped in these transects include:

TRANSECT	ITEM	FSN	FIGURE NO.
J	1 Gary Projectile point	41-1	37c
K	1 Gary	38-1	37f
	1 Reed arrowpoint	29-1	34b
	1 untyped straight stem to slightly expanding stem	28-1	39d
L&O	1 Sequoyah arrowpoint	68-1	35f
	1 Gary Projectile Point	46-1	37d
L&N	1 Nodena arrowpoint	75-1	34g
	1 preform	43-1	41c
M	1 Rockwall arrowpoint	44-1	35d
N	1 untyped corner/basal notched projectile point	42-1	38e
O	1 Reed arrowpoint	31-1	34c
	2 Gary projectile points	32-1	36b
		30-1	37e
P	1 siltstone hoe	34-1,	41b
Q	1 shallow side notched arrowpoint	79-1	35e
	1 untyped arrowpoint	37-1	34d
	1 untyped straight to slightly expanded stem projectile point	36-1	40g.

Spring branch

A high density of material was observed and collected during examination of the dry spring branch. The origin of this material was not readily apparent. The artifacts collected are listed in Table 12. The six projectile points include:

ITEM	FSN	FIGURE NO.
3 Gary projectile points	1-1	36a
	1-2	37a
	1-3	37b
2 untyped corner notched projectile points	1-4	38a
	1-5	39a
1 untyped base		

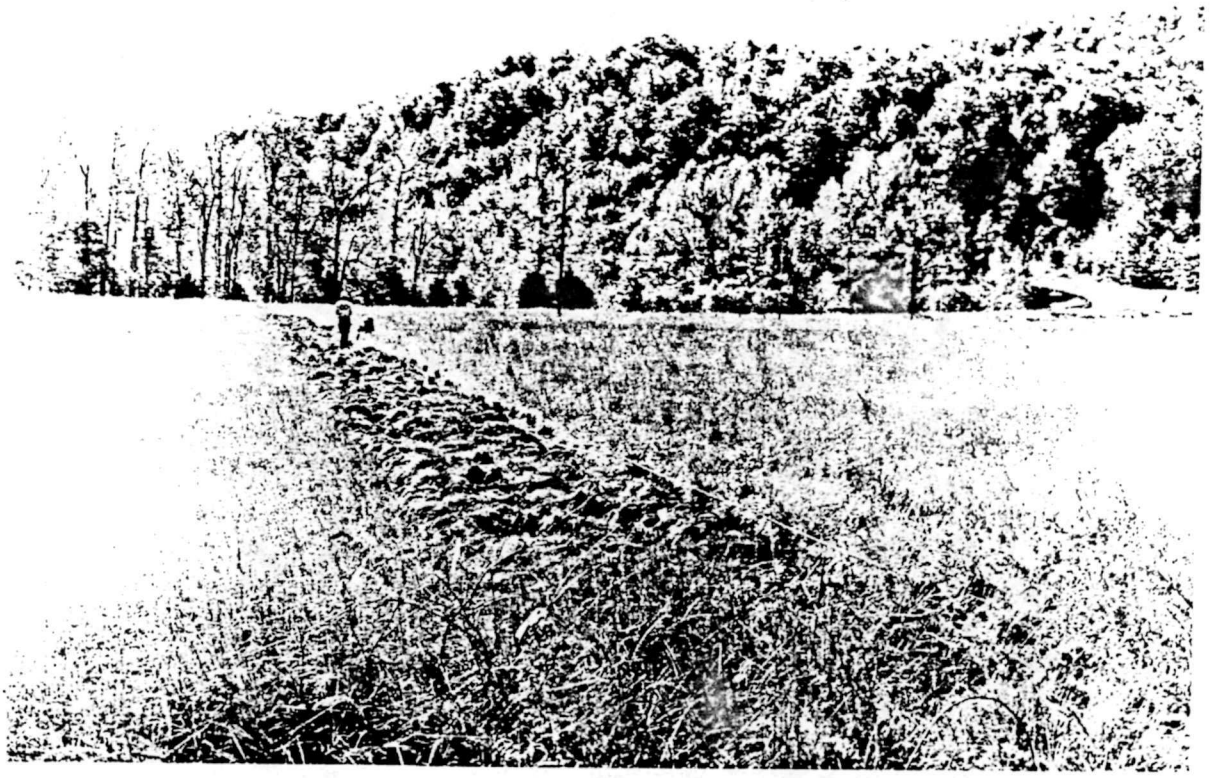


Figure 17. High Density of Artifacts in Plowed Transect B, 3NW662.



Figure 18. Profile of Midden in Backhoe Trench 1, 3NW662.

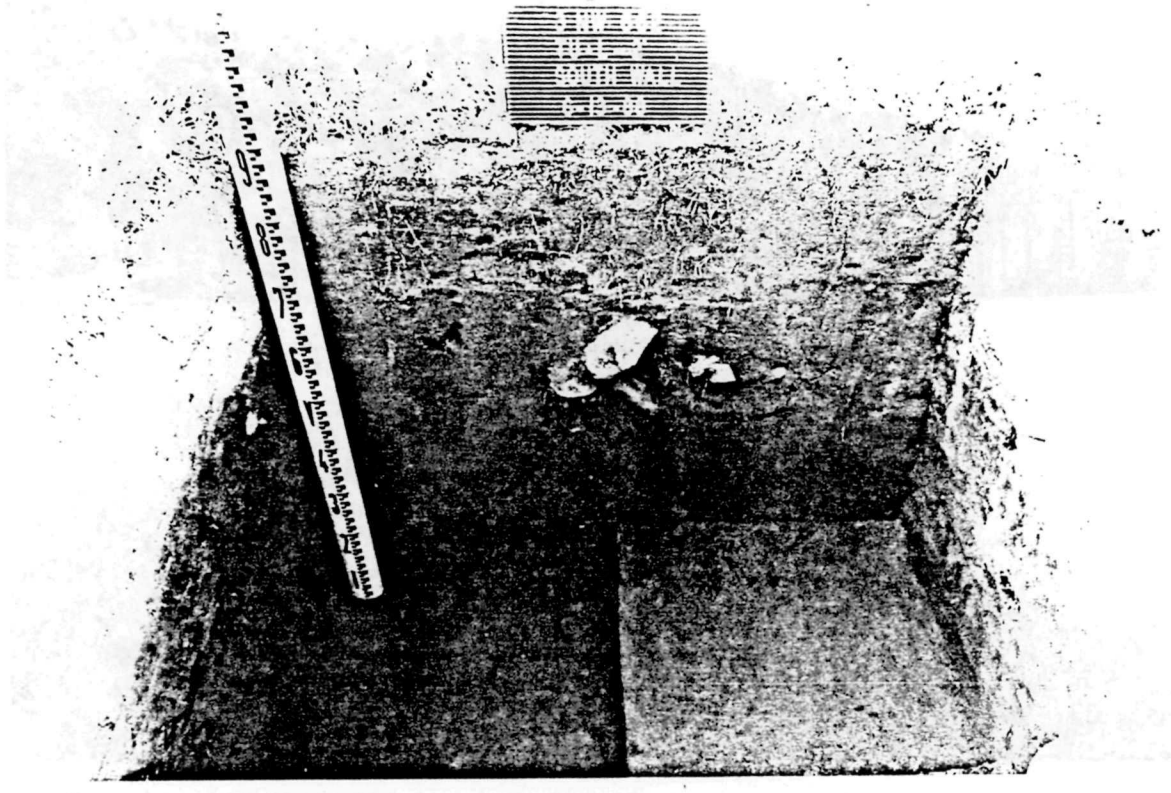


Figure 19. Cultural Strata in South Wall Profile of Test Unit 2, 3NW662.



Figure 20. Midden and Burned Rock in South Wall Profile of Test Unit 6, 3NW662.

Table 12. Artifacts Collected in Controlled Surface Collections, and Spring Branch, 3NW662.

Abbreviations Used:PP=PROJECTILE POINT/KNIFE; AP=ARROWPOINT; B=BIFACE; P=PREFORM; PC=PITTED COBBLE; UF=UTILIZED FLAKE; C=CORE; PFL=PRIMARY DECORTICATION FLAKE; SFL=SECONDARY DECORTICATION FLAKE; IFL=INTERIOR FLAKE; FF=FLAKE FRAGMENT; PT=PREFORM THINNING, BT=BIFACIAL THINNING; PF=PRESSURE FLAKE; L=LUNATE FLAKE; FCR=FIRE CRACKED ROCK; UM=UNMODIFIED ROCK; O=OTHER.

LOCATION	PP	AP	P	PC	UF	C	PFL	SFL	IFL	FF	PT	BT	PF	FCR	UM	O	TOTAL
PTB 49-52	2	1	4	1		1		2	21	36			2	7	2		79
PTC 101-104						3		2	8	15	1	2	2	3	4		40
PTE 65-68	1			1	2	6	3	5	15	11			1	3	7		55
SPRBRANCH	6		8				2	10	35	16	2	2		1	1	2	85

Table 13. Summary of Diagnostic and Selected Artifacts Mapped within the Plowed Transects, 3NW662.

ARCHAIC ARTIFACTS		MISSISSIPPI ARTIFACTS	
Basal Notched PP/K	1	Arrowpoints	14
Chipped Ax	1	Shell Tempered Ceramics	4
WOODLAND ARTIFACTS			
Corner Notched PP/K	8	SELECTED TOOLS	
Contracting Stemmed PP/K	6	Perforator/Drill	1
Expanding Stemmed PP/K	2	Preforms	6
Stemmed PP/K	1	Hammerstone	1
Chopper	1	Core	1
Hoes	2	Hoe/Chopper	2

Although much information could have been collected had the entire transects been subjected to controlled collections, the surface deposits were not positively correlated with subsurface deposits. Subsurface tests located in low density areas contained buried intact middens. The high density of surface material was due not only to intense occupation but also to disturbance by agricultural practices of the upper portions of middens.

The diagnostic artifacts included items dating primarily to the Mississippi and Woodland periods. One Archaic projectile point was found in the south end of Plowed Transect N, but in general no temporally distinct areas were observed in the distribution of surface material.

BACKHOE TRENCHES

A total of 13 backhoe trenches were excavated at the site. Their locations are shown in Figure 15. Sizes and depth are presented in Table 14. Five of these backhoe trenches were sampled by Dr. Margaret J. Guccione (Chapter 2).

The Buffalo River is actively undercutting the flood plain in several locations. These cut banks were examined and cultural material was observed in two locations at the north and south end of the Luallen tract. These locations are discussed after the Backhoe Trenches.

Residents of the area and local collectors informed us that a prehistoric burial had been exposed when high water cut through one of the old channels in the early 1940s. The burial and ceramics were not removed. At the same time a herd of cows died in an epidemic and were buried in the same area. Several persons knowledgeable of this event visited the site and showed where they thought the event occurred. Backhoe trenches were excavated in several swales in an attempt to find the evidence of these events. None were successful. However, given the intense occupation of the area prehistorically, there is a high potential for prehistoric human burials in the tract.

Table 14. Measurements of the Backhoe Trenches, 3NW662.

BACKHOE TRENCH	LENGTH (m)	DEPTH (m)
1	5.5	2.0
2	5.5	1.4
3	5.0	2.0
4	5.5	1.3
5	4.5	3.0
6	5.5	2.0
7	2.0	1.0
8	4.0	2.0
9	3.0	1.0
10	3.0	1.0
11	4.5	1.3
12	5.5	1.4
13	3.0	1.0

Backhoe Trench 1: Midden and Buried Cultural Strata

Backhoe Trench 1 was positioned on top of a low rise and it contained 35 cm of intact, dark, highly organic midden just beneath the plowzone (Figures 15 and 21). This cultural stratum has a high density of lithic artifacts in addition to charcoal and well preserved deer bone. It dates to the Mississippi and Woodland periods. Underneath the midden beginning at 60 cm is an earlier cultural stratum which contains lithic artifacts (Table 15). This sediment has remained stable for a long time and has undergone weathering processes as evident by its color, texture, and root casts staining. Beginning at about one meter below the surface is a third cultural stratum which ends on top of the basal gravels, 1.6 m below the surface. The deepest artifact in the profile is an interior flake composed of Boone chert collected at 1.4 m bs. Due to the lack of diagnostic artifacts, the temporal affiliations of these lower strata are not known.

Table 15. Artifacts Collected in Backhoe Trenches and River Cutbank, 3NW662.

Abbreviations Used:P=PROJECTILE POINT/KNIFE; AP=ARROWPOINT; PF=PREFORM; HAMMER=HAMMERSTONE; C=CORE; UTIL FLK=UTILIZED FLAKE; INT FLK=INTERIOR FLAKE; FLK FRAG=FLAKE FRAGMENT; PREF TFLK=PREFORM THINNING FLAKE; BIF TFLK=BIFACIAL THINNING FLAKE; PRESS FLK=PRESSURE FLAKE; FCR=FIRE CRACKED ROCK; UN ST=UNMODIFIED ROCK; B=BONE; S=SHELL; N=NUTSHELL; CH=CHARCOAL.

Backhoe Trench 1

LOCATION	PREFORM	HAMMER	UTIL FLK	C	INT FLK	FLK FRAG	PREF TFLK	BIF TFLK	PRESS FLK	FCR	UN ST	B	TOTAL
backdrt	1	1	1	1	5	11	1	1	2	1	1		25
mapped					1	1	1					1	4

Backhoe Trench 2

LOCATION	PREFORM	UTILIZED FLAKE	NUTSHELLS	TOTAL
backdrt		2		2
mapped	1		X	1

Backhoe Trench 3

LOCATION	PRIMARY FLAKE	FLAKE FRAGMENT	TOTAL
backdrt	1	1	2

Backhoe Trench 4

LOCAT	AP	P	PF	C	SEC FLK	UTIL FLAK	INT FLK	FLK FRAG	PREF TFLK	BIF TFLK	FCR	UN ST	B	S	N	CH	TOTAL
backdrt	1		6	1	10		27	22	7	5	7	4	15		3		108
midden		1					6	4	3	1	1		3	2	X	X	21
below midden							1	1									2

Backhoe Trench 6

LOCATION	INTERIOR FLAKE	SHELL TEMPERED SHERD	TOTAL
midden	1	1	2
below midden	1		1

Backhoe Trench 12

LOCATION	PREFORM	FLAKE FRAGMENT	TOTAL
backdrt	2	1	3

River Cut Bank

LOCATION	PREFORM	TOTAL
	2	2

Backhoe Trench 2: Redeposited? Artifacts

Backhoe Trench 2 was positioned at the top eastern slope of a terrace above a swale (Figure 15). Its profile consisted of alternating lenses of sand and gravel on top of basal gravels. Cultural material was noted in the plowzone and in a compact sand at about 54 cm below the surface beneath a 20 cm thick band of gravel (Figure 22). Additional artifacts were observed in a loose homogeneous sand lens from 60-120 cm below the surface. It is not known if these artifacts were redeposited in the channel sands or if they are intact.

Backhoe Trench 3: Cultural Stratum

Backhoe Trench 3 was located on the western slope of a terrace above and on the opposite side a swale (Figure 15). Cultural material occurs in the plowzone and two artifacts were collected from the backdirt. Two flakes, one Pitkin and one Boone chert, were found in the profile at 50 and 60 cm bs (Figure 23). This intact cultural stratum occurs at 25 cm bs and extends to 70 cm where there is an increase in clay content.

Backhoe Trench 4: Woodland Midden Intruded by Mississippi Occupation

Backhoe Trench 4 was placed on a low rise within the midden exposed in the Plowed Transects J and K (Figure 15). One untyped corner notched arrowpoint (FSN 56-1,Figure 34f) was collected in the backdirt. Below the artifact bearing plowzone is a deep intact cultural midden (Figure 24). It is 40 cm in thickness and contains a high density of lithics, burned sandstone, well preserved animal bone, and charcoal (Table 15). One Gary projectile point (FSN 47-1, Figure 36c) and a deer mandible with three teeth (FSN 59-1) were collected from the south wall at about 65 cm below the surface. The midden contains artifacts primarily dating to the Woodland period but an intrusive Mississippi occupation is also evident. The lower boundary of the midden is irregular. Features such as pits and post molds could not be positively identified. Two flakes were found below the midden in

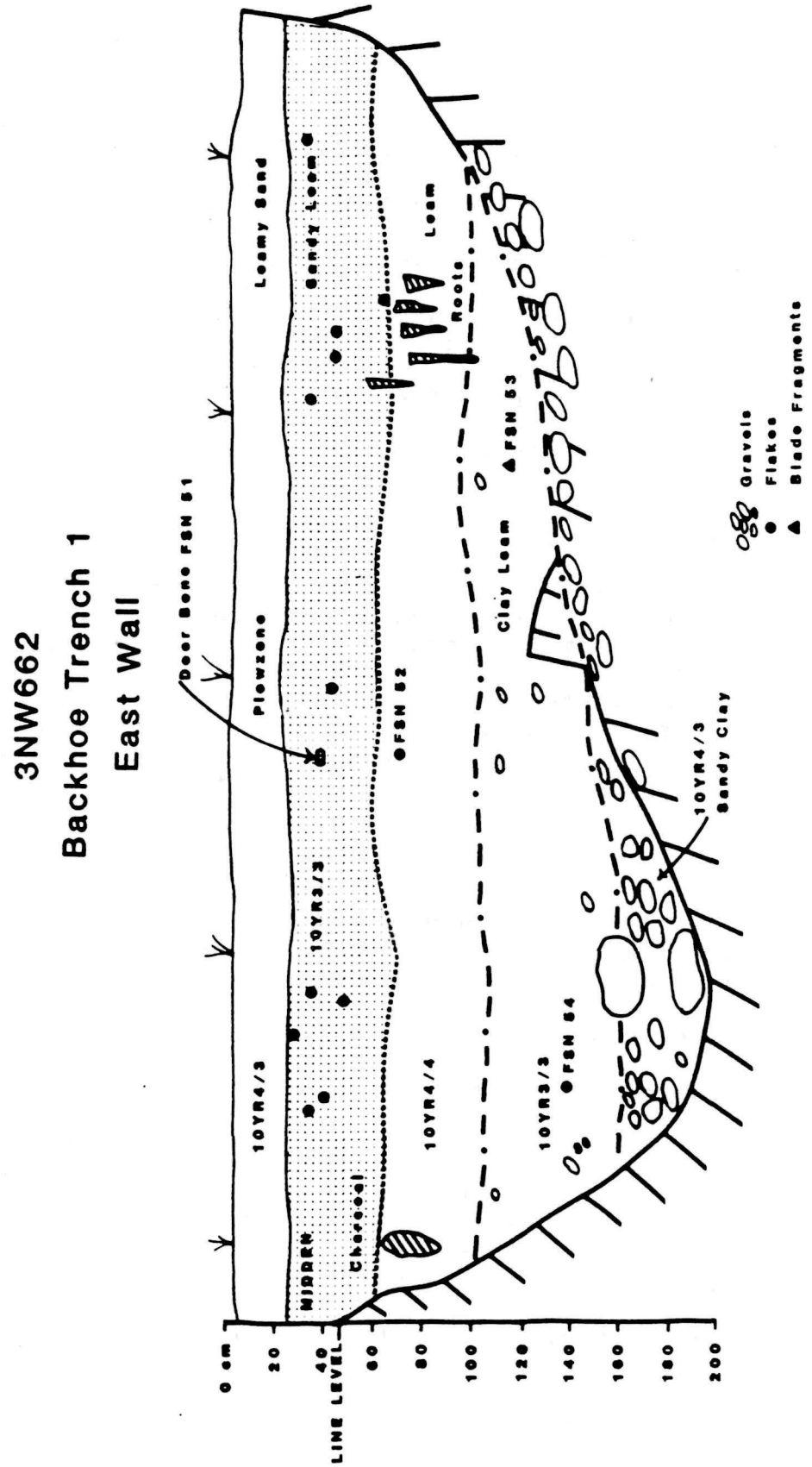


Figure 21. Profile of Backhoe Trench 1, 3NW662.

what may be an anthropic stratum. In Test Unit 6, which was positioned next to Backhoe Trench 4, artifacts found beneath the midden were associated with natural disturbances. However, more deeply buried cultural deposits may remain.

Backhoe Trench 5: Natural Strata

Backhoe Trench 5 was positioned in a low area adjacent to the spring drainage. Below the plowzone, sediments were black and highly organic, but no artifacts were observed in the profile or the backdirt. The texture analyses indicated a chute channel sand naturally high in organic matter in this location. This trench was almost 3 m deep and very unstable. Due to dangerous cave ins, it was not intensely examined.

Backhoe Trench 6: Mississippi Midden

Backhoe Trench 6 was positioned on the highest portion of a low north-south trending terrace. Below the plowzone, which was about 35 cm in depth, was a dark, almost black cultural midden (Figure 23). It extended to 75 cm below the surface. Charcoal, one shell tempered sherd (a flat and square base, FSN 80-2), and a high density of lithics were observed. Sediments in this trench were unstable and the entire profile was not closely examined. One flake was collected below the midden in an anthropic stratum.

Backhoe Trench 7: Natural Strata

Backhoe Trench 7 (Figure 23) was positioned in the base of the swale between Backhoe Trenches 3 and 4. Sediments consisted of a plowzone and a dark brown loam to 50 cm, the top of the basal gravels. No cultural material was found in association with this trench.

Backhoe Trench 8: Gravels

Backhoe Trench 8 (Figure 23) was positioned on the top of the terrace adjacent to the Buffalo River. Its profile consisted of thick gravel layers separated by a 25 cm lens of sand. No cultural material was observed in this profile or in the backdirt, however, this trench was deep and unstable and close examination was not possible.

Backhoe Trench 9: Natural Strata

Backhoe Trench 9 (Figure 23) was positioned in a swale. It collapsed primarily due to heavy precipitation. No artifacts were observed in the profile or in the backdirt.

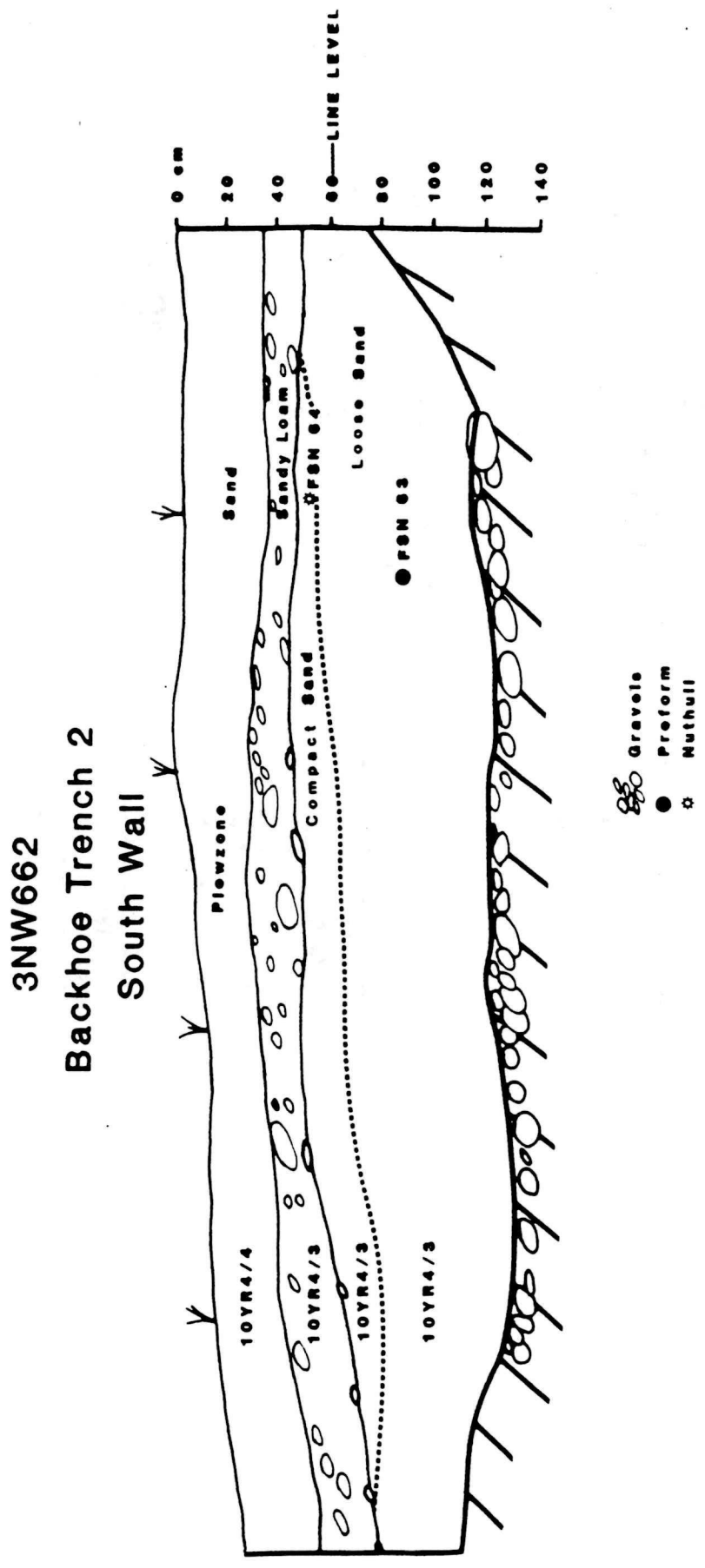


Figure 22. Profile of Backhoe Trench 2, 3NW662.

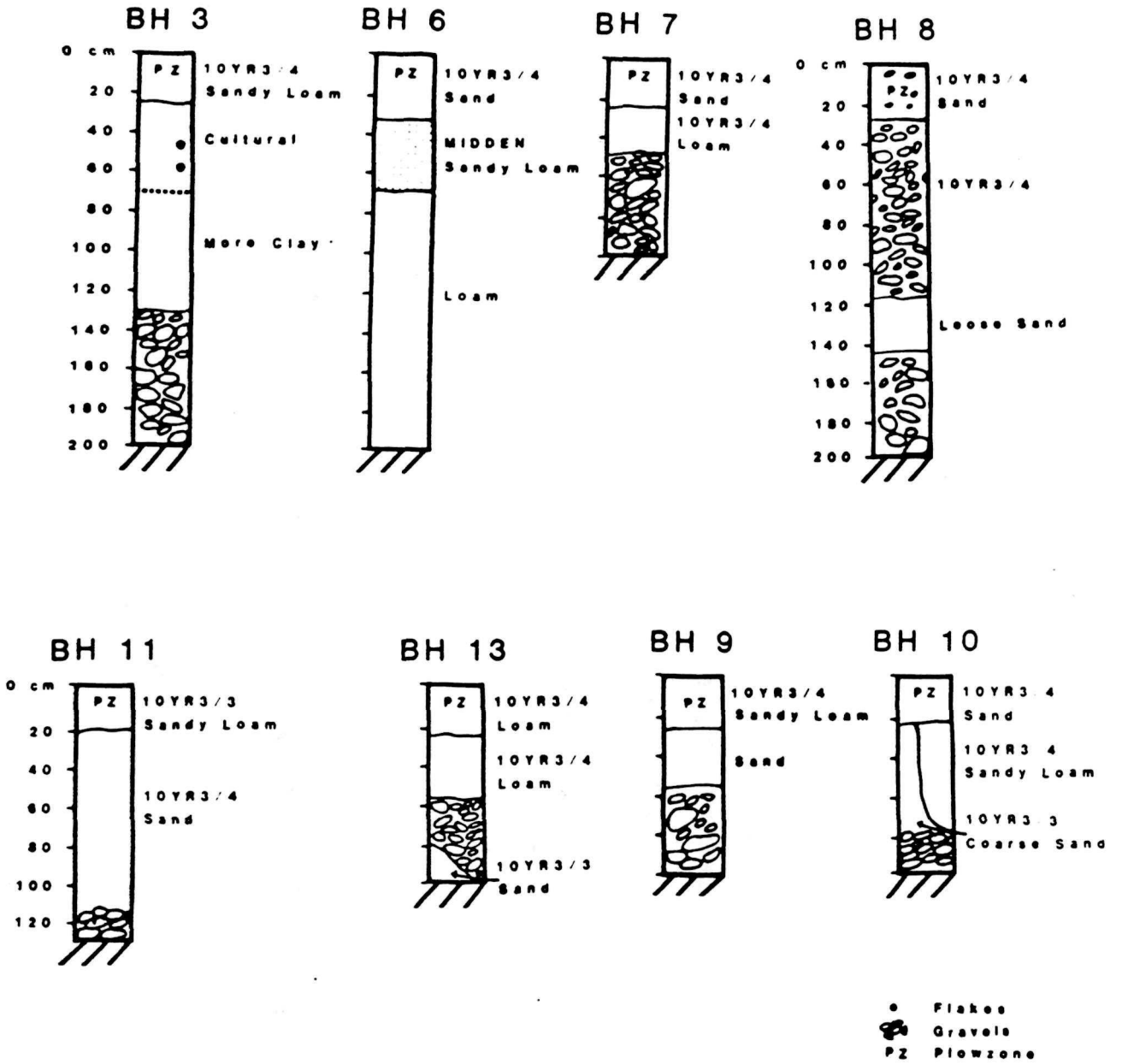


Figure 23. Profiles of Backhoe Trenches 3, 6-11 and 13, 3NW662.

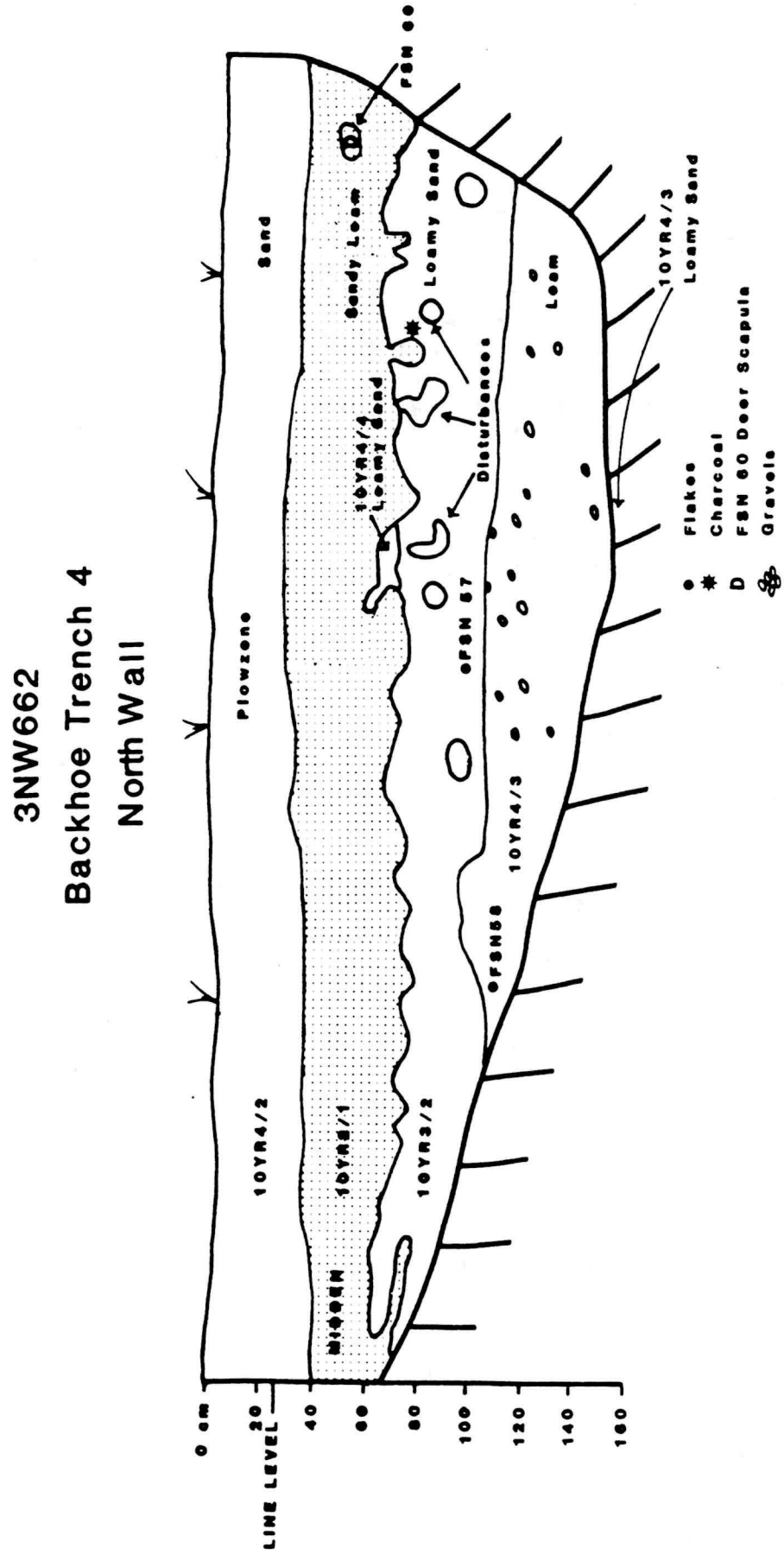


Figure 24. Profile of Backhoe Trench 4, 3NW662.

Backhoe Trench 10: Natural Strata

Backhoe Trench 10 was positioned in a swale (Figure 23). It disclosed a coarse sand directly above a gravel area. Toward the west end of both the north and south walls of the trench was an intrusive sediment which consisted of an inward sloping pocket of sandy loam. It continued into the west wall. This area was cleaned scraped and examined closely but did not contain cultural material. The different sediments in this trench are believed to have been the result of scour and fill associated with the opening of the swale during times of high water. The loose sand may have been deposited as recently as the 1940 flood.

Backhoe Trench 11: Gravels

Backhoe Trench 11 (Figure 23) was excavated on the slope and east side of a low rise. It contained a loose sand above gravels. No cultural material was found in this trench or observed in the backdirt.

Backhoe Trench 12: Cultural Strata?

Backhoe Trench 12 (Figure 25) was placed at the southern end of the site. It was adjacent to Plowed Transect N where an untyped corner/basal notched projectile point fragment (FSN 42-1; Figure 38e) was found. This artifact dates to the Archaic period. The trench contained hard and compact sediments. The backhoe had difficulty excavating it. Hand scraping and cleaning was almost impossible. No artifacts were observed below the plowzone, but they may have been hidden in the concrete-like sediments. Two preforms and one flake fragment were found in the backdirt. Since the sediments have characteristics of being quite old, it is likely that cultural deposit dating to the Archaic period or earlier may be found in this end of the site. Geomorphic research in this location may indicate old deposits. Additional tests with improved ground moisture conditions would facilitate future archeological investigations.

Backhoe Trench 13: Channel Deposits

Backhoe Trench 13 (Figure 23) was placed in a swale. It contained alternating lenses of gravel and loose sand characteristic of an active river course. No cultural material was observed in this trench.

Riverbank Cut, North End: Deeply Buried Cultural Strata

West of Plowed Transect G the Buffalo River is actively cutting into the flood plain. Two preforms have eroded out of the slumped bank and were lying at the base of the 2 m high cut bank. Sediments consisted of yellowish brown loam which is about 2 m thick on top of basal gravels. No banding or obvious substrata within the deep loam were observed. The original depth and position of the artifacts is not known. Similar sediments were found in Test Unit 1 which contained cultural materials to

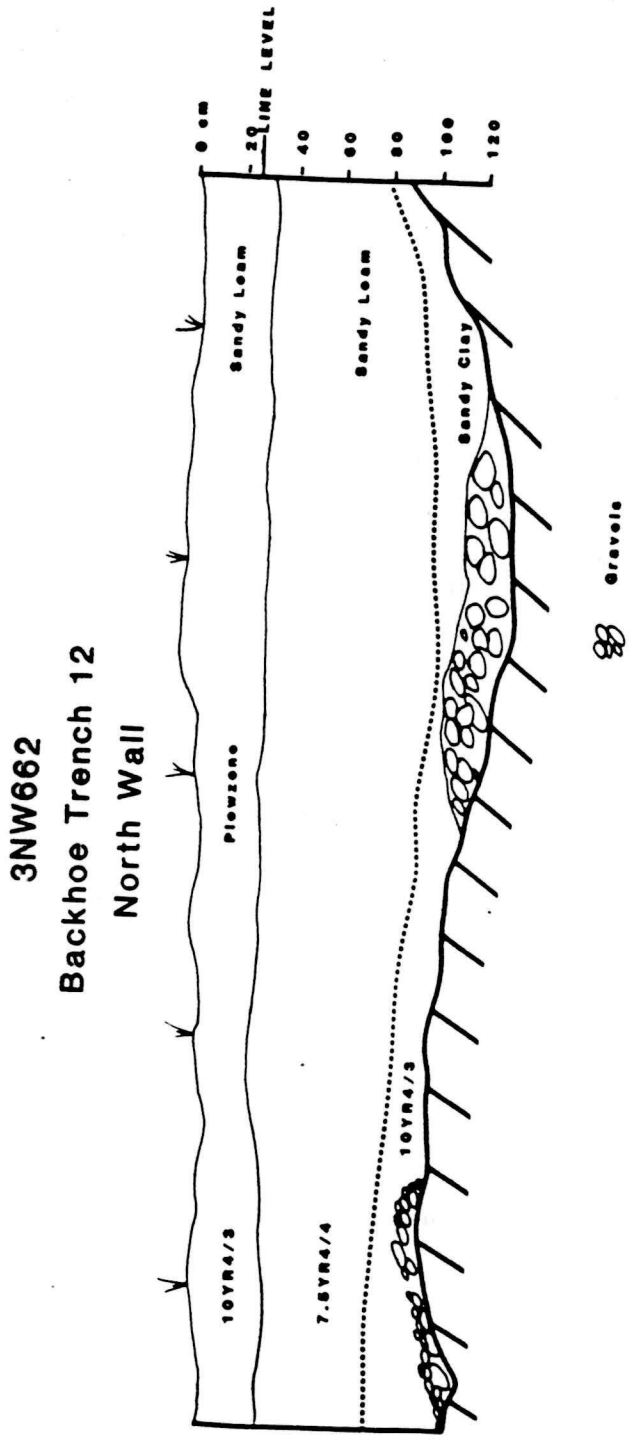


Figure 25. Profile of Backhoe Trench 12, 3NW662.

at least 1 meter where the unit was terminated. Deep stratified cultural deposits remain in this vicinity of the site.

Riverbank Cut, South End: Deeply Buried Cultural Strata

Outside the area investigated under this contract and at the south end of the tract is a small field which is being actively eroded by eastward movement of the Buffalo River. Prehistoric artifacts were not found in shovel tests excavated by Guy Weaver in 1985. During the present study, SPEARS observed two artifacts in this cut bank which is over 2.5 m high. One was a white Boone chert flake which was found about 50 cm below the surface. The other was a thick biface of gray chert which was about 1 meter below the surface. A dark brown lens was evident below the plowzone, however, both these artifacts were within a lower stratum consisting of yellowish brown loam which was dry, compact and baked by the sun. Due to the presence of these deeply buried artifacts, the site boundaries are extended to include this field. The characteristics of the landform at this location on the Buffalo River has similarities to the location of buried Paleo-Indian sites found elsewhere (Coe 1964) and those projected in Arkansas (Taylor 1975; Baker 1975).

SCRAPES

Nine scrapes were excavated and hand cleaned at the Luallen Site (Figure 15). Of these, six disclosed features, intact strata or cultural middens. All were placed inside the plowed transects. Sizes of the clean scraped areas are presented in Table 16.

Table 16. Measurements of Scrapes, 3NW662.

SCRAPE	LENGTH(m)	WIDTH(m)	DEPTH(cm average)
1	2.5	2.5	36
2	3.0	2.5	38
3	3.6	3.2	30
4	4.9	3.2	25
5	5.2	3.0	25
6	4.0	3.6	25
7	4.3	3.2	22
8	4.5	3.8	20
9	4.3	3.7	26

Scrape 1: Three Pit Features Intruding a Gravel Bar

Scrape 1 was positioned on the top of a north-south trending terrace. It was placed at the north end of Plowed Transect E which contained a high density of artifacts (Table 12 and Appendix D, Table D2). One shell tempered sherd (FSN 72-2) and numerous lithics were observed in this location. The sandy plowzone, which contained a moderate amount of gravels, was machine scraped. To determine the depth of the gravels, a small trench was excavated along the south side of the scrape. Below the plowzone were dense gravels with clasts over 80 cm in length. In profile, it was evident that the gravels continued at least one meter below the surface where the small trench was terminated.

During the hand cleaning of this scrape, well preserved animal and bird bones, charcoal, shell, and lithics were found. Initially the deposit was interpreted as a cultural midden; however, after scraping an additional few centimeters, it became apparent that the scrape contained three large pit features. One pit, which was cross sectioned in the shallow backhoe trench,was about 50 cm in depth. Artifacts collected from the top exposed surfaces of these pits are listed in Table 17. The bones have been tentatively identified as: 10 deer (unburned), 2 deer (burned), 4 unidentified small mammal (including 1 vertebra and 1 mandible, unburned), and 4 bird bones (unburned). These pits were not excavated.

A soil sample from Pit 1 was submitted to the Soil Testing and Research Laboratory, University of Arkansas, Fayetteville. Results of this test were: pH=8; Organic Matter=3.2%; Phosphate=68ppm; Potassium=60ppm; Calcium=7900ppm; Magnesium=40ppm and Sodium=110ppm (Lab No. 80549). The moderate alkalinity of the sediments is one reason the bone is so well preserved. Organic matter is high compared to the average content of soils in the United States which is 2% in the topsoil and 0.8% in the subsoil (Toney 1975:111). Phosphate and calcium are also very high indicating that much decayed bone is present.

These features document prehistoric use of a gravel bar. The excavation of the pits, analyses, and dating of their contents should provide information on diet and the species available locally. Hypotheses related to whether they represent one event, and whether this event is associated with a ceremony or a season could be tested. The relationship of these pits to other features should also be researched and will provide a better understanding of the activities conducted in this vicinity of 3NW662.

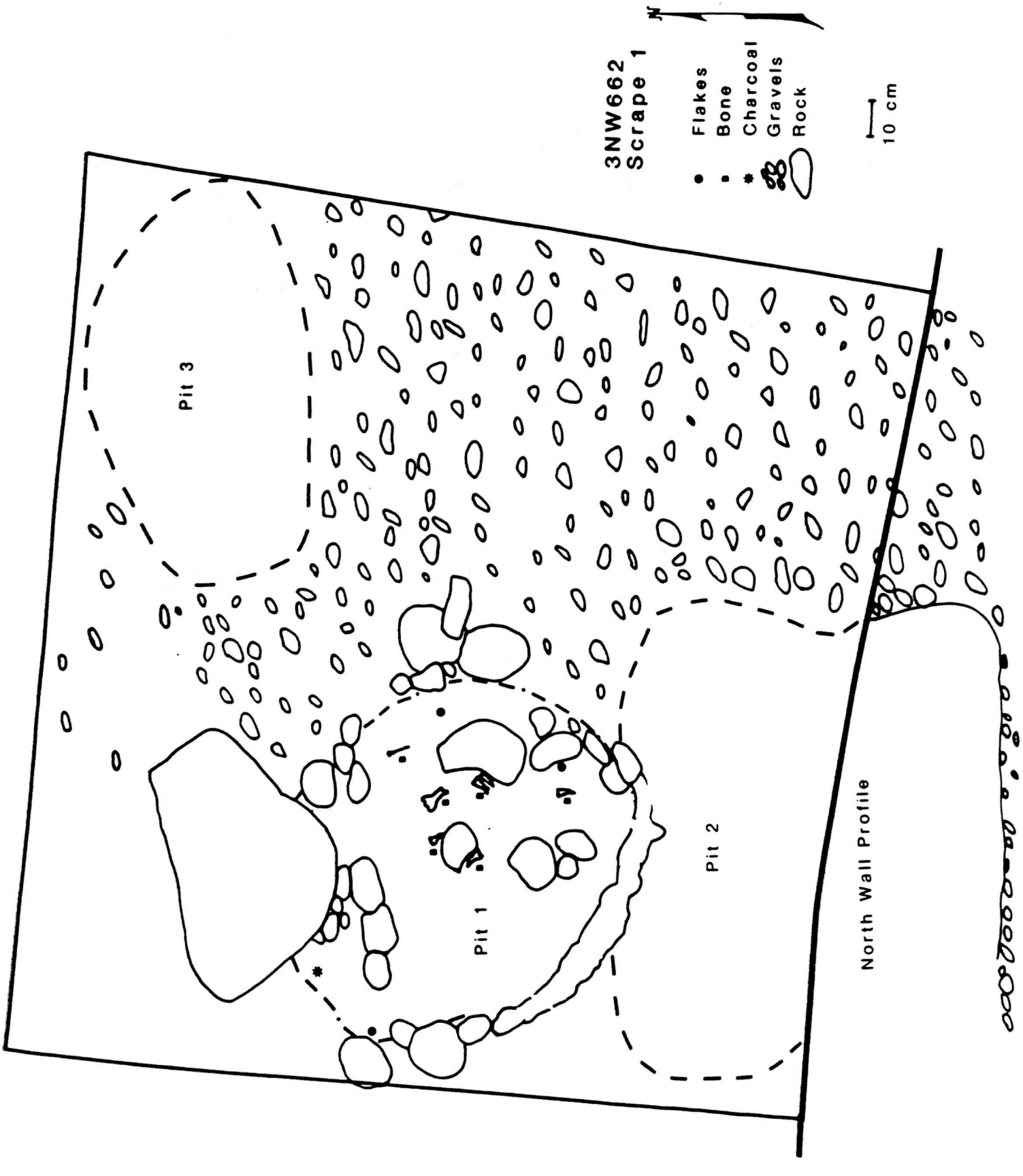


Figure 26. Plan View and Cross Section of Pits in Scrape 1, 3NW662.

Table 17. Artifacts Collected in Scrapes, 3NW662.

Abbreviations Used:P=PROJECTILE POINT/KNIFE; P=PREFORM; UF=UTILIZED FLAKE; C=CORE; PFL=PRIMARY DECORTICATION FLAKE; SFL=SECONDARY DECORTICATION FLAKE; IFL=INTERIOR FLAKE; FF=FLAKE FRAGMENT; PT=PREFORM THINNING, BT=BIFACIAL THINNING; FC=FIRE CRACKED ROCK; U=UNMODIFIED ROCK; BO=BONE; S=SHELL; SH=SHELL TEMPERED POTTERY; N=NUTSHELLS; AND CL=BURNED CLAY.

LOCAT	P	P	UF	C	PFL	SFL	IFL	FF	PT	BT	FC	U	BO	S	SH	N	CL	TOTAL
SC1			3				5	1	1			2	20	3				35
SC5				1		1	6					1						9
SC6	1	1										1						3
SC7	1	1		2	1	5	22	14	2	2	4	7						61
SC8					1	1	20	14				7			33	X	1	77
SC9		1					14	2			1	2	1		7	X		28
TOTAL	2	3	3	3	2	7	67	31	3	2	5	20	21	3	40	x	1	213

Scrape 2: Natural Sediments

Scrape 2 was placed in Plowed Transect K where a medium density of artifacts was observed on the surface (Figure 15). One Reed arrowpoint (FSN 29-1; Figure 34b) and one untyped straight to slightly expanding stemmed projectile point (FSN28-1; Figure 39d) were collected in this vicinity. On the surface and in the plowzone was a loose sand. A compact darker sand was evident beneath the plowzone; however, no feature stains or clusters of artifacts were discovered in Scrape 2. All artifacts were confined to the upper disturbed plowzone level. The sediments were similar in color and texture to those observed in Backhoe Trench 5 which likewise did not seem to contain intact cultural strata.

Scrape 3: Natural Sediments

Scrape 3 was positioned in Plowed Transect D where a low density of artifacts were found adjacent to the spring drainage (Figure 15). Sediments consisted of a sand which below the plowzone was slightly more compact and darker in color. The only artifacts observed were associated with the plowzone and plowscars.

Scrape 4: Natural Sediments

Scrape 4 was placed in Plowed Transect T where a low density of artifacts were observed on a barely discernible swale (Figure 15). The sediments consisted of a sandy loam with some natural gravels. No feature stains or artifacts were found in the scrape.

Scrape 5: Cultural Stratum

Scrape 5 was placed in an area with a low artifact density (Figure 15). The plowzone consisted of a loose sand. Below it was a more compact and darker sandy loam which contained lithic artifacts (Table 17) and flecks of wood charcoal. No features were observed, but it would be difficult to distinguish them in the dark cultural stratum.

Scrape 6: Cultural Strata

Scrape 6 was located in an area with a low artifact density and in the vicinity of the alleged burials (Figure 15). The plowzone was a loose sandy loam which was underlain by a sandy loam containing natural gravels. The scrape did not contain feature stains or obvious clusters of artifacts. The cultural material found included one resharpened Gary projectile point (FSN67-1; Figure 36d), one preform, and one unmodified angular fragment. No charcoal and no bone were evident. Test Unit 1, positioned west of this scrape, verified that this and the deeper buried strata are cultural.

Scrape 7: Midden

Scrape 7 was positioned within an area containing a low to medium artifact density including one Sequoyah arrowpoint (FSN 68-1, Figure 35f). Below the recent plowzone were old north-south trending plowscars and between and beneath them was a more compact dark, almost black, greasy midden. It contained a high density of lithics (Table 17) and wood charcoal. Features were not discernible. Upon closer inspection of sediments in the plowed transects, the midden was evident in an area measuring about 12 m x 30 m, but, as test units indicate, there are areas where the midden is buried and has not been disturbed by plowing.

Scrape 8: Mississippi Midden

Scrape 8 was placed in an area which contained a medium to low artifact density (Figure 15). Two shell tempered sherds were collected near the intersection of Plowed Transect M and P. The plowzone was a loose sand and below it was a darker almost black sandy loam which was a cultural midden. This scrape contained the highest observed density of shell tempered pottery with a total of 33 sherds collected (FSN70-12,-13,-14). The ceramics were dispersed over the entire scrape, but many of the sherds were vertical indicating possible disturbances or pit features. No feature stains or clusters of artifacts were identified.

Scrape 9: Mississippi Midden

Scrape 9 was positioned in an area containing a medium density of artifacts (Figure 15). The plowzone was a loose sand. Below it at the south end of the scrape was either midden or

overlapping pit features with non distinct pit outlines (Figure 27). Seven shell tempered sherds and other artifacts collected in the scrape are listed in Table 17. A dense cluster of cobbles was exposed in the center. Most of these stones were broken sandstone cobbles which appear to be burned. They may have been discarded in a pit. One small stain in the northwest corner of the scrape was 10 cm in diameter. In cross section, it had straight sides, a flat base, and was 7 cm deep. It contained bird bone fragments (FSN 78-1) and charcoal. This stain may be the lower portion of a postmold. Another small gray stain was cross sectioned, but it had an irregular base, was only 3 cm deep and is probably a natural feature.

TEST UNITS

Six 1 m x 1 m test units were excavated at the site. These were positioned in areas with middens (Test Units 2, 3, 6), in areas containing low densities of artifacts (Test Units 1, 5) and within an area with surface gravels (Test Unit 4). Test units were distributed widely across the site. Due to dry compact sediments, a high density of artifacts, intact strata which in some cases extended beyond 1 meter, and features, the excavation of these six units was labor intensive requiring much more time and effort than was estimated.

Test Unit 1: Deeply Buried Cultural Deposits

Test Unit 1 was positioned closest to the river near Scrape 6 (Figure 15) which exposed artifacts within a cultural stratum. The south wall profile is shown in Figure 28 and artifacts collected are listed in Table 18.

The sod was removed and set aside. The plowzone was evident to about 25 cm. It contained a relatively low density of artifacts including one corner notched projectile point (FSN 83-1; Figure 38f) and one projectile point midsection. Below the plowzone was a brown loam which contained small flecks of charcoal and few artifacts. In the central portion of the unit was a dark amorphous stain which in subsequent levels was interpreted as a natural feature (tree root or rodent burrow). From 40-50 cm only one artifact was collected, but the sediments contained small flecks of charcoal. From 50-60 cm few artifacts were collected and there was no change in the sediments except for an increase in clay content with depth. From 60-70 cm even fewer artifacts were found and from 70-80 cm no artifacts were collected. However, from 80-90 cm there was an increase in cultural material with 11 lithics collected (Table 18) and likewise from 90-100 cm cultural material was found. No features stains or clusters of artifacts were observed. The test unit was terminated at this depth due to the difficulty of excavating such a small unit. None of the artifacts are temporally diagnostic, therefore the age of these sediments is unknown. A soil core below 1 m disclosed the following: 1 - 1.54 m, 10YR4/3

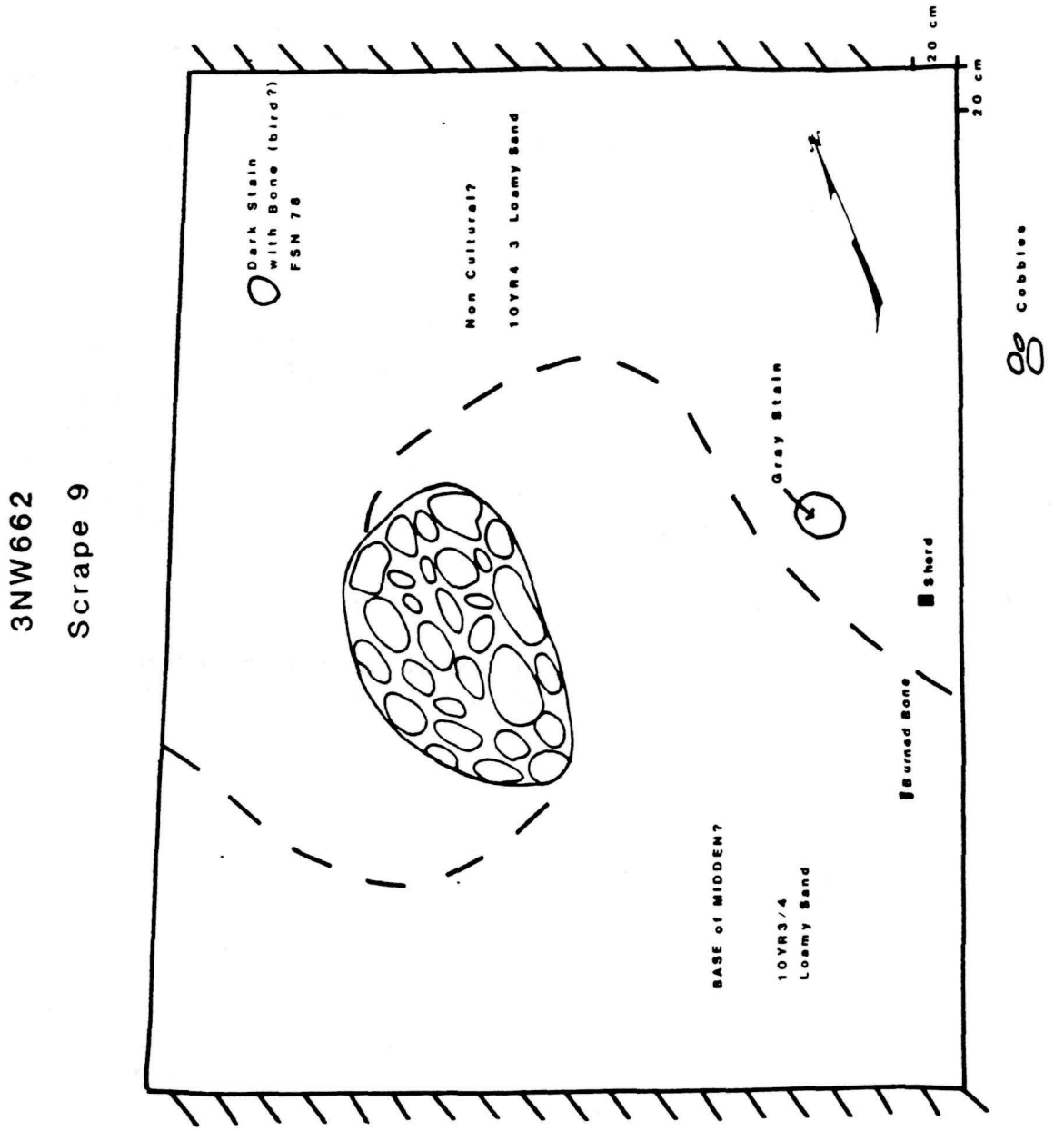


Figure 27. Plan View of Scrape 9, 3NW662.

loam; 1.54 - 1.7 m, 10YR4/3 sandy clay loam; 1.7 - 1.74 m, 10YR4/3 coarse sand; and at 1.74 m the basal gravels were evident. The presence of artifacts without visible stratigraphy is one indication that this surface was prehistorically utilized, buried under river sediments which have not been disturbed and have weathered. This entire sequence of events was repeated and could account for the similar color and texture of the entire stratigraphic profile.

Table 18. Artifacts Collected in Test Unit 1, 3NW662.

Abbreviations Used:P=PROJECTILE POINT/KNIFE; PF=PRIMARY DECORTICATION FLAKE; SF=SECONDARY DECORTICATION FLAKE; IF=INTERIOR FLAKE; FF=FLAKE FRAGMENT; PT=PREFORM THINNING, BT=BIFACIAL THINNING; UN=UNMODIFIED ROCK; CH=CHARCOAL.

LOCATION	P	PF	SF	IF	FF	PT	BT	UN	CH	TOTAL
TU1 0-10					1					1
TU1 10-20	1		1	2	2					6
TU1 20-30	1				3					4
TU1 30-40		1		2		1				4
TU1 40-50						1				1
TU1 50-60					1	1				2
TU1 60-70		1								1
TU1 80-90		1		4	4			2	X	11
TU1 90-100				3	2		1	4		10
total	2	3	1	11	13	3	1	6	X	40

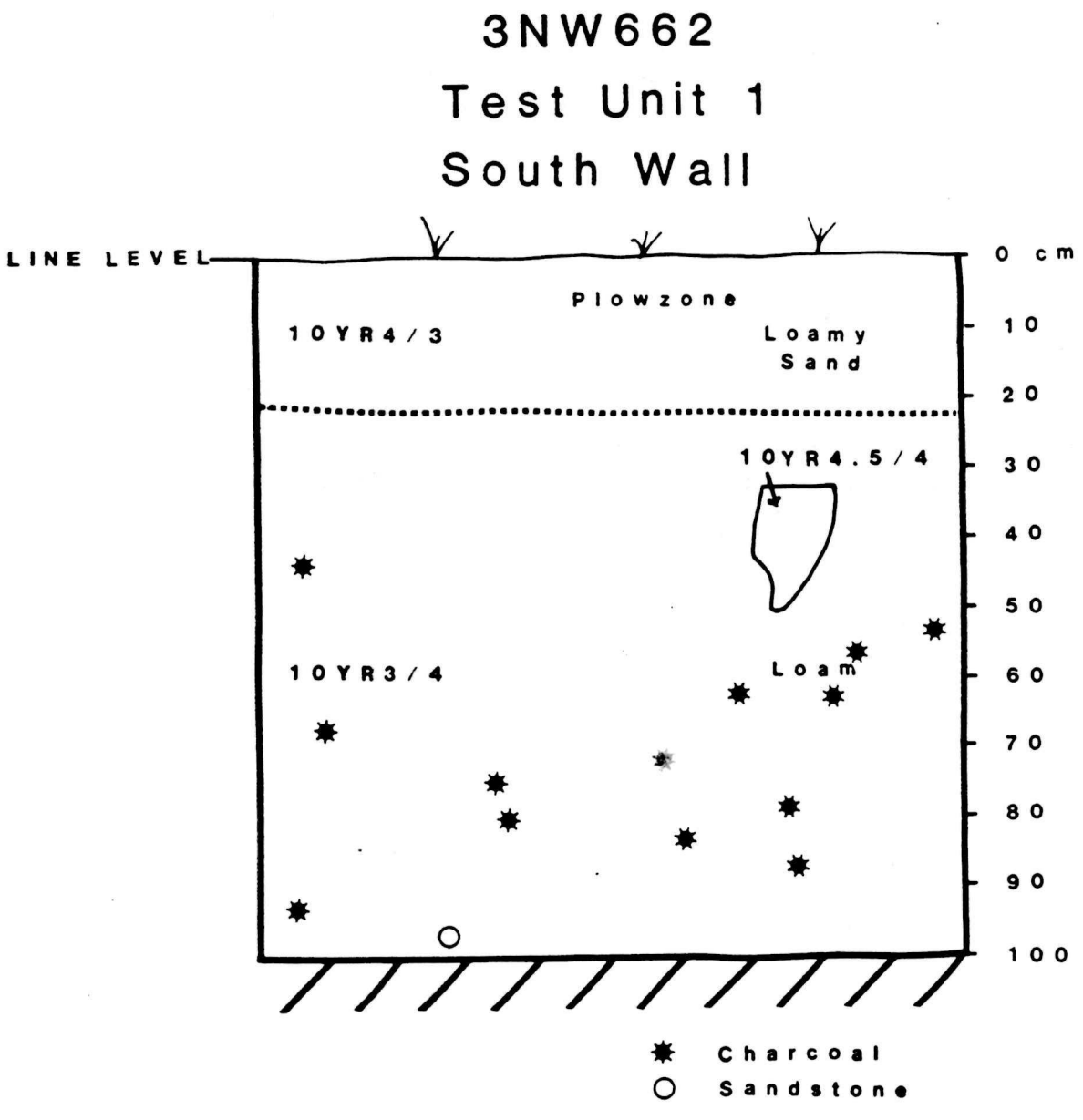


Figure 28. Profile of Test Unit 1, 3NW662.

Test Unit 2: Disturbed Mississippi Midden and Intact, Buried Woodland Stratum

Test Unit 2 was positioned south of Scrape 8 which contained midden and a high density of shell tempered ceramics (Figure 15). The south wall of this test unit is shown in Figure 29 and the artifacts collected are listed in Table 19.

Table 19. Artifacts Collected in Test Unit 2, 3NW662.

	0-10	10-20	20-30	30-40	40-50	50-60	60-70	total
PP/K & FRAGS	1							1
SECONDARY DECORT			1					1
INTERIOR FLAKE	4	19	24	24	33	28	3	135
FLAKE FRAGMENTS	6	14	30	26	35	27	1	139
PREFORM THINNING		2	2	2	5		1	12
BIFACE THINNING				1	1			2
PRESSURE FLAKE			1		2			3
LUNATE FLAKE					1	1		2
FIRECRACKED ROCK		4	4	5	4	2	1	20
UNMODIFIED STONE	1		3	1	4	2		11
SHELL TEMPERED	3	9						12
GROG TEMPERED						1		1
CARBONIZED WOOD					X			X
total	15	48	65	59	85	61	6	339

The plowzone extended about 25 cm below the surface. All of the shell tempered ceramics (12) were collected in this disturbed sediment dating to the Mississippi period. One distinct plowscar running northeast through the unit was evident in the clean scrape at 20 cm bd. Below the plowzone, there was a slight decrease in the frequency of material. A cluster of broken cobbles observed in the northeast quarter of the test unit is interpreted as a feature of unknown function. There was an increase in cultural material between 40-50 cm and another cluster of cobbles, over half of which are broken. Carbonized wood fragments and one grog tempered sherd with smoothed over cord-marking was found in the 50-60 cm level. At this depth the artifacts date to the Woodland period. From 60-70 cm there were fewer artifacts and the lower two levels from 70-80 cm and 80-90 cm did not contain any cultural material. A soil core placed in the base of this test hit gravels at 1.4 m below the surface.

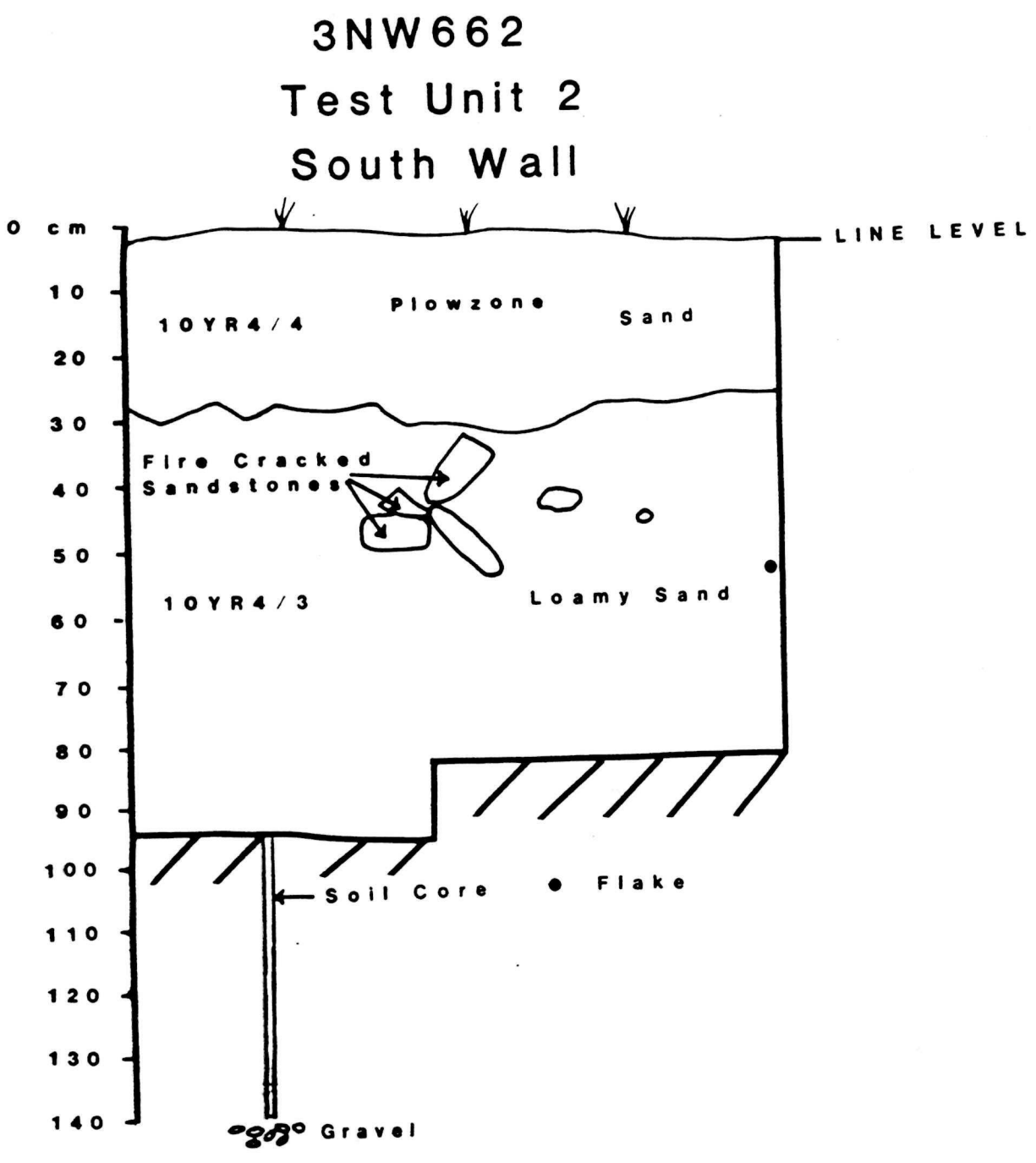


Figure 29. Profile of Test Unit 2, 3NW662.

Test Unit 3: Mississippi Midden and Postmolds

Test Unit 3 was also positioned within the vicinity of Scrape 8 to investigate whether the Mississippi midden was less disturbed in this location and to further delineate the extent of the deeper buried Woodland component. Artifacts collected are listed in Table 20. The south wall profile is presented in Figure 30.

The plowzone was not uniform in depth but averaged about 25 cm. It contained lithics and one shell tempered sherd. It was lighter in color than the Mississippi midden below, which contained charcoal, carbonized nutshells, four shell tempered sherds and lithics. At 30 cm there was a large stain in the center of the unit which continued to about 40 cm. It had fewer artifacts than the surrounding matrix and its function is not known. At 50 cm bs there were seven circular stains which were cross sectioned at this depth and below. Two stains (Figure 31) had profiles characteristic of postmolds. Both contained charcoal and artifacts and one contained a shell tempered sherd. Fewer artifacts were found in each subsequent level. The unit was terminated at 70 cm within a very compact sediment. A soil core placed in the base of the unit showed no change in sediment to 1.6 m bd. The intact Mississippi midden is about 30 cm thick in this location. The Woodland stratum, if present, would be much more deeply buried.

Table 20. Artifacts Collected in Test Unit 3, 3NW662.

	8-10	10-20	20-30	30-40	40-50	50-60	60-70	TOTAL
SECONDARY DECORT		1						1
INTERIOR FLAKE		12	7		1		2	22
FLAKE FRAGMENTS	2	8	4	1		2*		17
PREFORM THINNING			1					1
FIRECRACKED ROCK			4					4
UNMODIFIED STONE		5	1	2	1	2		11
SHELL TEMPERED		1	4			3*		8
BURNED CLAY			1					
ANIMAL BONE						2*		2
NUTSHELLS & WOOD			X	X				X
total	2	27	22	3	2	9	2	67

* Collected from postmolds.

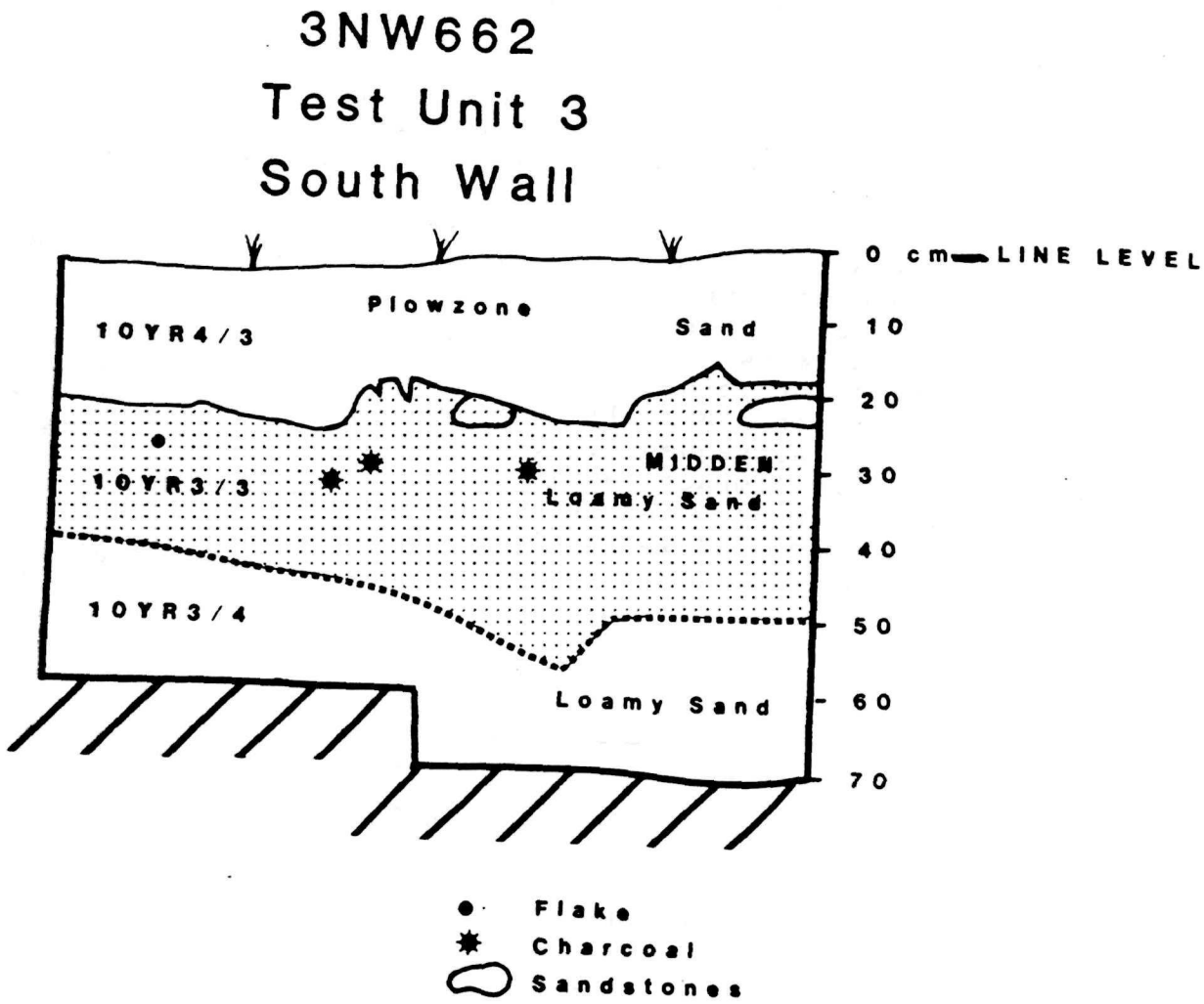


Figure 30. Profile of Test Unit 3, 3NW662.

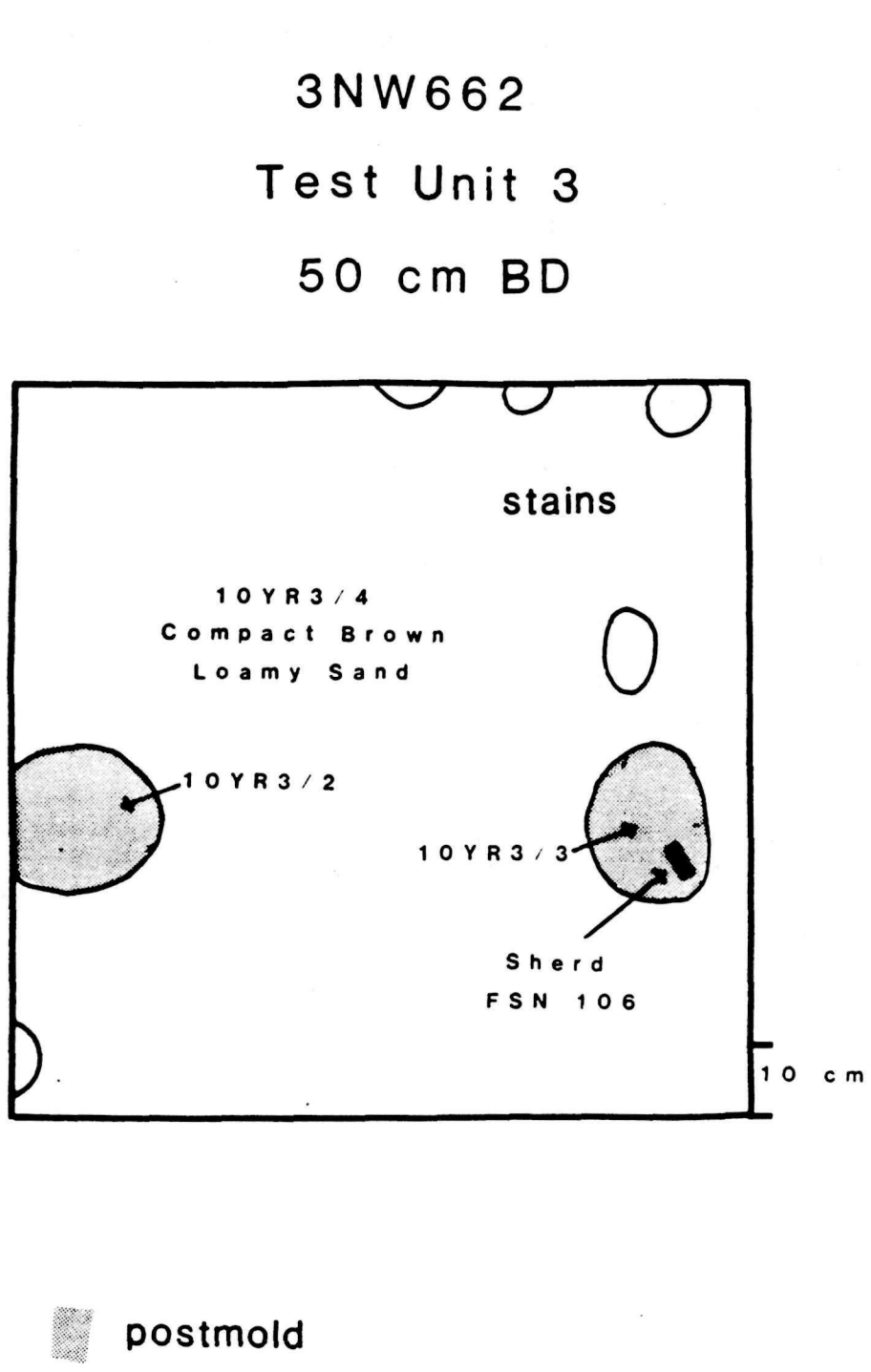


Figure 31. Floor Plan of Postmolds in Test Unit 3, 3NW662.

Test Unit 4: Gravel Bar with No Extensive Prehistoric Utilization

Test Unit 4 was positioned north of Plowed Transect A in an area containing numerous gravels to determine if this gravel bar was as extensively utilized as the one in the vicinity of Scrape 1. The artifacts collected in this test unit are listed in Table 21 and the west wall profile is shown in Figure 32.

Table 21. Artifacts Collected in Test Unit 4, 3NW662.

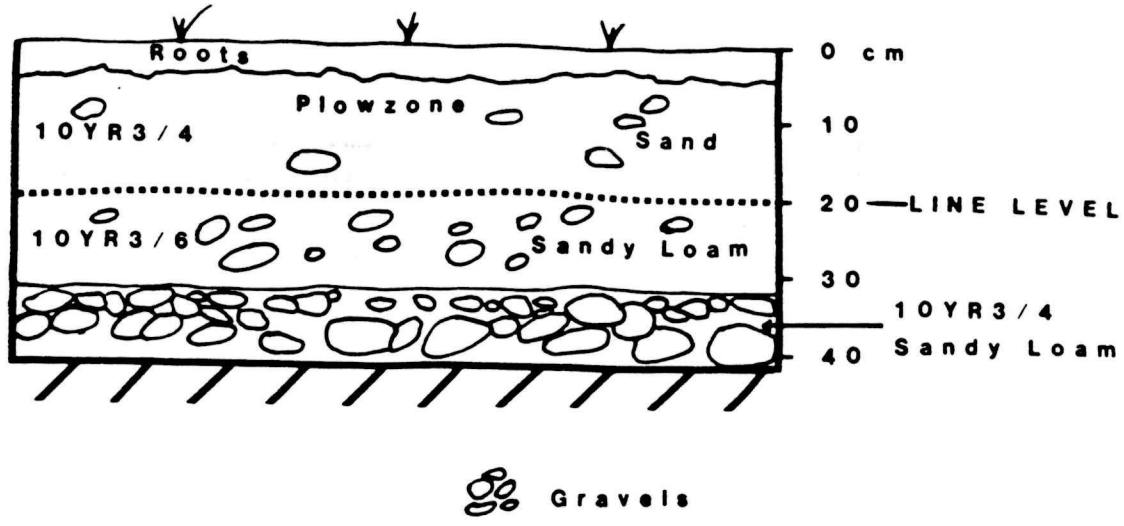
LOCATION	INTERIOR FLAKE	FLAKE FRAG	FCR	UNMODIFIED STONE	TOTAL
TU4 0-10	1	3		1	5
TU4 10-20	4	3	1		8
TU4 20-30	4				4
total	9	6	1	1	17

The sediments in the plowzone were dry and compact and contained numerous gravels. The plowzone extended to about 20 cm bd where there was a slight change in color and texture. The gravels increased with depth and the top of an extensive gravel bar with clasts up to 40 cm began at about 28 cm bd. The gravel level was excavated another 10 cm, but no cultural material or feature stains were found.

Test Unit 5: Buried Cultural Stratum

Test Unit 5 was positioned in an area where former residents remembered burials had washed out. The unit was located on the top edge of an older terrace and near Scrape 5 which contained cultural strata (Figure 15). The artifacts collected in Test Unit 5 are listed in Table 22 and the South Wall Profile is shown in Figure 32.

3NW662
Test Unit 4
West Wall



3NW662
Test Unit 5
South Wall

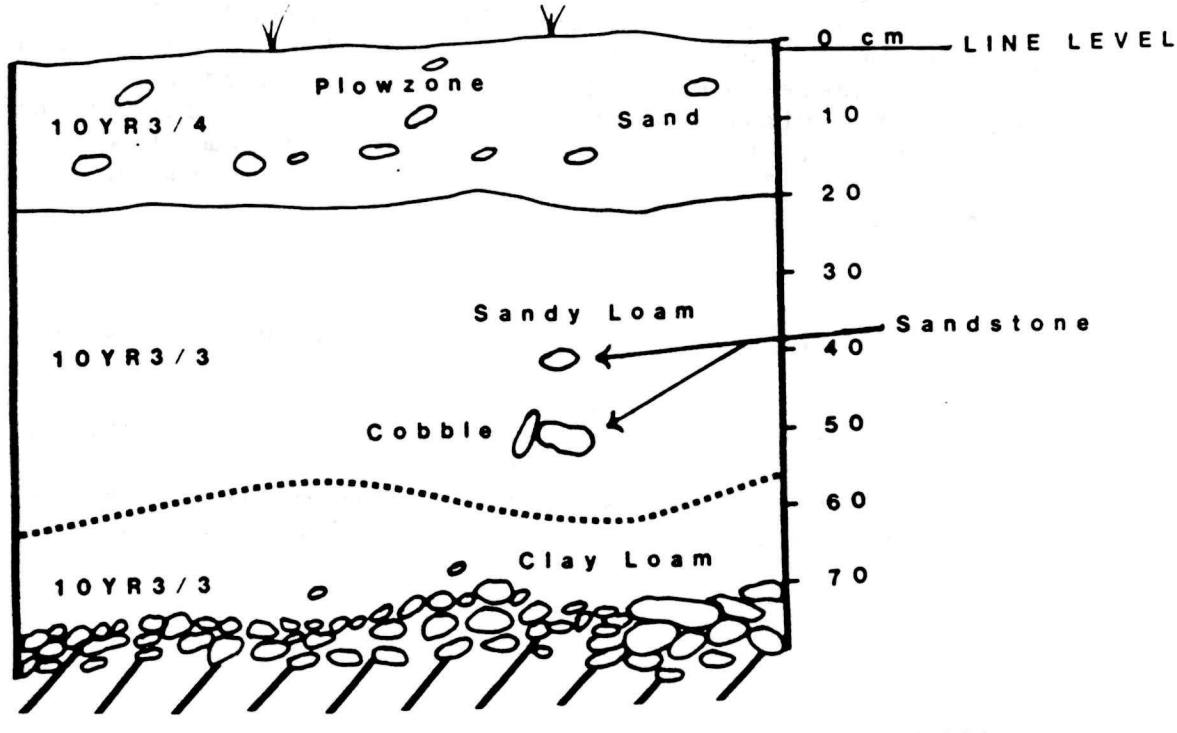


Figure 32. Profiles of Test Units 4 and 5, 3NW662.

Table 22. Artifacts Collected in Test Unit 5, 3NW662.

Abbreviations Used:AP=ARROWPOINT; C=CORE; FCR=FIRE CRACKED ROCK; N=NUTSHELLS.

DEPTH	AP	BIF-FACE	UTIL FLK	C	INT FLK	FLK FRAG	PREF THIN	BIFACIAL THIN	FLK	PRESS FLK	LU-ATE	FCR	UNMOD ST	N	TOTAL
0-10	1	1			7	4							2		15
10-20			1	1	7	7	1						2		19
20-30					3	4									7
30-40					5	2		1							8
40-50					5	22	1	1		2	2	1			34
50-60					13	4	1	3		4		7			32
60-70			1		2	3						1		X	7
70-80					1	1									2
total	1	1	2	1	43	47	3	5		6	2	9	4	X	124

The plowzone extended to about 25 cm bd and contained one arrowpoint midsection (FSN 103-1) and lithic artifacts. The sediments were compact with natural gravels. From 20-30 cm and 30-40 cm bd there were few artifacts and no features. From 40-50 cm bd, artifact density increased along with charcoal and river cobbles, some of which were broken and burned. This level and the level below (50-60 cm) are interpreted as buried cultural strata of indeterminate age. From 60-70 cm bd is a transitional level which contained fewer artifacts and no features or artifact concentrations. One carbonized nutshell fragment was collected in this level. The unit was terminated at 80 cm bd at the top of the gravels.

Test Unit 6: Woodland Midden with Intrusive Mississippi Component

Test Unit 6 was positioned within the vicinity of the 40 cm thick midden as observed in Backhoe Trench 4 (Figure 24). The South Wall Profile of Test Unit 6 is presented in Figure 23. Over half of the entire artifact sample collected at the Luallen site was recovered in this test unit (Tables 23 and 24).

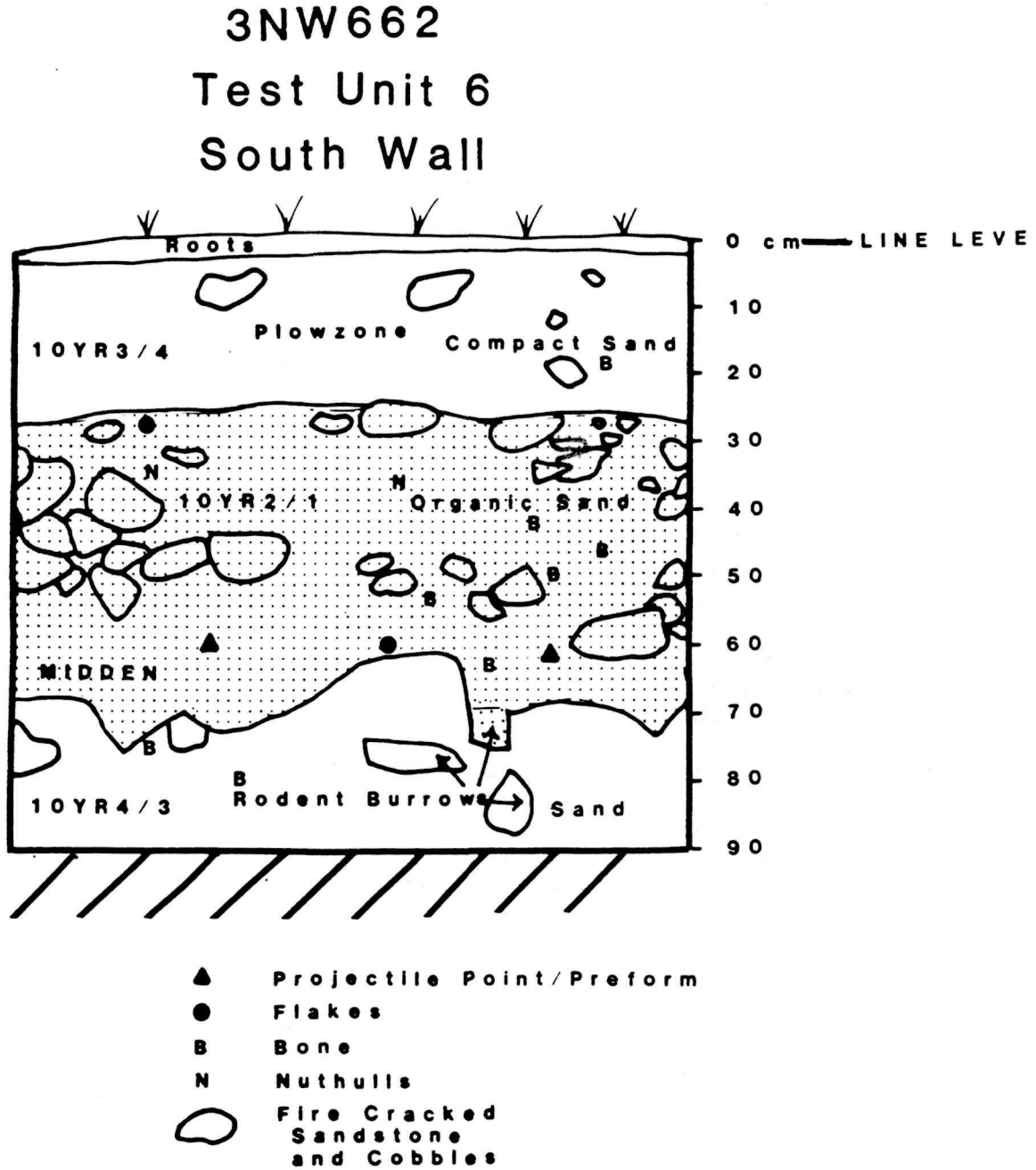


Figure 33. Profile of Test Unit 6, 3NW662.

Table 23. Artifacts Collected in Test Unit 6, 3NW662.

	0-10cm	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	TOTAL
ARROWPOINTS			2	2	1		1			6
PP/K & FRAGS	2	5	7	6	6	6	9	2	1	44
BIFACE		1			1					2
PREFORM		1	2		4		1		1	9
HAMMERSTONE			1				1			2
UTILIZED FLAKE	1				1	3	2			7
HOE FLK				1						1
CHISEL FRAG	1									1
CORES & FRAGS	1						3			4
TESTED COBBLE				1						1
PRIMARY DECORT	2	3	2	6	2	1	1			17
SECONDARY DECORT	5	10	7	5	3	3	2	1		36
INTERIOR FLAKE	141	164	318	198	214	212	161	49	43	1500
FLAKE FRAGMENTS	220	181	375	180	211	227	226	45	37	1702
PREFORM THINNING	11	7	29	19	29	14	19	3	6	137
BIFACE THINNING		2	2	2	2	5	7		3	23
PRESSURE FLAKE	5	8	8	17	13	27	19		3	100
LUNATE FLAKE						2				2
FIRECRACKED ROCK	49	40	103	55	65	74	38	14	11	449
UNMODIFIED STONE	43	26	76	19	14	35	24	6	2	245
SHELL TEMPERED			2	2						4
GROG TEMPERED		1				1				2
GRIT TEMPERED								1		1
BURNED CLAY						1	2	5		8
ANIMAL BONE	3	6	21	37	139	172	191	78	71	718
SHELL								1	8	9
NUTSHELLS & WOOD				X	X	X	X	X	X	X
total	483	454	955	550	705	783	707	199	195	5671

Table 24. Arrowpoints and Projectile Points in Test Unit 6, 3NW662.

DEPTH	CT	DESCRIPTION	FSN	FIGURE
0-10	1	pp/k tip	113-2	
	1	pp/k base	113-1	
10-20	2	Gary	114-1	36e
			114-2	36f
	3	pp/k midsections	114-3	
			114-4	
20-30	1	Reed arrowpoint	115-1	34h
	1	Serrated arrowpoint	115-4	
	1	Gary	115-2	
	2	side notched	115-1	40h
			115-3	40i
	1	pp/k tip	115-6	
	3	pp/k midsections	115-7,115-8,115-9	
30-40	1	Reed arrowpoint	116-3	
	1	corner notched ap	116-2	35g
	1	Gary	116-1	37g
	1	pp/k tip	116-4	
	4	pp/k midsections	116-5,116-6,116-7	
40-50	1	Scallorn? ap	117-4	35h
	3	Gary	117-2	36g
			117-3	36h
			117-1	
	1	pp/k tip	117-5	
	2	pp/k midsection	117-6	
50-60	3	Gary	118-1	36a
			118-2	37h
			118-3	37i
	3	pp/k tips	118-4,118-5,118-6	
60-70	1	arrowpoint frag	121-4	
	2	Gary	121-1	37j
			121-2	37k
	1	contracting stem	121-3	39e
	4	pp/k tips	121-5,121-6,121-7	
	2	pp/k midsections	121-8	
70-80	1	Gary	122-1	
	1	pp/k midsection	122-2	
80-90	1	pp/k tip	125-1	

Levels 1, 2 and 3 (0-30 cm) of the plowzone contained some animal bone and numerous lithics including natural gravels and fire cracked rock (not collected). In the second level one grog tempered sherd, two arrowpoints and seven projectile points were collected (Table 24). About 40% of the 20-30 cm level was fire cracked sandstone and the base of this level is literally paved with rock. Two shell tempered sherds were found.

The intact midden begins at 30 cm bd. Two shell tempered sherds were found in situ at 31 cm bd. Two arrowpoints and one Gary projectile point were collected from this level. It also contained a dense concentration of firecracked sandstone cobbles which comprised about 60% of the level by volume. A few of the cobbles were limestone. From 40-50 cm and 50-60 cm bd the midden continued, and there was an increase in the density of artifacts but slightly fewer fire cracked rocks. One grog tempered sherd was found in the 50-60 cm level. The rock density decreased in the 60-70 cm and there was a slight decrease in the density of material. The clean scrape at this level disclosed many mottled stains all of which were irregular in shape and were interpreted as rodent burrows or tree roots. The only artifacts, including one small grit tempered sherd (70-80 cm bd) below the base of the midden, were confined to these natural stains. The unit was terminated at 90 cm bd.

In summary, the midden is about 40 cm thick. Test Unit 6 contains a high density of material with a total of 5,671 artifacts collected with up to 955 artifacts per 10 cm level of midden. Not counted within this sample are the fire cracked rocks, mostly sandstone, which are obviously culturally derived. The midden contains animal bone in an excellent state of preservation. Floral materials include wood charcoal and carbonized nutshells. Tools and diagnostic artifacts included 6 arrowpoints, 13 Gary projectile points, 1 untyped contracting stem, 2 side notched, 12 pp/k tips, 15 midsections, 1 base, 2 grog tempered sherds, 1 grit tempered sherd and 4 shell tempered sherds. These artifacts indicate that the midden developed primarily by extensive occupation during the Woodland period with less use/occupation during the Mississippi period.

Raw Material Frequencies Within Test Units

The artifacts collected from the test units were used to compute the frequency of raw materials at the site. Since the Luallen site dates primarily to the Woodland and Mississippi periods, this date should reflect raw material availability and preference during these periods. Table 25 shows the raw material counts and frequencies per test unit and the composite frequency for all the test units.

Table 25. Raw Material Frequencies in Test Units, 3NW662.

	BOONE		PITKIN		OTHER CHERT		SILT-STONE		SAND-STONE		OTHER		TOTAL	
UNIT	CT	%	CT	%	CT	%	CT	%	CT	%	CT	%	CT	%
TU1	17	42.5	8	20.0	7	17.5	4	10.0	4	10.0			40	100.0
TU2	223	67.6	61	18.5	30	9.0	16	4.8					330	99.9
TU3	34	65.4	13	25.0	4	7.7	1	1.9					52	100.0
TU4	11	64.7	3	17.6	3	17.6							17	99.9
TU5	60	48.8	34	27.6	14	11.4	15	12.2					123	100.0
TU6	2294	53.4	680	15.8	944	22.0	356	8.3	3	.06	18	.4	4295	99.9
Test Unit 6														
>40	1239	52.3	457	19.3	490	21.0	172	7.2	3	.1	10	.4	2371	100.3
<40	1055	54.8	223	11.6	454	23.6	184	9.6			8	.4	1924	100.0
ALL TEST UNITS														
	2639	54.3	799	16.4	1002	20.6	392	8.1	7	0.1	18	.4	4857	99.9
3NW663														
	3021	71.8	739	17.6	311	7.4	122	2.9	12	.3	3	.1	4208	100.1

Results of the frequencies when compared to frequencies at the Sattler Site (3NW663), which dates to the Archaic period, indicate that a wider variety of materials were available and used during the later periods and a lower percentage of Boone chert was evident (Table 25). The frequency of Pitkin chert has been shown to be high in the Archaic, decreases in the Woodland and increases in the Mississippi period (Ray 1986). Using the stratified data from Test Unit 6 for the Mississippi period (0-40 cm) and the Woodland (40 cm and below) and using the Sattler Site (3NW663) for the Middle Archaic, this pattern is supported. Pitkin chert is a good quality local material.

Siltstone is more predominant in the Woodland than Mississippi periods. This higher frequency of siltstone has been observed in other studies (Raab 1976; Fritz 1979; Brown et al. 1978). This shift is attributed to a change in subsistence technologies between hunter/gatherers/bottomland horticulturists as compared to full blown agriculture.

DIAGNOSTIC LITHIC ARTIFACTS
by Robert A. Taylor

The following are descriptions of all of the whole or typeable lithics collected at the site. These artifacts have been

mentioned by provenience in the above discussion. Photographs of selected specimens are presented in Figures 34-41. Measurements are presented in Appendix C.

Arrowpoints

Twenty-two arrowpoints and fragments were collected at 3NW662. Six of these were collected from Test Unit 6 and one from Backhoe Trench 4 adjacent to that test unit. Fourteen were collected in the plowed transects on the surface of the site, and one was found in the plowzone of Test Unit 5. There is considerable variation among these artifacts and only a few can be assigned with confidence to defined types.

Reed: Three complete specimens and one basal fragment are Reed arrowpoints (Chapman 1980:311; Bell 1958:76-77). All have triangular blades with side notches and nearly straight bases. The three whole arrowheads are made from Boone chert and one of them is obviously heat treated. The basal fragment is Pitkin chert. Small portions of the original flake surface are visible on one face of all three complete specimens. One whole specimen and the fragment (FSN115-4, Figure 34h; FSN116-3) were collected in Test Unit 6 at 20-40 cm below datum. The other two (FSN 29-1, Figure 34b; FSN31-1, Figure 34c) were found on the surface in the plowed transects. Reed arrowpoints date from the Early to Middle Mississippi period and occur in the Loftin phase along the White River in southwest Missouri, where associated artifacts have been radiocarbon dated to about A.D. 1100 (Chapman 1980:139-142).

Rockwall: Two arrowpoints are tentatively identified as Rockwall points (Perino 1971:84-85); however, both specimens are damaged, precluding positive identification. Both were found on the surface in the plowed transects. One specimen (FSN 44-1, Figure 35d) is the basal half of an arrowpoint with an expanded stem; long, narrow corner notches; and moderately long, sharp barbs. It is made from a mottled blue and gray chert. The second specimen (FSN 9-1, Figure 35b) is nearly complete, although both barbs are broken. This specimen is rather short, with narrow corner notches and a needle like tip. It is made from an unidentified gray chert.

Untyped side notched: One basal fragment (FSN 79-1, Figure 35e) from the surface of a plowed transect is an untyped side notched arrowpoint made of gray chert. The side notches were wide and shallow. It had either short barbs or prominent shoulders, and the base is straight with sharp corners. This specimen is broken just distal to the side notches, probably by an impact fracture.

Untyped corner notched: Four arrowpoints can be described as cornernotched but are not assigned to a specific type. One (FSN 117-4, Figure 35h) may be typeable but does not fit published type descriptions. All may be variants of the Scallorn type (Bell 1960:84-85). Arrowpoint FSN 117-4 has deep, u-shaped notches producing moderate barbs and a flaring base with sharp corners. It is made from a mottled and banded gray chert. One

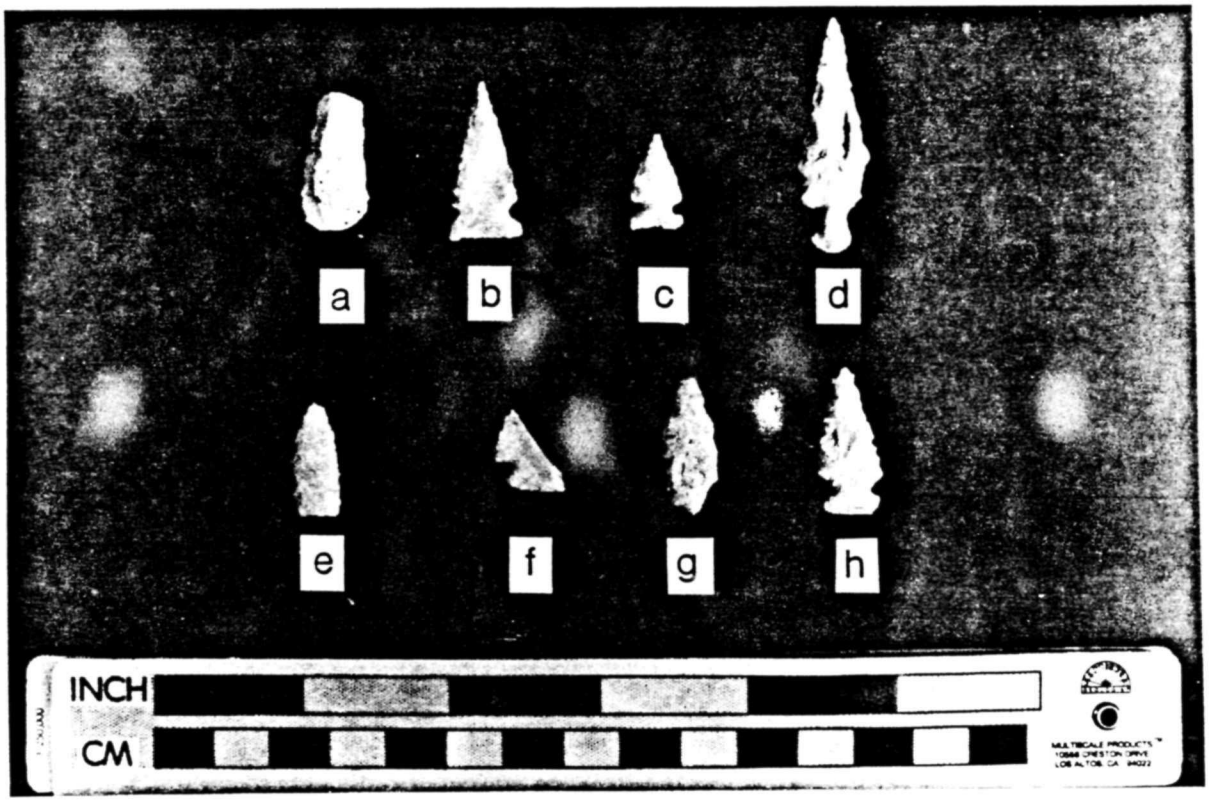


Figure 34. Selected Arrowpoints, 3NW662 (a: arrowpoint preform, FSN 27-1; b: Reed, FSN 29-1; c: Reed, FSN 31-1; d: Untyped Expanded Stem, FSN 37-1; e: Nodena-like, FSN 40-1; f: arrowpoint fragment, FSN 56-1; g: Nodena-like, FSN 75-1; h: Reed, FSN 115-4).

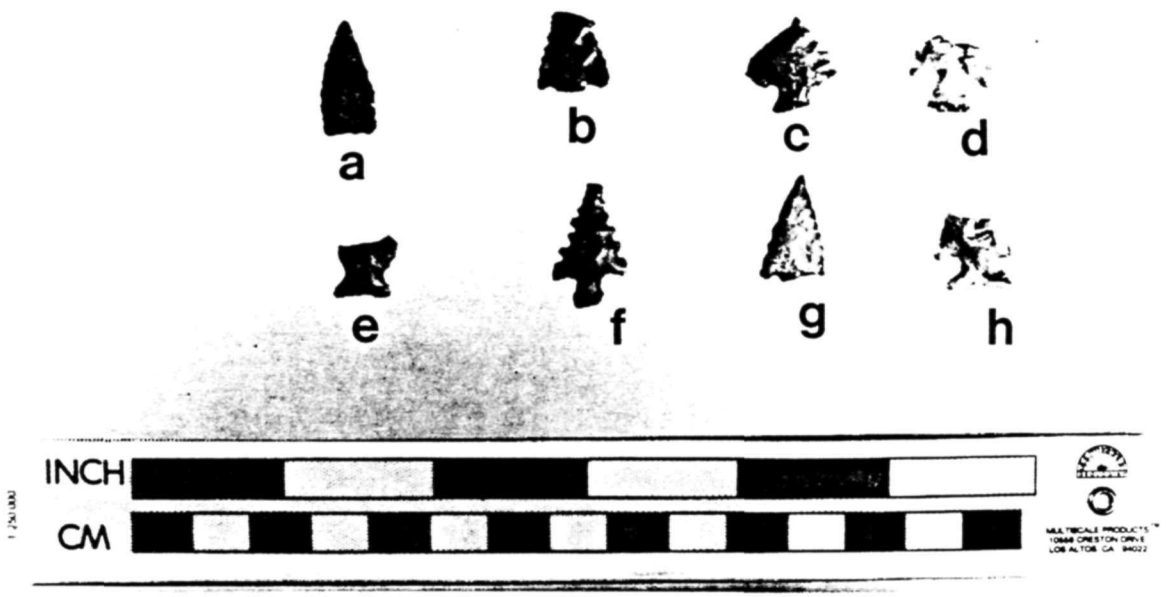


Figure 35. Selected Arrowpoints, 3NW662 (a: Shetley, FSN 3-3; b: Rockwall, FSN 9-1; c: Corner Notched, FSN 18-1; d: Rockwall, 44-1; e: Untyped Side Notched, FSN 79-1; f: Sequoyah, FSN 68-1; g: Untyped Corner Notched, FSN 116-2; h: Scallorn, FSN 117-4).

arrowpoint (FSN 5-1) is made on a Boone chert flake with only minimal secondary flaking. It has a shallow, narrow corner notch on one side and is broken on the other. The base is straight with rounded corners. It is possible that this specimen broke during manufacture. The other two fragments are midsections (one is Pitkin chert and the other is burned gray chert) retaining corner notches but no portion of the base or barbs.

Sequoyah: One specimen (FSN 68-1, Figure 35f), found on the surface of a plowed transect, is a Sequoyah arrowpoint. This specimen, made from an unidentified gray chert, has coarse serrations, slight barbs, and an expanded stem. This type dates from A.D. 1000-1350 (Perino 1968:88-89).

Shetley: One complete triangular arrowpoint (FSN 3-3, Figure 35a) was found on the surface of a plowed transect. This specimen is not really triangular, since its greatest width is about 7 mm above the base. This wide area probably represents the haft since the lateral edge forms a slight angle at that location. The specimen fits the published description of the Shetley type (Perino 1971:92-93), being finely flaked on both faces. However, Dickson (1987:20) cautions against assigning type names to triangular forms in the absence of a good cultural context. This specimen is composed of Pitkin Chert.

Nodena-like: Two elliptical specimens are included in this description. Both were found on the surface of plowed transects and are made of Boone chert. One (FSN 75-1, Figure 34g) is a complete specimen, slightly battered near the base. The second specimen (FSN 40-1, Figure 34c) is probably 75 % complete, missing the proximal end and has been heat treated. These are similar to the published description of Nodena Points (Chapman 1980:310-311; Bell 1958:64-65).

Arrowpoint preform: Specimen FSN 27-1 (Figure 34a) is 75% complete, but missing the distal tip. It has a truncated base and is less finely retouched. This may be a preform for a Nodena or an unspecified type.

Untyped Distal and Medial Arrowpoint Fragments: Five fragmentary specimens are of a size appropriate for arrowpoints, but none retain diagnostic features. Two are made from Pitkin chert, one from Boone chert, one from gray chert and one from a bluish chert.

Untyped Expanded Stem: One aberrant arrowpoint appears to be reworked from a larger projectile point. This specimen (FSN 37-1, Figure 34d) was found on the surface of a plowed transect and is made from Boone chert. Although it fits no published type description, it is similar to both Randolph (Perino 1971:78-79) and Schild Spike (Perino 1971:100-101). The present specimen differs from the Randolph description in having an expanded stem, and this is the same characteristic which makes it similar to the Schild Spike description. While the distal end and the base of

the specimen are apparently reworked, the midsection appears to be an unmodified portion of a larger projectile point.

Projectile Points

Gary: Twenty Gary (Chapman 1980:308) projectile points were collected at the site with 11 from Test Unit 6, 4 from the surface of the plowed transects, 1 from Scrape 6, one from Backhoe Trench 4 (60-70 cm), and 3 from the spring branch (Figures 36 and 37). Of these, 11 are composed of Boone chert, 5 are composed of Pitkin chert, 1 is dark gray chert, 2 are gray chert with mottles, and 1 is greenish brown chert. Seven of the points have very weak shoulders and are nearly bipointed. Six have strong shoulders with right angles and 7 have weak shoulders meaning they are midway between strong and very weak. Four show evidence of heat treating. Seven have been resharpened or reworked at least once. Two exhibit impact fractures.

Untyped Corner/Basal Notched: Two specimens, both found on the surface of plowed transects, are strongly barbed projectile point/knives. The strong barbs have all been broken, but were produced by long, narrow notches originating near the corner of the base. Long stems distinguish these two specimens from the Afton type, although the blade edges are somewhat angular on both specimens. The blades of both are finely retouched, and both have long basal thinning flakes removed from one face. The larger specimen (FSN42-1, Figure 38e), made from Boone chert, has a straight base and very localized edge grinding at the corner of one barb. It also retains much of the original flake surface on one face and is thinly plano-convex in cross section. The small specimen (FSN22-1, Figure 40e), made from Pitkin chert has a slightly convex base with moderate basal grinding and a needle-like distal tip. It is lenticular in cross section. Neither projectile point shows edge damage from use.

Untyped Corner Notched (Straight Base): Four specimens with corner notches and straight bases represent at least two types. The only relatively complete specimen (FSN 1-4, Figure 38a) was found in the spring branch at the north end of the site. This specimen differs from the other three in being predominantly percussion flaked. Extensive edge wear indicates use as a knife and has removed one shoulder. The opposite shoulder is slightly barbed. The other three specimens (FSN 3-1, Figure 38b; FSN17-1, Figure 40c; FSN21-1, Figure 40d) differ from FSN 1-4 (Figure 38a) in being smaller, more finely retouched, and more broadly notched, producing strong shoulders but not barbs. All are broken near mid-blade. Two are made from Pitkin chert and one (FSN 3-1, Figure 38b) from Boone chert, probably heat treated. One of the Pitkin specimens (FSN 17-1, Figure 40c) has light basal grinding.

Untyped Corner Notched (Convex Base): Of three specimens with broad corner notches and slightly convex bases, only one (FSN 16-1, Figure 38d) is complete and probably represents a separate type than the other two. This complete specimen is long and

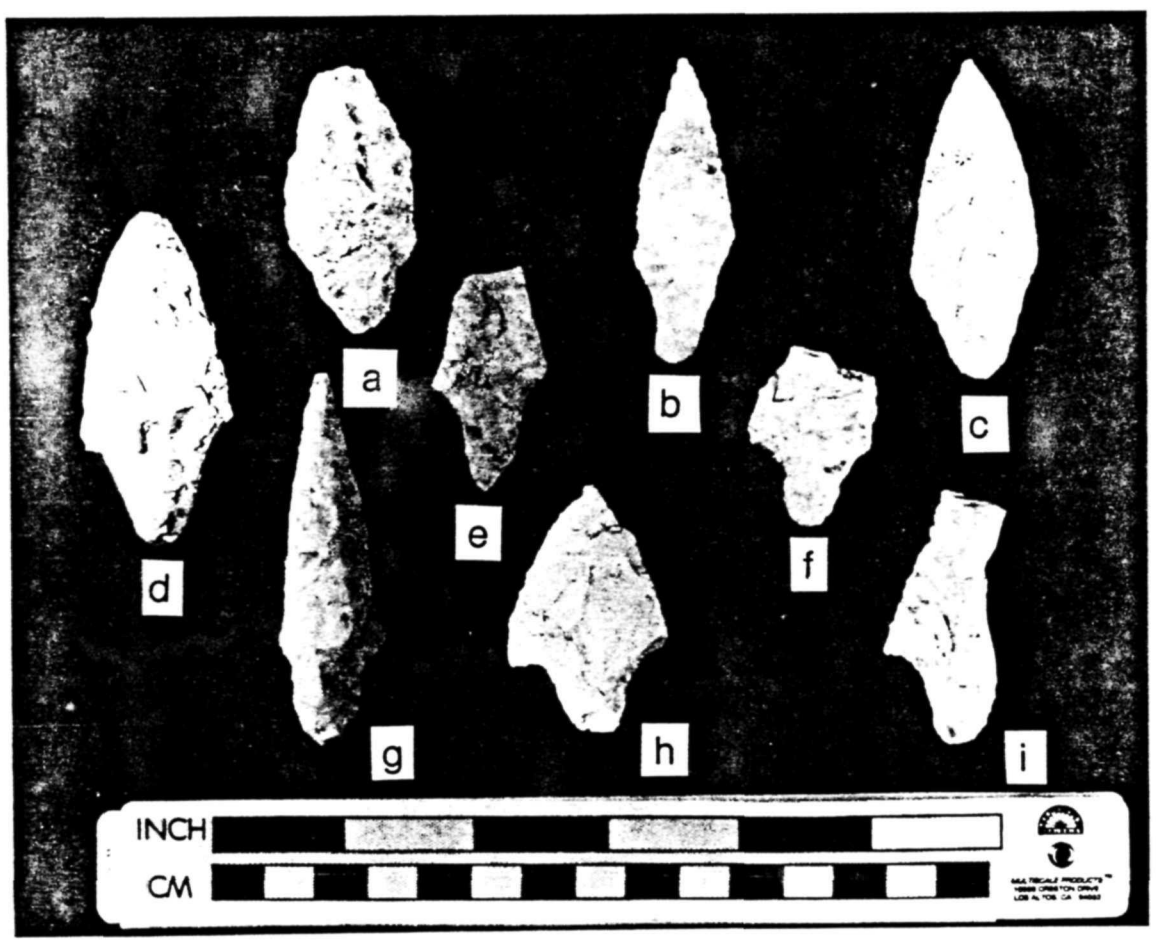


Figure 36. Gary Projectile Points, 3NW662 (a: FSN 1-1; b: FSN 32-1; c: FSN 47-1; d: FSN 67-1; e: FSN 114-1; f: FSN 114-2; g: FSN 117-2; h: FSN 117-3; i: FSN 118-1).

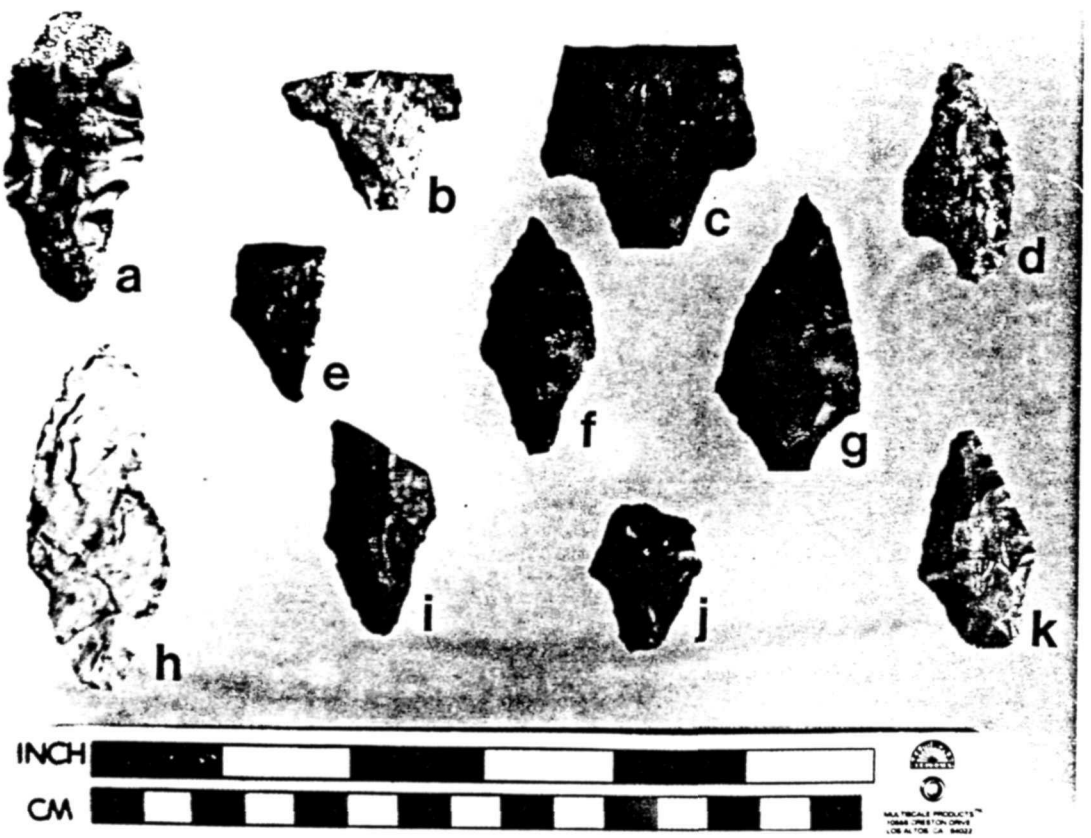


Figure 37. Gary Projectile Points, 3NW662 (a: FSN 1-2; b: FSN 1-3; c: FSN 41-1; d: FSN 46-1; e: FSN 30-1; f: FSN 38-1; g: FSN 116-1; h: FSN 118-2; i: FSN 118-3; j: FSN 121-1; k: 121-2).

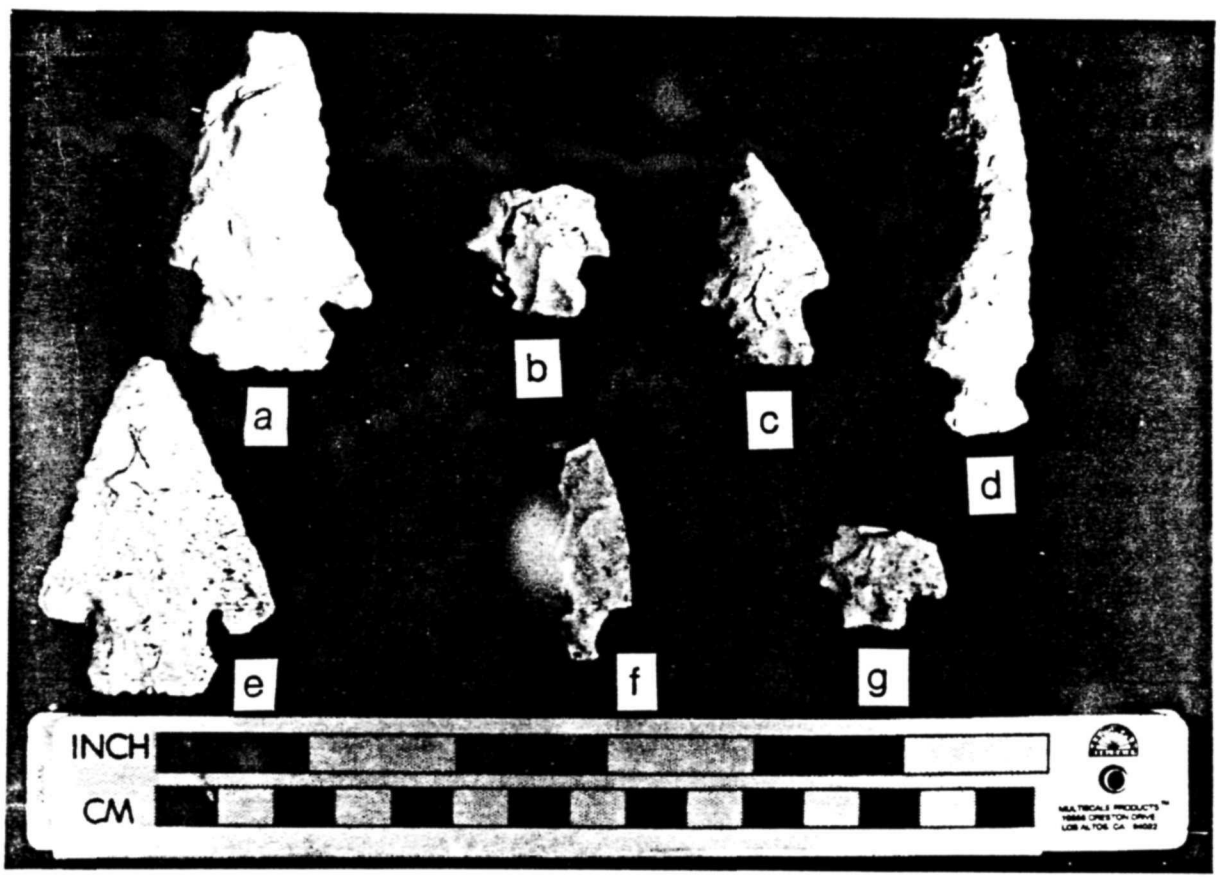


Figure 38. Selected Projectile Points, 3NW662 (a: Untyped Corner Notched, FSN 1-4; b: Untyped Corner Notched, FSN 3-1; c: Untyped Straight Stem, FSN 6-1; d: Untyped Corner Notched, FSN 16-1; e: Untyped Corner/Basal Notched, FSN 42-1; f: Untyped Straight Stem, FSN 83-1; g: Untyped Straight Stem, FSN 130-1).

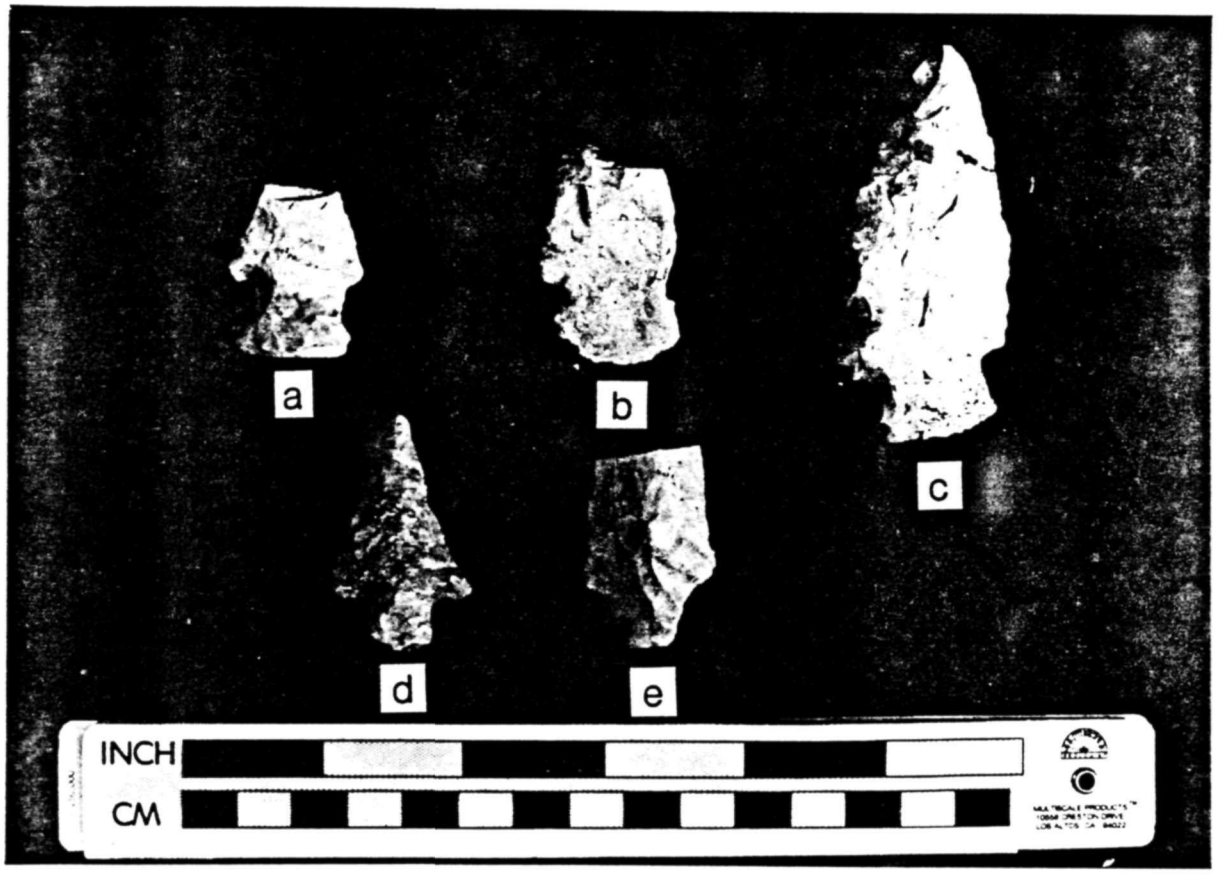


Figure 39. Selected Projectile Points, 3NW662 (a: Untyped Corner Notched, FSN 1-5; b: Untyped Corner Notched, FSN 8-1; c: Untyped Slightly Expanded Stem, FSN 20-1; d: Untyped Straight Stem, FSN 28-1; e: Untyped Contracting Stem, FSN 121-3).

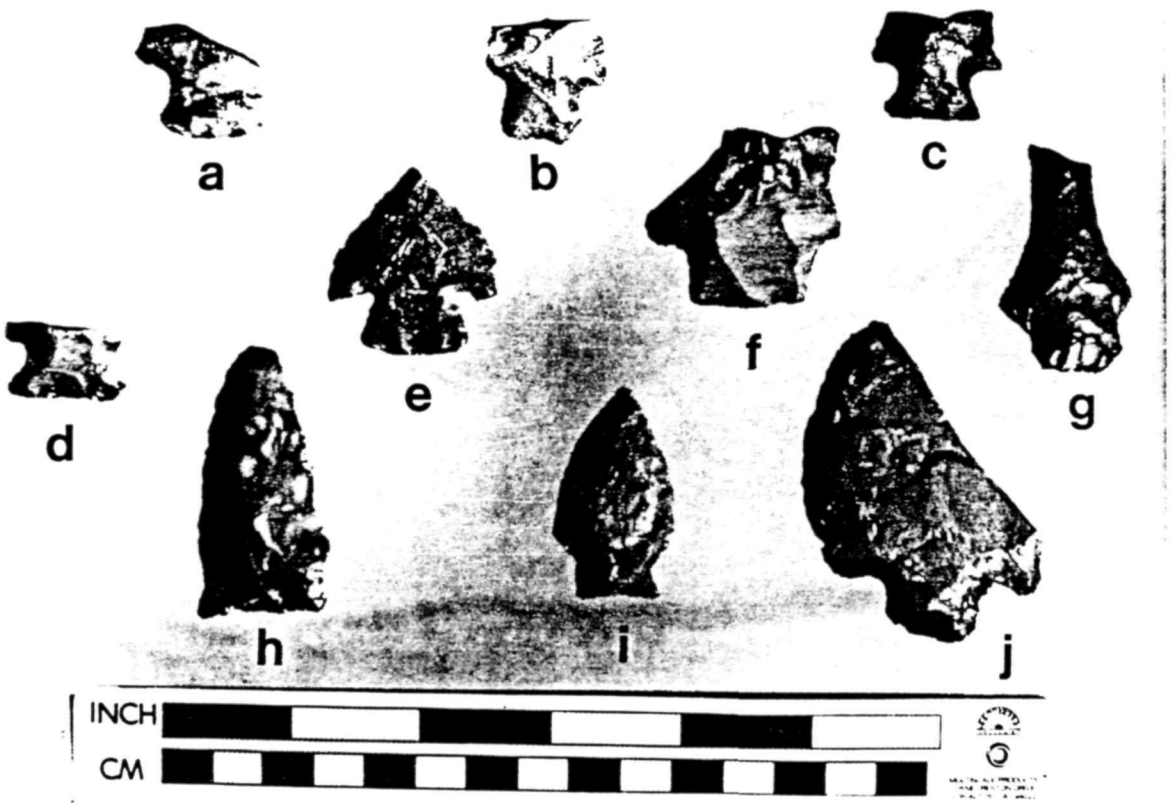


Figure 40. Selected Projectile Points, 3NW662 (a: Untyped Corner Notched, FSN 3-2; b: Untyped Straight to Slightly Expanding Stem, FSN 4-1; c: Untyped Corner Notched, FSN 17-1; d: Untyped Corner Notched, FSN 21-1; e: Untyped Corner/Basal Notched, FSN 22-1; f: Untyped Straight Stem, FSN 23-1; g: Untyped Straight to Slightly Expanding Stem, FSN 36-1; h: Rice Side Notched, FSN 115-1; i: Rice Side Notched, FSN 115-3; j: Notched Preform, FSN 129-1).

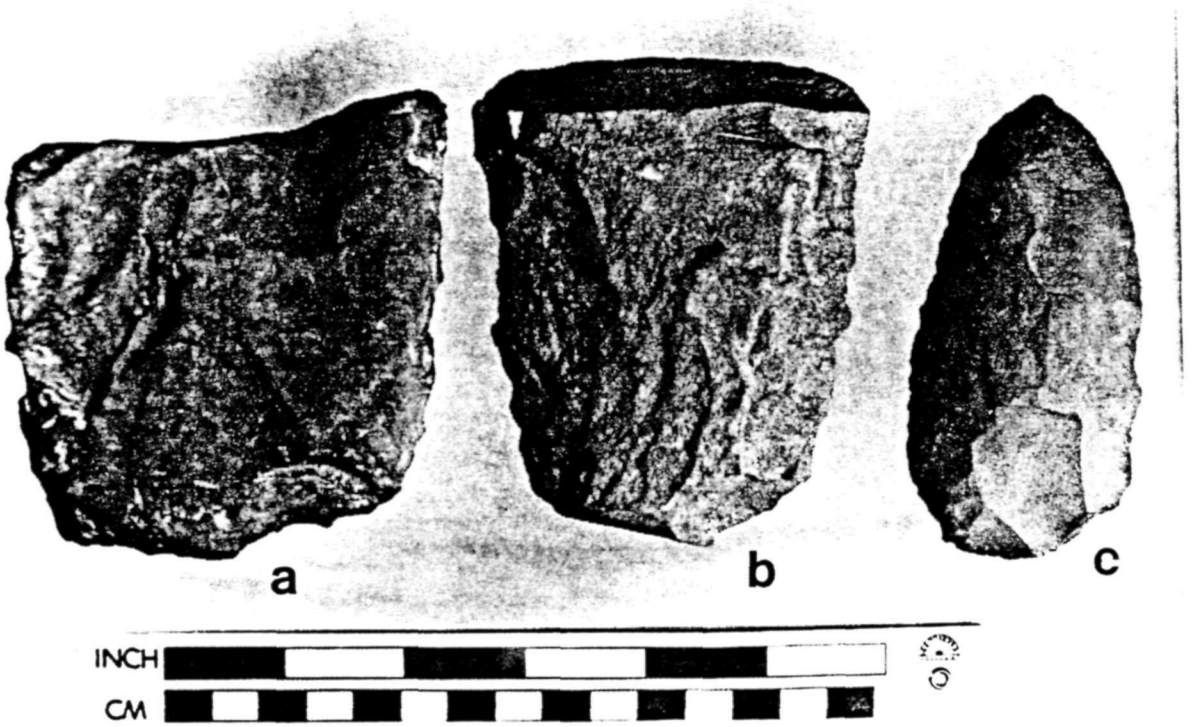


Figure 41. Selected Artifacts, 3NW662 (a: Hoe, FSN 10-1; b: Hoe/ Chopper, FSN 34-1; c: Preform, FSN 43-1).

narrow, resembling the Cupp type (Perino 1971:20-21) except that the base is not as convex and the shoulder not as pronounced as that type. Wear on the stem edges indicates that this was a knife, probably resharpened at least once. It is made from Boone chert, probably heat treated, and was found on the surface of a plowed transect. Two specimens differ from FSN 16-1 in having broader stems and shorter blades, although both specimens are broken. One (FSN 1-5, Figure 39a), found in the spring branch at the north end of 3NW662, is made from unidentified chert that has been thermally altered (indicated by a pot lid near the base). The base of this specimen is only slightly convex and has moderately heavy grinding on the basal edge. It is broken at the distal tip, apparently by an impact fracture. The second fragmentary specimen (FSN 3-2, Figure 40a) is made from an unidentified mottled gray chert. It is broken at the shoulders and one shoulder is missing. The basal edge is moderately ground. It was found in a controlled surface collection in a plowed transect.

Untyped Straight to Slightly Expanded Stem: Seven projectile points are described as having straight to slightly expanding stems. Four are relatively complete, but none can be assigned with confidence to any named type and each specimen may represent a separate type. All but one were found on the surface.

FSN 4-1 (Figure 40b) has a slightly expanded stem with straight stem edges and a straight base. It has prominent shoulders but no barbs. It is broken near mid blade and has a thick cross section. It is made from banded Pitkin chert.

FSN 6-1 (Figure 38c) also has a slightly expanded stem, straight stem edges and a straight base. It too has prominent shoulders but no barbs. It has a small triangular blade with no obvious use wear. It is made from white Boone chert.

FSN 20-1 (Figure 39c) is rather crudely flaked and asymmetrical due to resharpening. It has a slightly expanding stem with straight stem edges and a slightly convex base. It has prominent shoulders, although one is much reduced by resharpening. The resharpening and remnants of use wear on the edges indicate that this was a knife. It is made from a mottled light gray chert, probably Boone.

FSN 28-1 (Figure 39d) has a straight stem with a slightly convex base. It has strong shoulders, one of which is slightly barbed. The blade edges are slightly concave indicating resharpening, and a few steep flakes along the edge may indicate use as a knife. It is made from a highly mottled brown, white and gray chert similar to the Reed Springs variety.

FSN36-1 (Figure 40g) has a slightly expanded stem with recent damage. The base was probably straight or nearly so. The shoulders are weak due to extensive resharpening which has produced a thin, narrow blade, broken distally. It is made from Pitkin chert.

FSN 83-1 (Figure 38f) is a small projectile point, a little larger than an arrowpoint. The narrow stem is nearly straight but is alternately beveled and obviously reworked. The blade edges are convex and a probable impact fracture has removed the distal tip. The small beveled stem suggests that this specimen has been made from a larger point fragment. It is banded white and brownish gray chert, probably Boone and perhaps heat treated. It was found in the upper part of the plowzone in Test Unit 1.

FSN 130-1 (Figure 38g) is the basal fragment of a small projectile point/knife. One shoulder and one corner of the base are sheared off and the distal blade was removed by a bending fracture. All of this damage may have resulted from impact at the distal tip. The remaining shoulder is prominent but not barbed. The base is slightly concave. It is pinkish-white Boone chert, perhaps heat treated.

Untyped Contracting Stem: One specimen (FSN 121-3, Figure 39e) has the general appearance of a Gary type, except that the base is straight. It has a short, contracting stem with weak shoulders. The blade edges are nearly straight and have probably been resharpened. The distal blade is missing. It is made from an unidentified banded and mottled pink chert and was found at 60-70 cm below datum in Test Unit 6. Two Gary points and an untyped arrowpoint fragment were also found in that excavation level.

Untyped Shallow Side Notched: Two specimens, both found near the base of the plowzone in Test Unit 6, have very shallow side notches, very weak shoulders and straight bases. The larger specimen (FSN 115-1, Figure 40h) conforms to descriptions of Rice Side Notched (Chapman 1980:311-312: Kay 1982:500-501); however, Dickson's (1987:19) comments about the validity of this type may be relevant since this specimen appears to be resharpened. It is made from an unidentified gray chert.

The second specimen (FSN 115-3, Figure 40i) is smaller, at the lowest range of the Rice Side Notched descriptions in Kay (1982:501) and has a narrower stem than illustrated examples in Kay (1982:502-503) and Chapman (1980:311). This specimen is made from banded gray and dark gray Pitkin chert.

Both specimens were found in a context suggesting a Woodland or Mississippi date. Diagnostic artifacts in the same excavation level included a Gary base; a Reed arrowpoint; an untyped arrowpoint fragment; and two plain, shell tempered sherds.

CERAMICS

A total of 71 sherds were collected at the site. Of these the majority (67) are shell tempered, three are grog tempered and one is grit tempered. All are plain except for one smoothed over cordmarked grog tempered sherd. This sample represents one of the larger samples of ceramics collected in an open site in the Ozark Mountain Region. Meaningful types cannot be defined until

sites with good context and ceramic samples have been excavated and dated. It is misleading to designate all shell tempered sherds as Woodward Plain and all grog tempered sherds as Williams Plain. Better samples and finer analytic divisions are needed.

Grog tempered sherds: Three grog tempered sherds were collected from test units. Test Unit 2 contained one body sherd (FSN 95-12) with smoothed over cordmarking found between 50-60 cm in a buried Woodland cultural stratum. Two grog tempered sherds were found in Test Unit 6. One rim (FSN 114-29) which is straight with a rounded lip was in the 10-20 cm level. This sherd although predominantly grog tempered has a lesser amount of bone tempering. One body sherd (FSN 118-40) was collected from 50-60 cm. These sherds were between 1.2 and 3.0 cm in length and 1 to 2.8 cm in width. Their thicknesses were .6 to .8 cm.

Grit tempered sherds: One small fragment of a grit tempered body sherd was collected in Test Unit 6 from 80-90 cm bd. This sherd was too fragmentary to measure. This grit tempered sherd was stratigraphically lower and probably earlier than the grog tempered sherd. Both were found in association with Gary projectile points.

Shell tempered sherds: A total of 67 shell tempered sherds were collected at the site in addition to small fragments which are not counted in this sample. Of these, 4 are rims, 2 are bases, and 61 are body sherds. Four were collected on the surface of the plowed transects, one was found in the profile of Backhoe Trench 6, 40 were collected in the middens exposed in the scrapes and 22 were found in the test units.

Three of the rim sherds are small straight fragments with a rounded lip. One is slightly everted with a rounded lip. All are plain in decoration and the shell in each has been leached. Two sherds are .7 cm thick and one is .5 cm thick. Neither of these are complete enough to determine vessel size and form.

Two base sherds were collected. One is flat and square in shape with a .7 cm thick body wall. The other is flat. Both bases are 0.9 cm thick.

The 62 body sherds are all plain and some have eroded surfaces. The shell has not been leached out in three sherds. Thicknesses of the sherds range from .5 cm to .85 cm with the average thickness near .7 cm. Exterior colors are red, buff and tan; and the interior colors are black, red, buff and tan. The largest sherd is 4.4 cm long and 2.4 cm wide, but most are smaller than 2 square centimeters.

SIGNIFICANCE

These descriptions of SPEARS investigations have characterized the nature of the deposits at the Luallen Site and indicated possible avenues of further research. In SPEARS opinion, the site is obviously significant and without doubt eligible for nomination to the National Register of Historic Places. This prehistoric resource is one of the most spectacular open sites recorded in the Buffalo River and in the Ozark Mountain Region of Arkansas. It should be considered as a choice location for a long term program of archeological research and cultural interpretation.

The Woodland and Mississippi deposits identified contain a wealth of information valuable to understanding horticultural and agricultural societies. Well preserved bone and carbonized floral remains collected from the intact middens can supply data necessary to defining the diet, reconstructing the environment, and determining the season or seasons of occupation. Investigations of such data when combined with the information available from bluffshelter excavations will provide a much more complete record of human adaptation through time.

The degree of dependence on agriculture during the Mississippi period is not understood and although cultigens were not positively identified in these test excavations, the presence of carbonized nutshells indicates that preservation is good. With proper data recovery techniques, future discovery of cultigens is possible. Since deposits are stratified, dated cultivated plant remains may lead to understanding where agriculture was practiced in the Buffalo River Region and when it was adopted. Since earlier cultural deposits have been identified below the middens, future research at the Luallen Site should result in a better understanding of cultural changes and adaptations through an even longer period of time.

The presence of human physical remains was not positively verified; however, because of the intensity of the occupation, additional human interments are probable. Known skeletal populations recovered in the Ozark Mountain Region are relatively small and yet information obtained from their scientific study is vast. Human skeletal studies can contribute to defining the quality and length of life, nutrition, biometrics, diseases, genetic characteristics, and demographic changes of populations through time and space.

The high density of cultural materials including diagnostic lithic artifacts collected from intact strata are absolutely necessary to refine the chronology of prehistoric occupation/utilization along the Buffalo River and in the Ozark Mountain Region. Data are present which would assist in separating the Middle from Late Woodland and various Mississippi periods on the basis of lithic assemblages and ceramic technologies. Just how late the site was utilized is not known.

The ceramic sample from these limited investigations represents the highest frequency of pottery recovered on an open site in the Ozarks. Due mainly to poor samples, little is known about the different pottery technologies and their changes through time. Ceramic assemblages are also necessary to understand the Caddoan and/or Mississippian influences in the region and the associated settlement patterns.

Features identified included pits and postmolds. Domestic activity areas, house size and shape, and site patterning could be investigated at the Luallen Site. The pit features identified within the gravel bar represent the first recorded evidence of intensive prehistoric use of gravel bars. Whether these pits, which were filled with well preserved animal bone and charcoal, represent one ceremonial event or are associated with habitation certainly needs further examination. Also, the importance of natural features such as perennial springs to prehistoric habitation is not understood.

The age of the buried cultural strata which are exposed in river bank cuts, backhoe trenches, and test units are as yet unknown. The oldest datable projectile point fragment consists of an Early Archaic type, but it was collected from a disturbed context. The nature of the sediment as analyzed by the project geomorphologist indicates that the river has changed course and moved laterally over much of the flood plain, occupying various paleochannels. It is possible that old land surfaces were not completely destroyed and that early prehistoric components are buried by more recent sedimentation. Continued studies of the landform, deposition of alluvium, and the movement of the river especially at the southern end of the site, should result in determining the best locations for the earliest occupations/utilizations. The potential for buried Paleo-Indian sites should continue to be investigated.

Chapter 7

SIGNIFICANCE TESTING AND THE DISCOVERY OF TWO MIDDLE ARCHAIC PITS AT THE SATTLER SITE (3NW663)

Carol S. Spears

INTRODUCTION

The Sattler Site (3NW663) is situated on a prominent first terrace and the associated flood plain of Moore Creek, a tributary of the Buffalo River. The tract is scheduled for sale to the public. The cultural resources were initially discovered during an archeological survey conducted by Guy Weaver in 1985. His project was accomplished under an agreement between the National Park Service and the Tennessee Valley Authority. A report has not been written, but maps of shovel tests at 30 m intervals on the Sattler tract were examined. Based on the positive shovel tests, the highest density of prehistoric artifacts were found along the fence on the north-south terrace. Lower densities of prehistoric material were found along the terrace edge and in the central part of the flood plain. Historic artifacts were mapped in the southeast portion of the tract.

The site is defined by the artifact distribution in Weaver's shovel tests and the plowed transects accomplished in SPEARS study. It covers the entire tract which is about 30 acres, measuring 420 m N-S x 440 m E-W. On the southern boundary is the Boxley Community Center and graveyard. This area is privately owned and was excluded from this contract. To the north the site is bounded by Moore Creek, to the east is the highway and to the west is a pond and north-south fence (Figure 42).

Significance testing on the Sattler Site was conducted over a period of 9 days between May 4 to 17 , 1988. The majority of the field work was accomplished by Carol S. Spears and Robert A. Taylor who were assisted by Mary E. Pyles during site mapping and test excavations. Investigations at the site included 5 plowed transects, 6 backhoe trenches, 4 scrapes, 3 test units, and site mapping.

Map removed from the electronic edition in
an effort to protect sensitive cultural resources.

Figure 42. Map of the Sattler Site, 3NW663.

The easternmost portion of the site includes a north-south trending terrace projection which has been bisected and partially destroyed by the highway. In an area measuring about 150 m N-S x 100 m E-W, 20 cm of an intact cultural stratum remains beneath the plowzone. Two large prehistoric storage/refuse pits which originate in the cultural stratum were cross sectioned in Backhoe Trench 1. The remainder of the prehistoric storage/refuse pits were excavated by hand. All soil removed was water floated and then waterscreened through fine window screen mesh. Carbonized hickory nut shells were recovered from the pits and samples were radiocarbon dated to the Middle Archaic period. The remainder of the site area contained a low density of prehistoric lithics. Subsurface investigations resulted in finding a limited utilization with buried, stratified deposits in the flood plain of Moore Creek.

The portions of the site containing intact strata and features are extremely important to our understanding of the prehistory of the region. The Sattler Site (3NW663) has a high research potential and is considered significant and eligible for nomination to the National Register of Historic Places.

PLOWED TRANSECTS

Five plowed transects were placed across the site in the alignment required in the Scope of Work (Appendix E). The field was covered in dense fescue and weeds affording little to no ground surface exposure. Surface visibility in the plowed transects was excellent, about 90-95 percent. The distribution of artifacts on the surface of the site is shown in Figure 42. The artifacts observed and collected are listed in Tables 26 and 27. A complete listing of artifacts by provenience on each transect is presented in Appendix D, Table D3. As shown in Figure 42, the highest density of material was in the eastern portion of the site on the high north-south trending terrace projection. The remainder of the artifacts were widely dispersed and occur in low frequencies.

Table 26. Artifacts Collected in Plowed Transects, 3NW663.

Lancelot PP/K	2
PP/K Fragments	4
Preforms	5
Cores	2
Preform Thinning Flake	1

Table 27. Artifacts Observed on the Surface of the Plowed Transects, 3NW663.

FLOODPLAIN	PTA	PTC	PTD	PTE	TOTAL
Flakes	7	1	7		15
Biface			1		1
Lancelot PP/K				1	1
subtotal	7	1	8	1	17

TERRACE	PTA	PTB	PTC	PTD	PTE
Flakes	18	43	10	8	5
Modified Flk				1	1
Bifacial Thinning				1	1
Biface	1		2		3
Preform	1		1	2	4
Core	1	1			2
PP/K Frag		1	1		2
Lancelot PP/K			1		1
Pitted Cobble	1				1
Historic (whiteware)		1			1
subtotal	22	46	15	11	100
TOTAL	29	47	23	12	117

Diagnostic lithic artifacts collected from the surface of the site include two lanceolate and one untyped stemmed projectile point. Measurements of these diagnostic artifacts are presented in Appendix C. The projectile point found on the flood plain near the intersection of Plowed Transect A and Plowed Transect E is a Packard Lanceolate (FSN 13-1; Figure 43b) as defined in Wyckoff (1985). It has a thick diamond-shaped cross section, basal and lateral grinding more than 1/3 its length with the widest measurement at the blade/haft junction. It is basally thinned with multiple short flakes. The distal tip exhibits heavy use (bending flake scars; Cotterell and Kamminga 1987:683), and blade edges indicate it was resharpened at least once. It is made of banded Pitkin chert; most of it is gray and slightly coarse grained while the remainder is black and fine textured.

The other lanceolate (FSN 14-1; Figure 44a) was found on the terrace edge at the north end of Plowed Transect C. It is a basal fragment which is made of white Boone chert and has a slightly concave base with multiple short thinning flakes. Both the base and the slightly concave lateral edges exhibit moderately heavy grinding. Right lateral edges on both faces are beveled. The specimen is broken at the stem/blade juncture. This description conforms to the Breckenridge type (Dickson 1987:17; Perino 1971:12-13) defined from examples described by Marshall (1958: transitional forms SN226 and SN136).



Figure 43. Projectile Points, 3NW663 (a: Untyped Stem, FSN 34-1; b: Packard Lanceolate, FSN 13-1).

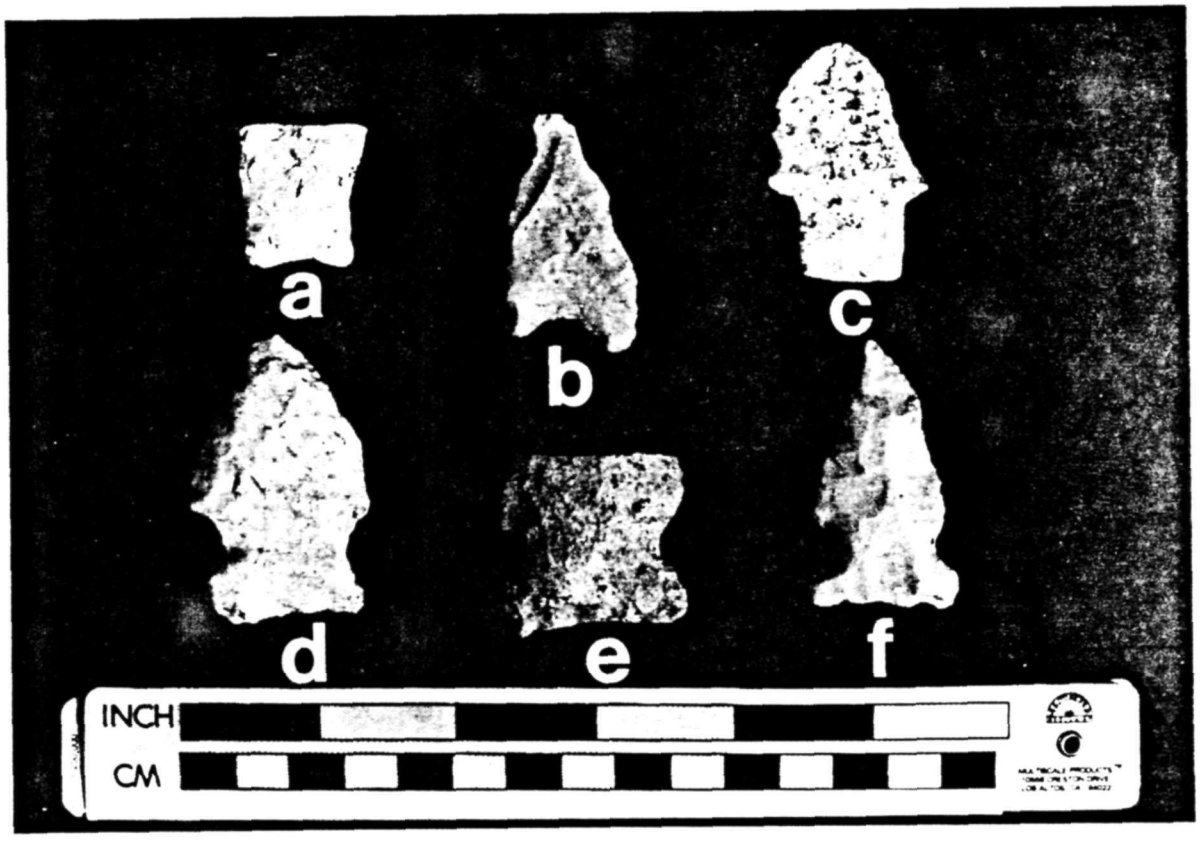


Figure 44. Projectile Points, 3NW663 (a: Lanceolate, FSN 14-1; b: Lanceolate, FSN 25-2; c: Stone Square Stem, FSN 45-1; d: Big Sandy, FSN 72-1; e: Big Sandy, FSN 44-1; f: Side Notched, FSN 25-1).

The untyped stemmed projectile point (FSN 34-1, Figure 43a) was collected from the middle of Plowed Transect D in the flood plain. This specimen appears to have been a late stage preform for an untyped side notched or corner notched projectile point with a straight base. Although the base is finely retouched, the blade exhibits random percussion flaking. The distal blade has been broken transversely and is steeply retouched from use as a scraper. This tool was probably hafted, considering the finished base; and it may have been hafted differently than if it had been a projectile point since both shoulders have been removed, perhaps intentionally, by bending fractures. It is made from a lightly mottled gray chert.

Subsurface investigations were accomplished in the vicinity of these diagnostic artifacts and in other areas where artifacts clustered. In Plowed Transect C there was a burned area containing charred wood and burned clay which was further investigated by Scrape 2. Toward the end of the project after hard rains, most of the plowed transects were re-examined for additional tools or diagnostic artifacts but none were found.

BACKHOE TRENCHES

A total of six backhoe trenches were excavated at the site (Figure 42). Three of these were positioned on the upper terrace and three were placed on the flood plain perpendicular to Moore Creek. All of these trenches were examined by Dr. Margaret J. Guccione, the project geomorphologist. The results of her research are presented in Chapter 2. Measurements of the backhoe trenches are presented in Table 28. The Middle Archaic pit features were exposed in Backhoe Trench 1.

Table 28. Measurements of Backhoe Trenches, 3NW663.

BACKHOE TRENCH	LENGTH (m)	DEPTH (m)
1	7.0	1.4
2	2.5	1.4
3	5.0	1.1
4	3.4	0.9
5	5.6	1.6
6	3.2	1.3

Backhoe Trench 1 and the Two Middle Archaic Pits

As the designation implies, Backhoe Trench 1 was the first subsurface unit placed in the site. As it was being excavated a high density of material was evident in each scoop of dirt. When two large grindstones (FSN 17-1 and 17-2) were removed in successive bucket fulls, digging was halted and the trench profile examined. At this time, it was determined that a thick midden or deep pit had been found. The location and position of one of the grindstone was identified by an impression in the wall, but it was not possible to determine if the grindstone was right side-up or up-side down. This projection was flagged and the backhoe operator was instructed not to disturb it further and to move the bucket one width to the north and continue digging. Once the trench was enlarged, and no additional deep anthropic sediments were observed, it was determined that the features were two localized pits separated at the top by two grindstones.

Both the north and south wall profiles of Backhoe Trench 1 were cleaned, photographed, and drawn (Figures 45 and 46). Artifacts collected in the profiles and in the backdirt are listed in Table 29. In the North Wall the plowzone level was distinguished from a more developed sediment which is an intact stratum. At the east end of the trench, there is a swale containing similar sediments and artifacts as the cultural stratum. This swale was also evident in Test Unit 1 which was positioned just northeast of Backhoe Trench 1.

Table 29. Artifacts Collected in Backhoe Trenches, 3NW663.

Abbreviations Used: R=PREFORM; PC=PITTED COBBLE; UF=UTILIZED FLAKE; C=CORE; PFL=PRIMARY DECORTICATION FLAKE; SFL=SECONDARY DECORTICATION FLAKE; IFL=INTERIOR FLAKE; FLKF=FLAKE FRAGMENT; PT=PREFORM THINNING, BT=BIFACIAL THINNING; PF=PRESSURE FLAKE; FCR=FIRE CRACKED ROCK; UM=UNMODIFIED ROCK; CL=CULTURAL LEVEL; PZ=PLOWZONE.

LOCATION	R	PC	UF	C	PFL	SFL	IFL	FLKF	PT	BT	PF	FCR	UM	TOTAL
BH1 N Wall CL							3	3						6
BH1 N Wall F/swale							1	3						4
BH1 S Wall CL	1						2							3
BH1 Backdirt	9	1	2	8	5	2	56	66	6	2		6	17	188
BH3 W Wall PZ							1							1
BH5 W Wall 60-80							3							3

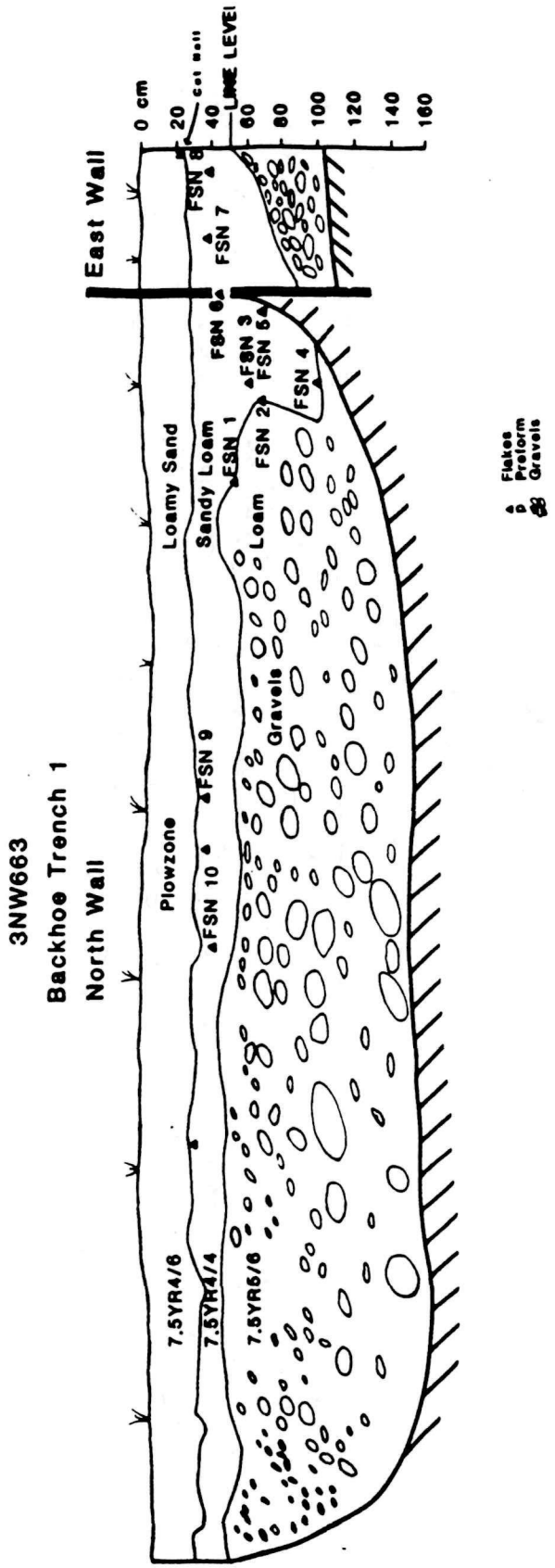


Figure 45. North Wall Profile of Backhoe Trench 1, 3NW663.

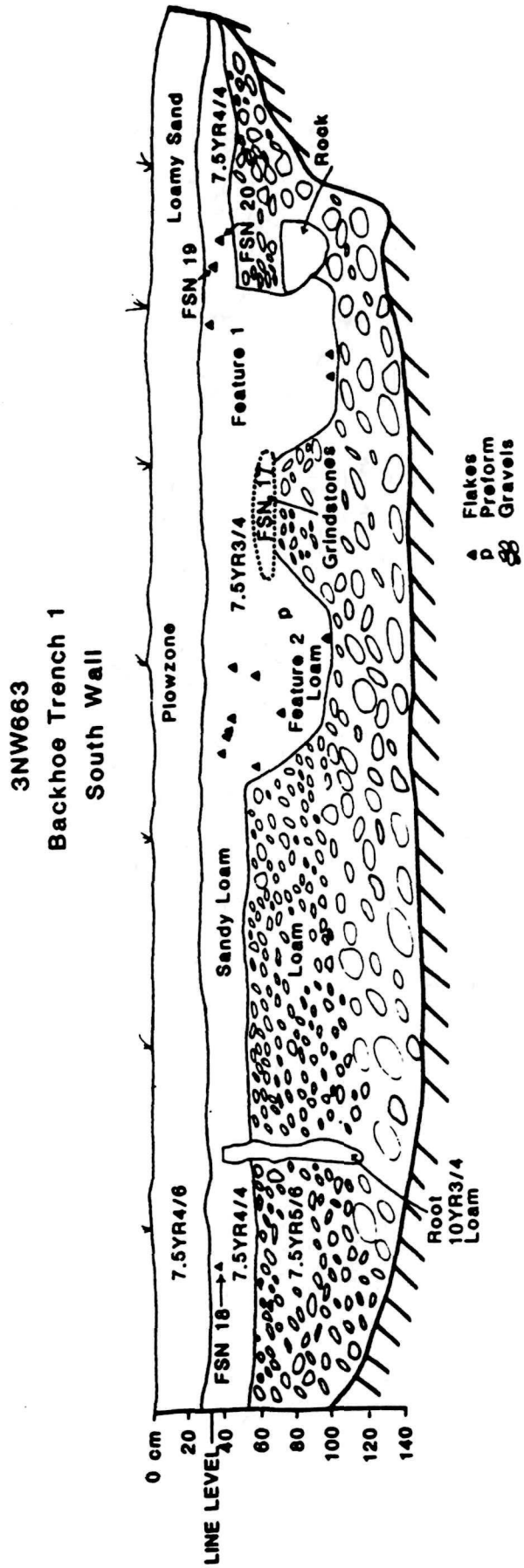


Figure 46. South Wall Profile of Backhoe Trench 1, 3NW663.

In the South Wall are the two pits designated as Features 1 and 2. The one grindstone and probably the second were situated between the two features. The pits are basically similar in size, depth, and fill. The profile since it was stepped by the backhoe was excavated back by hand to a flat wall. This was accomplished by initially excavating the loosely compacted dark brown (7.5YR3/4) loam fill of the features in 10 cm levels and then cutting the surrounding sterile matrix area back. All sediments in each level of the features were water floated and waterscreened through window size mesh. There was no evidence that the fill in the refuse pits was stratified.

The backhoe with a scraper blade attachment removed the backdirt pile and the plowzone from an area measuring about 4 meters square above the features. With the plowzone removed and the base hand scraped, the tops of the pits were not visible. Another two centimeters were carefully scraped by machine blade (an attachment invented by Dr. Robert H. Lafferty, MCRA) and then by hand until the feature stains became visible. Once exposed, the top of the pits were troweled, pit surface outlines mapped, and the new wall profile drawn (Figure 47). The remainder of each pit was hand excavated as one provenience.

All fill was water floated and waterscreened through window size mesh. The majority of the lithic artifacts were removed as the features were excavated and the rest were recovered at the water screen or sorted from the heavy fraction at the lab. In order to summarize the feature contents, all the provenience units have been lumped together. The artifacts collected in the pits are listed in Table 30. The base and sides of the features are formed by naturally occurring sandstone cobbles and gravels with some clasts over 40 cm. The fill in the pits included many pieces of natural rock and sandstone, but only a small sample of this stone was collected.

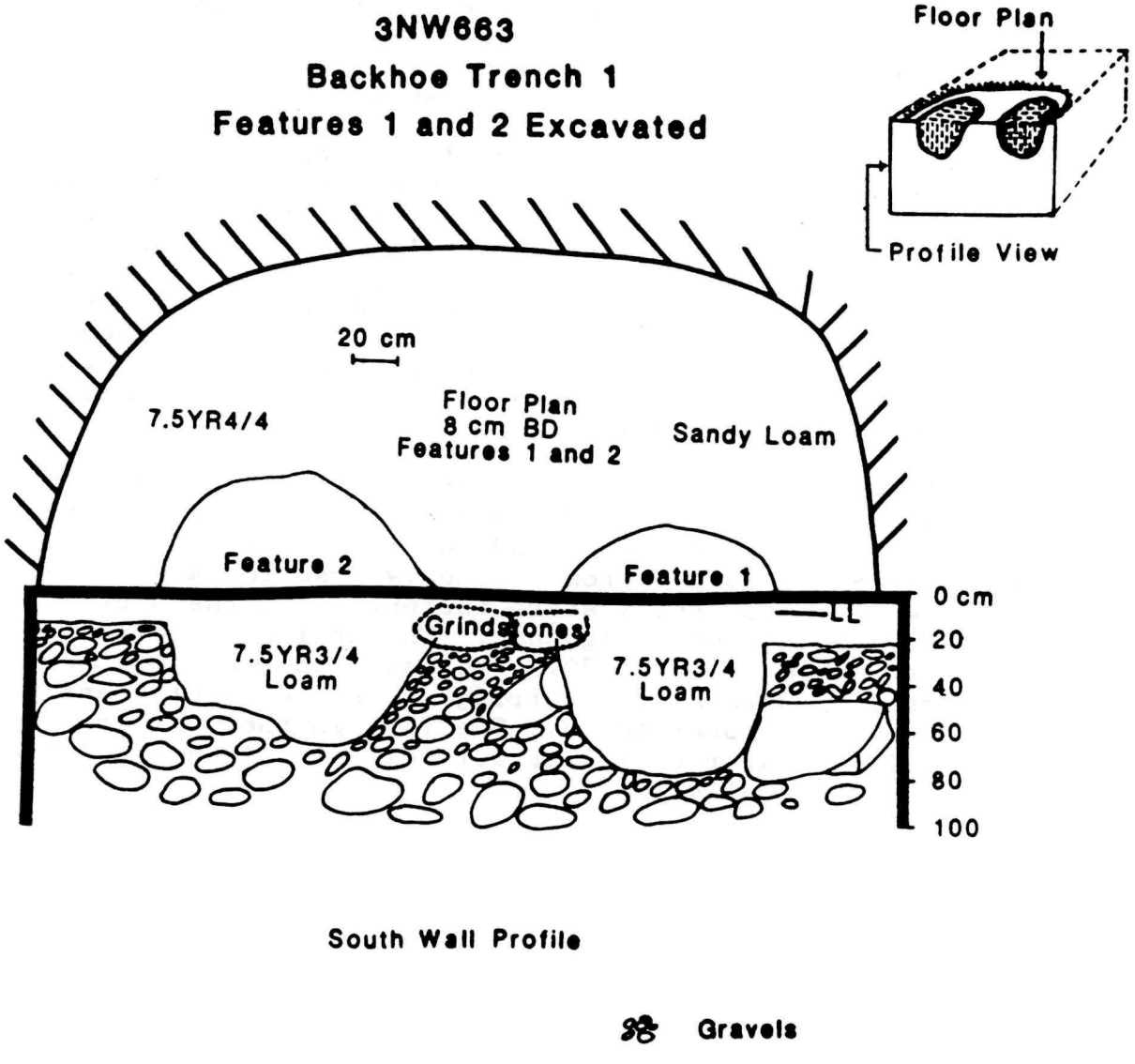


Figure 47. Floor Plan and Profile of Features 1 and 2 after Excavation, 3NW663.

Table 30. Artifacts Collected in Features 1 and 2, 3NW663.

	FEATURE 1	FEATURE 2	TOTAL
SIDE NOTCHED PP/K	1		1
PP/K FRAGS	2	3	5
BIFACE	1		1
PREFORM	4	8	12
HAMMERSTONE		2	2
PITTED COBBLE	3	3	6
UTILIZED FLAKE	2	4	6
PAINTSTONE/CHOPPER	1		1
CORES & FRAGS	3	3	3
PRIMARY DECORT		8	8
SECONDARY DECORT	24	11	35
INTERIOR FLAKE	247	466	713
FLAKE FRAGMENTS	479	785	1264
PREFORM THINNING	42	91	133
BIFACE THINNING	2	13	15
PRESSURE FLAKE	61	48	109
FIRECRACKED ROCK	58	62	120
UNMODIFIED STONE	62	80	142
total	992	1587	2579
HICKORY NUTSHELLS (GRAMS)	24.22	36.7	60.92
BLK. WALNUT (GRAMS)	.7		.7
CARBONIZED WOOD	x	x	x
total (GRAMS)	24.97	36.7	61.62

One projectile point found in Feature 1 (FSN 72-1, Figure 44d) conforms to the description of the Big Sandy type (Chapman 1975:242; Bell 1960:8-9) although a number of similar side notched types have been named. Most Big Sandy types date to the Middle Archaic period (Dickson 1987:19). Charred nuthulls collected from Feature 1 were radiocarbon dated to 4420-4925 B.C. (Beta-26213, corrected, Klein et al. 1982). This side notched point is composed of heat treated Boone chert and has moderate grinding on the base and heavy grinding in the side notches. It also has edge damage on the blade, indicating use as a cutting tool. The remainder of the projectile point fragments collected from these two features are too small and fragmentary to be associated with a type.

The grindstones (FSN 17-1, 17-2) are both composed of sandstone. FSN 17-1 measures 47 x 32 cm and is 8.5 cm thick. The primary use area is oval shaped measuring 20 cm long and 13 cm wide. This depression is 1.5 cm deep. The entire face of this grindstone is heavily pecked and battered and does contain one small u-shaped pit. The other grindstone (FSN 17-2) is

larger and its utilized surface is not heavily battered. It measures 54 x 30 cm and is 13 cm thick. The use area is 16 x 11 cm and the depression is 1.3 cm deep. The basal portion at one end of this stone has been burned. Both are composed of sandstone and have not been intentionally shaped. Large stationary tools such as grindstones have been found in higher frequencies dating from the Early and Middle Archaic in Rogers Shelter in the Missouri Ozarks (Robinson 1982:319).

Manos were not observed in association with the grindstones. They may have been removed with the backhoe. It is also possible that the nuts may have been cracked, pounded, pulverized or ground with wooden tools which have not been preserved. Six pitted cobbles were collected in the features and replication experiments have shown that u-shaped pits result on the cobble faces when nuts are cracked (Spears 1975).

The grindstones do not contain evidence of hematite or limonite on their surfaces. However, one crude paintstone\chopper like tool was collected in Feature 1. It was composed of a clay ironstone-like substance with both faces exhibiting scratched and smoothed surfaces. Two edges had been chipped and the overall shape the tool resembles a chopper. Two additional pieces of hematite were collected from Feature 2. A principal components analysis of the ground stone assemblage from Rogers shelter resulted in factors which clearly associated pigment processing tool kits with the Early and Middle Archaic horizons (Kay 1982:342).

Feature 2 contained a higher frequency of artifacts, which is also an indication that less of this pit was destroyed by the backhoe and more of it was hand excavated and floated (Figure 47). Roughly one-half of Feature 2 was recovered, and only about one-third of Feature 1. A higher frequency of Pitkin chert and siltstone in Feature 2 was observed during excavation and the frequencies are presented in Table 31. Most of this material was debitage waste from the reduction and probable manufacture of one or a few tools. Many are small flake fragments, pressure flakes and abrasion material. It is likely that reduction material from one core could be fitted together.

On the whole, charred nutshells from Feature 2 consisted of larger fragments. In this feature, 200 pieces weighed 8 grams. In Feature 1, 280 specimens weighed 8.05 grams. These samples were sent to Beta Analytic Inc. for radio carbon dating. The date obtained from Feature 2 was 4740-5240 B. C. (Beta-26214, corrected, Klein et al. 1982).

While in the field, the pH for sediments in the features was measured using a Hellige-Trog pH test kit. Sediments at 40 cm bd from Feature 2 had a pH between 6 and 6.5. Feature 2 was not nearly as acidic as sediments taken from 50-60 cm bd in Feature 1 which had a 4.5 pH. This difference may account for the larger fragments, i.e. better preservation, of hickory nutshells found within Feature 2.

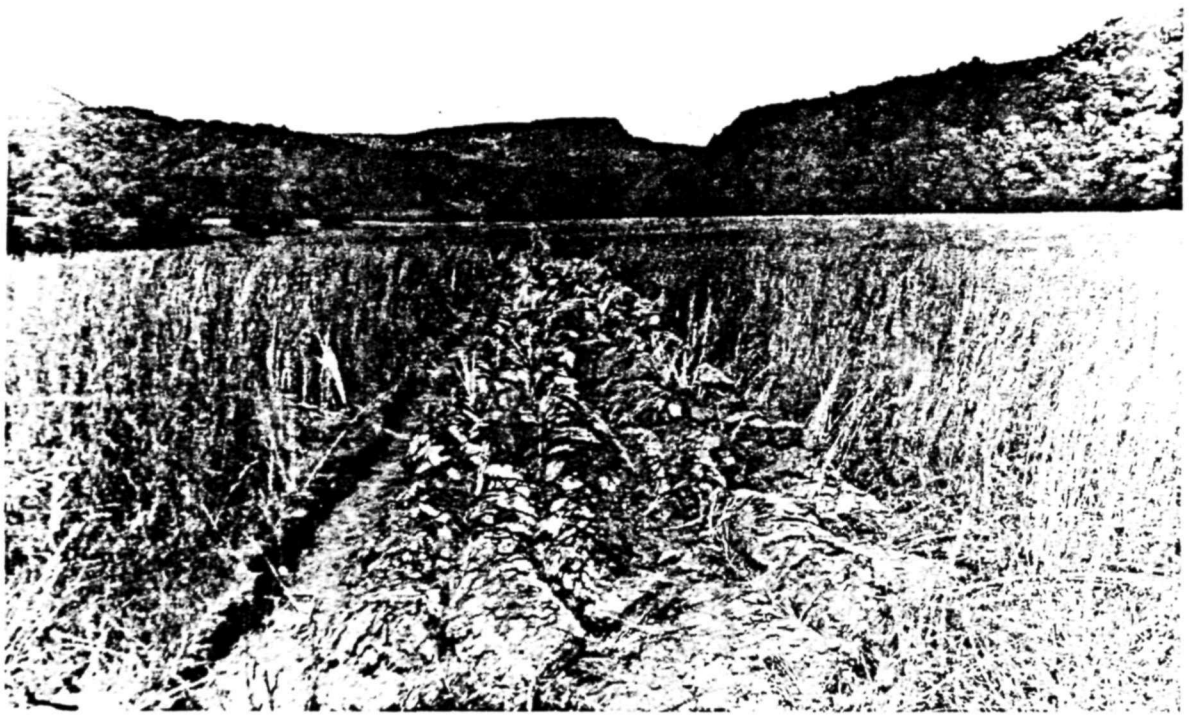


Figure 48. High Density of Artifacts in Plowed Transect A, 3NW663.

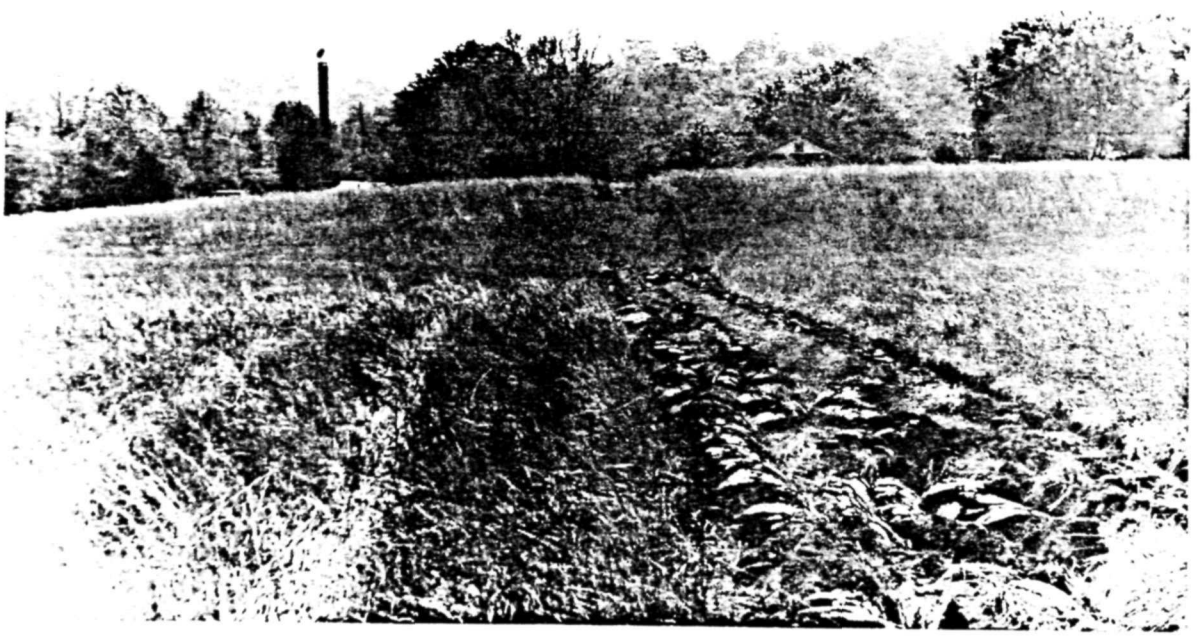


Figure 49. Prominent Terrace from Plowed Transect A in the floodplain, 3NW663.



Figure 50. Profiles of Features 1 and 2 in Backhoe Trench 1, 3NW663.



Figure 51. Top View of Features 1 and 2, 3NW663.

There are differences between the contents of the two pits which, behaviorally speaking, are indications that slightly different activities occurred. The byproducts of these activities were discarded at different times but during the same cultural stage.

Table 31. Frequency of Raw Material, 3NW663.

Abbreviations Used: CH=CHERT; AND SILTS=SILTSTONE.

	BOONE		PITKIN		OTHER CH		SILTS		SANDSTONE		OTHER	
	ct	%	ct	%	ct	%	ct	%	ct	%	ct	%
FEA 1	721	72.7	147	14.8	104	10.5	13	1.3	6	0.6		
FEA 2	892	56.2	479	30.18	110	6.9	101	6.4	3	0.2	2	0.1
ENTIRE SITE	3021	71.8	739	17.6	311	7.4	122	2.9	12	0.3	3	0.1

The two prehistoric pits initially were constructed primarily for the storage of hickory nuts and black walnuts. Black walnut remains were limited to one fragment collected in Feature 1 (Table 30). The largest sample of nuts collected at Rogers Shelter were hickories and black walnuts which had the highest frequency of occurrence in strata dating to the Middle Archaic (Parmalee et al. 1976:142; McMillan 1976:213).

It was a labor intensive task for the prehistoric hunters and gatherers to dig the large storage pits into the surrounding densely packed gravel bar. No evidence of the digging tools used was observed. There was no evidence that the pits were lined with clay or basketry and there was no evidence for in situ burning. Parching nuts not only makes the nuts easier to crack, but it stops germination and destroys insect larvae, activities which are required prior to long or short term storage. The pits may have been sealed from vermin and marked in order to be relocated at a later date. The grindstones, which have been shown to be long-term use tools (most likely reused in successive seasons) (Spears 1985), could have marked the pits. However, if this is true, then the abandoned grindstones and the features found represent one of the latter seasons of occupations or are an indication that these stones were later lost to persons utilizing the site for similar functions.

The nuts most likely were gathered in this vicinity, because such a large volume of food would probably not have been transported great distances. Species identification from the charred remains was not conducted, but the species which could have grown in the vicinity are listed in Table 32. A few fragments of wood

charcoal which were found in the pits have yet to be examined. Some native tree species have been identified from archeological contexts at Erbie, which lies downstream from Boxley. Shagbark hickory nutshells and acorns were found in Late Archaic contexts (Lopinot 1988:195-197). Acorns, black walnut, hickory, and hazelnut shells were identified from features associated with the Mississippi period (Lopinot 1988:171-173).

Unlike acorns, which take two years to mature, hickories and walnuts produce a crop each year that averages one to three bushels per tree (King 1976:265; USDA 1948, 1965). White hickory (also commonly called mockernut yield on the average 1.5 to 2 bushels a year. Shagbark hickories average 2 to 3 bushels; black walnut trees produce about a bushel per tree (USDA 1948, 1965; King 1976:264. Yields are affected by a number of factors including the age and size of the tree and the forest density. In general, high yields occur every 2 to 3 years. Trees in an open forest produce more than trees in a closed canopy forest. Some trees reach peak production early in life and produce less as they get older and some trees maintain a constant production rate throughout life. Other factors such as disease and insects also affect nut productivity (King 1976:264-265).

Table 32. Varieties and Occurrence of Hickory and Black Walnut Trees in the Ozarks (Fowells 1965; Braun 1967; Hilliard 1986).

Abbreviations Used: h=hickory; d=dominant location among nut bearing species; c=commonly occurring species; x=probable occurrence but not favored habitat;o=infrequent location;-=usually not found in this location; C=*Carya*; J=*Juglans*.

Scientific Name	Common Name	Moist Slopes	ridge-tops	Dry slopes	Valley	Overflow Areas
C. cordiformis	bitternut h	o	-	-	o	-
C. ovata	shagbark h	c	o	-	c	-
C. laciniosa	shellbark h	-	-	-	-	x
C. tomentosa	mockernut h	d	x	o	d	-
C. texana	black h	o	x	c	-	-
C. glabra	pignut h	o	x	x	o	-
J. nigra	black walnut	c	-	-	c	x

Hickory and Black Walnuts ripen between September and October (Miller 1972:38-39). They are gathered and stored in the fall and then used as food sources and supplements in the following seasons.

Comparison of the food value of hickory and black walnuts are shown in Table 33. Preservation may account for the lack of other types of nuts and foodstuffs being present. The relatively thick hulled hickory nuts are more conducive to being charred and subsequntly preserved than thin walled seeds and nuts which would more readily turn to ash (Parmalee et al. 1976:142).

Table 33. Comparative Food Values of One Pound (435 grams) of a Sample of Food Sources Available in Winter Prehistorically (Reed and Davidson 1954:392; Spector 1956:187, 190).

	Protein %	Fats %	Carbohydrates %	Calories ct
Hickory Nuts	15.5	67.4	11.4	3495
Black Walnuts	27.6	56.3	11.7	3105
Acorns	37.4	37.4	48.0	2718
Pecans	11.0	71.2	13.3	3633
Rabbit	16.0	6.0	0	553
Turkey	20.1	20.2	0	1215
Deer	20.0	6.0	0	634

Preparation of hickory nuts involves cracking, extracting and eating the nutmeats. There are other accounts that the nutshells were probably parched in open fires, cracked, ground, or pulverized on grindstones. The nutshells and nutmeats were then thrown in a boiling pot and the oils and nutmeats were skimmed or strained off and used to flavor, enrich and thicken broth (Catesby 1731-1743, Vol.2:x; Swanton 1946:259-260; Bartram 1792:38).

Charring could have resulted from the parching process or from subsequently being used to fuel a hot fire. The charred nutshells were then discarded into the storage pit along with other refuse which had accumulated from activities conducted in the vicinity. The pits did not contain any evidence of stratification and it is assumed that they were filled in a short period of time. This hypothesized behavioral sequence, if true, would mean that similar pit features in addition to hearths probably exist on this same landform.

Hickory nuts are seasonally abundant, nutritious and can be stored easily. They offer a food source which when combined with other food sources offers a relatively stable subsistence base for small populations (Asch et al. 1972:26; Hilliard 1980:14).

Backhoe Trenches 2

Backhoe Trench 2 was placed on the highest terrace in the tract (Figure 42). As the profile indicates, directly beneath the plowzone were culturally sterile gravels which increased in size with depth. Only one Pitkin flake was observed in the plowzone (Figure 52).

Backhoe Trench 3

Backhoe Trench 3 was placed toward the edge of the first terrace (Figure 42). Artifacts were found within the plowzone. No artifacts were observed in the dips noted in the profile (Figure 53). The sandy loam at the north end of the trench and toward the terrace edge is interpreted as a natural thickening of sediments from overbank deposits or filled in swales. Swales were verified in Test Unit 1.

Backhoe Trench 4

Backhoe Trench 4 was positioned in the flood plain of Moore Creek (Figure 42). No artifacts were observed in this profile (Figure 54).

Backhoe Trench 5

Backhoe Trench 5 was excavated in the flood plain and alluvial deposits extended almost 1.2 m to the basal gravels (Figures 42 and 55). Three flakes were found at about 70 cm bs near the contact of two slightly different sediments. Because of the possibility for deeply buried cultural deposits, Test Unit 3 was positioned in this vicinity.

Backhoe Trench 6

Backhoe Trench 6 was placed in a relatively low area near the location of a lanceolate projectile point found in Plowed Transect E (Figure 42). It contained less alluvium and basal gravels were only 80 cm below the surface (Figure 56). No artifacts were observed in this profile.

SCRAPES

Four scrapes were excavated at the site (Figure 42). All of these were positioned on the upper terrace where sediments were thinner and there was a greater likelihood of exposing features below the plowzone. The measurements of the area cleaned in each scrape are listed in Table 34. Artifacts and an intact cultural zone were observed in Scrape 1.

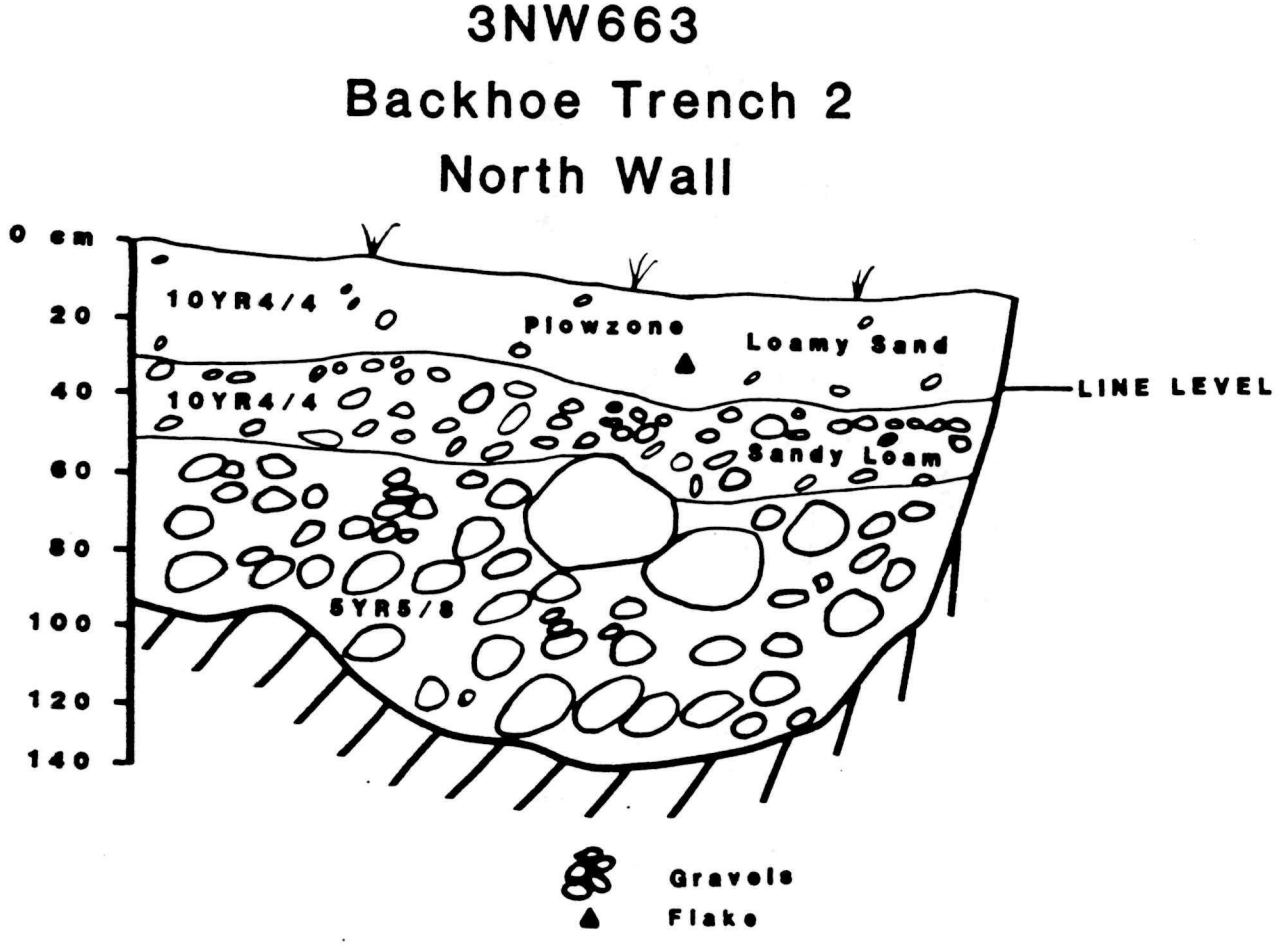


Figure 52. Profile of Backhoe Trench 2, 3NW663.

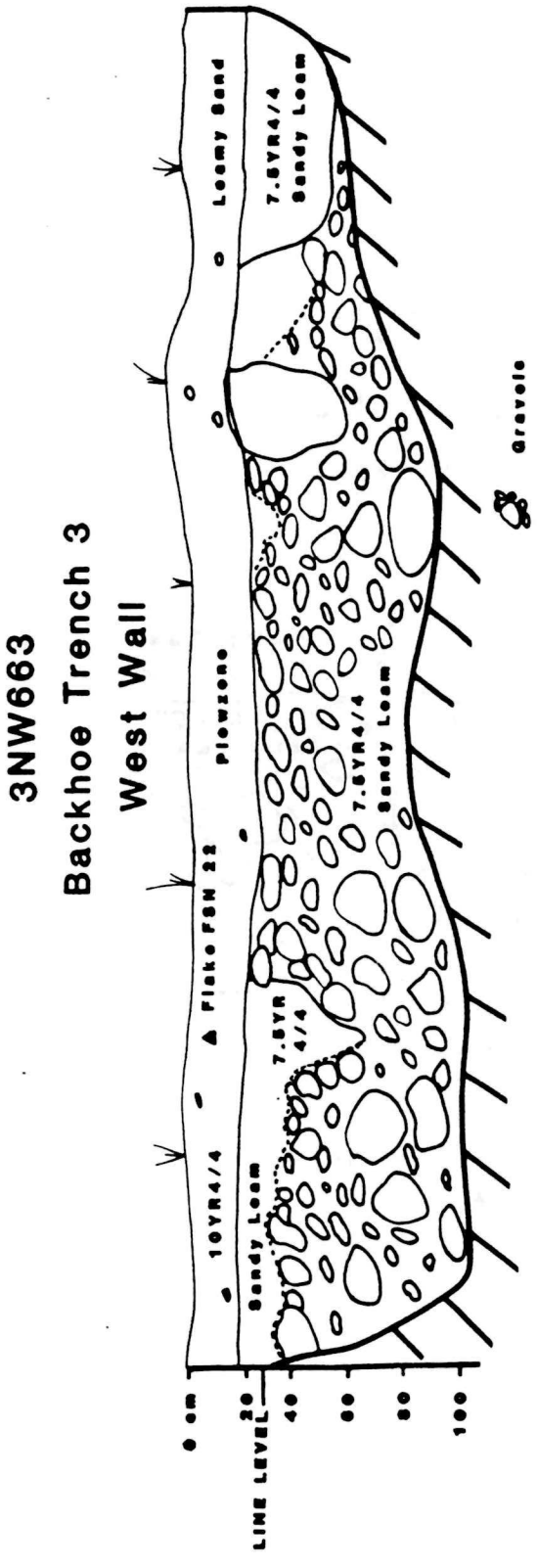


Figure 53. Profile of Backhoe Trench 3, 3NW663.

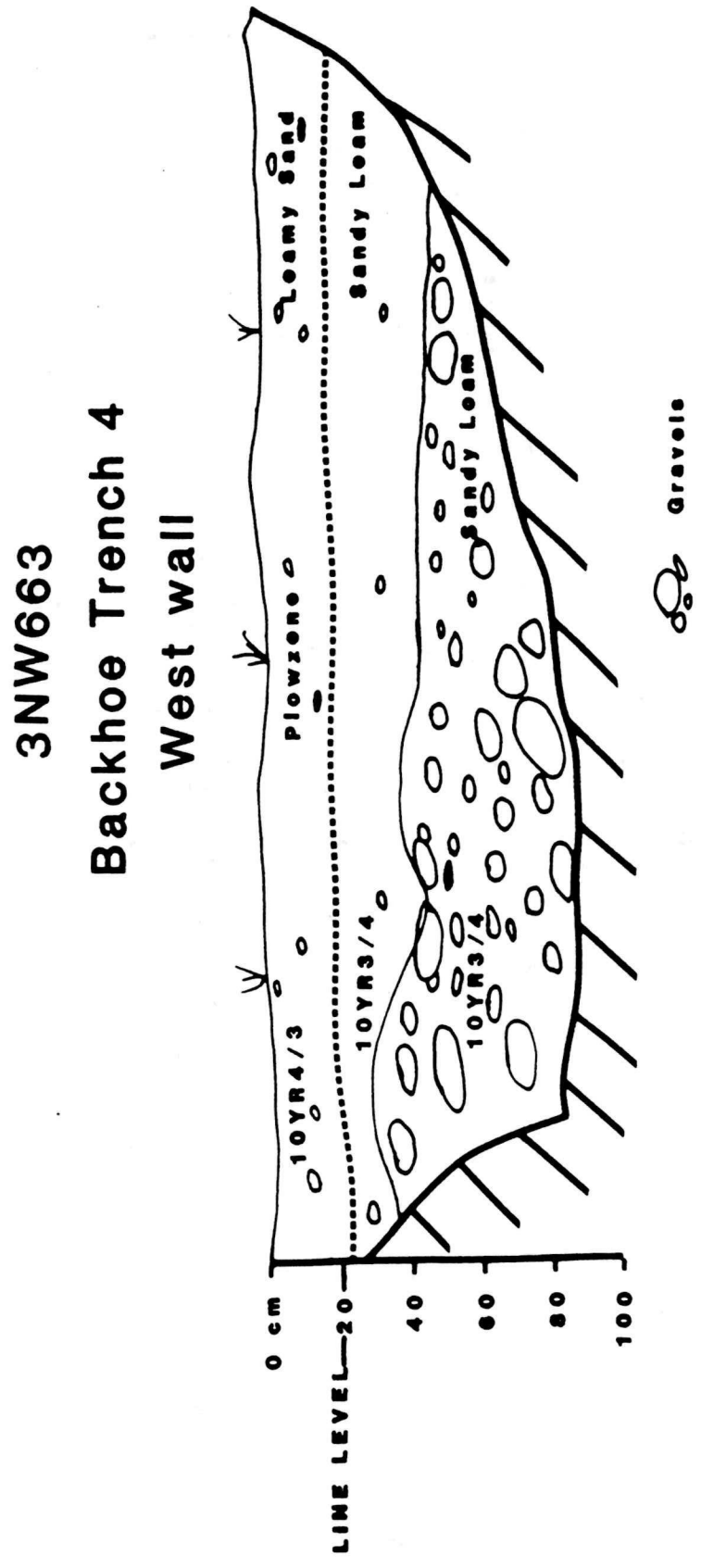


Figure 54. Profile of Backhoe Trench 4, 3NW663.

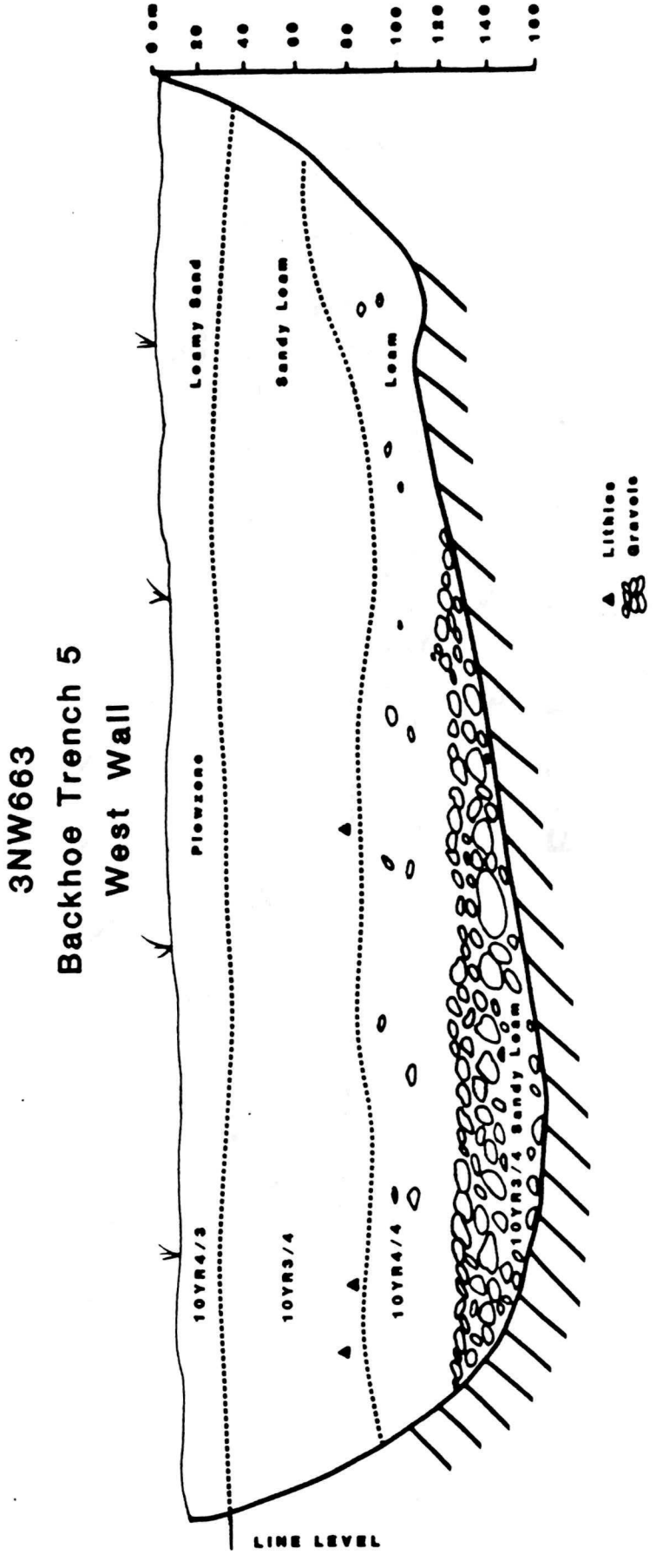


Figure 55. Profile of Backhoe Trench 5, 3NW663.

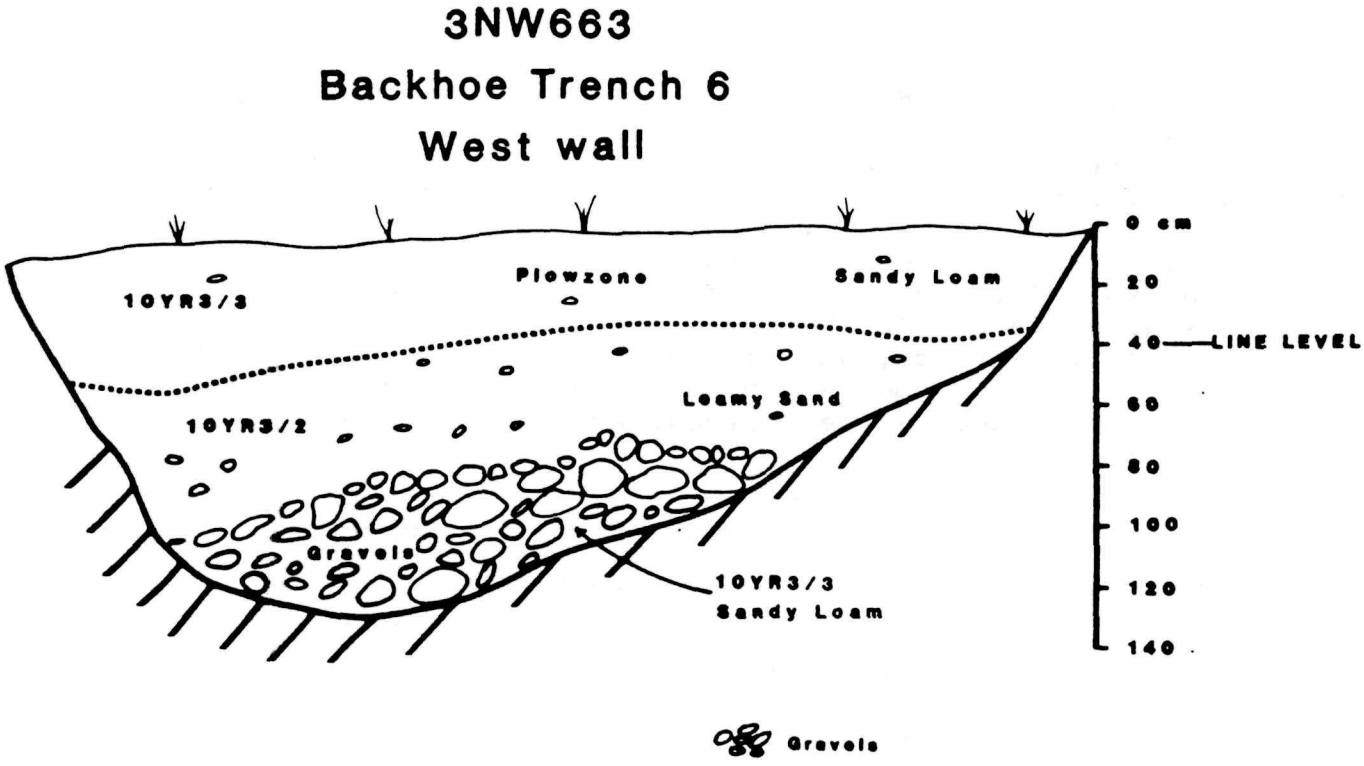


Figure 56. Profile of Backhoe Trench 6, 3NW663.

Table 34. Measurements of the Scrapes, 3NW663.

SCRAPE	LENGTH (m)	WIDTH (m)	DEPTH (cm,average)
1	4.5	4.2	28
2	5.8	3.9	24
3	4.8	4.5	26
4	5.0	4.5	34

Scrape 1

Scrape 1 was placed between Backhoe Trench 1 (where the pit features were found) and Plowed Transect B which had a high density of artifacts. Once the plowzone was removed an intact cultural level consisting of a dark brown (7.5YR4/4) sandy loam and a relatively high density of artifacts were observed. The cultural materials collected while cleaning this scrape are listed in Table 35. No feature stains or obvious clusters of artifacts were found. In the south half of the scrape there was a higher density of rock; and, in the northwestern 1/4, one huge clast or boulder was removed during mechanical scraping. Test Unit 2 was positioned in the northeastern part of the scrape.

Table 35. Artifacts Collected in Scrape 1, 3NW663.

Lanceolate PP/K	1
Side Notched PP/K	1
Stemmed PP/K	1
PP/K Frags	3
CORES & FRAGS	1
TESTED COBBLE	1
PRIMARY DECORT	1
SECONDARY DECORT	2
INTERIOR FLAKE	58
FLAKE FRAGMENTS	38
PREFORM THINNING	7
FIRECRACKED ROCK	5
UNMODIFIED STONE	11
total	130

One lanceolate projectile point which had been extensively reworked was found (FSN 25-2, Figure 44b) in Scrape 1. Both lateral blade margins and the distal tip are steeply retouched and dulled, probably from use as a scraper. The lateral margins of the haft area are battered and may have been ground. The base is deeply concave and thinned by multiple short flakes. It is only very lightly ground, if at all. It is made from white Boone chert, probably heat treated. This specimen is not typeable, but does appear to be an Early Archaic style which could have been reworked at a later date.

The side notched projectile point (FSN 25-1, Figure 44f) is composed of light gray Boone Chert. It is apparently not heat treated and lacks edge grinding. This specimen has edge damage on the blade indicating use as a cutting tool.

Scrape 2

Scrape 2 was placed in the vicinity of charcoal, ash, and burned clay exposed in the Plowed Transect C. During machine scraping and cleaning by hand with hoes and trowels, it was evident that these were burned trees related to historic clearing. Most of the burned areas were shallow and confined to the plowzone.

Scrape 3

Scrape 3 was placed at the edge of the first terrace in line with the row of positive shovel tests conducted in the 1985 survey by Guy Weaver. Only a few artifacts were observed in the surrounding plowed transects. No feature stains or clusters of artifacts were seen. The unit contained a high density of residual chert and sandstone cobbles and gravels which were up to 50 cm in length..

Scrape 4

This scrape was positioned in an area in which the 1985 survey recorded positive shovel tests. It contained evidence of a burned tree in the northwest corner. No artifacts were found in the entire scrape. Residual chert was observed throughout the scrape and on the whole there were few cobbles and gravels present.

TEST UNITS

Three test units were excavated at the site. Two were placed on the high terrace in the area with intact features and deposits. The third was excavated in the flood plain of Moore Creek to investigate the buried deposits.

Test Unit 1

Test Unit 1 was placed northeast of Backhoe Trench 1 to determine if the swale in the eastern end of the trench was cultural or natural. Artifacts collected in this unit are listed in Table 36. The west wall profile is presented in Figure 59.

Levels 0-10 and 10-20 cm bs were definitely composed of plowzone and contained high densities of artifacts. The sediments changed to a more reddish color about 28 cm bd and were interpreted as an intact cultural stratum. Fewer artifacts were collected with depth and no cultural features were present. At 50 cm bd, the northwest quarter was drier than the surrounding matrix and it contained fewer gravels. This portion of the test unit was excavated to 61 cm bd and into the underlying gravel bar. No artifacts were found in this dip in the natural stratum or swale. It probably is an extension of the swale in the northeastern portion of Backhoe Trench 1.

Table 36. Artifacts Collected in Test Unit 1, 3NW663.

	0-10	10-20	20-30	30-40	40-50	TOTAL
Side Notched PP/K		1				1
Stemmed PP/K			1			1
PP/K & FRAGS	1	2	1	1		5
PREFORM	3	2		1		6
HAMMERSTONE	1				1	2
CORES & FRAGS			2			2
TESTED COBBLE		1	1			2
PRIMARY DECORT	4	2		3	2	11
SECONDARY DECORT	1	7	6		1	15
INTERIOR FLAKE	58	111	81	25	14	289
FLAKE FRAGMENTS	102	200	140	67	20	529
PREFORM THINNING	11	16	25	15	6	58
BIFACE THINNING	1	3	1	2		7
PRESSURE FLAKE	6	5	2	4	2	19
FIRECRACKED ROCK	14	7	19	6	1	47
UNMODIFIED STONE	34	21	24	11	1	91
CARBONIZED WOOD	X				X	X
total	236	378	303	135	48	1100

A side notched Big Sandy projectile point (Chapman 1975:242; Bell 1960:8-9) (FSN 44-1, Figure 44e) was found between 10-20 cm below the surface. Although several side notched types have been identified, most date to the Middle Archaic period (Dickson 1987:19). This specimen is made from weathered Boone chert. It has moderately heavy grinding on the base and lateral stem edges.

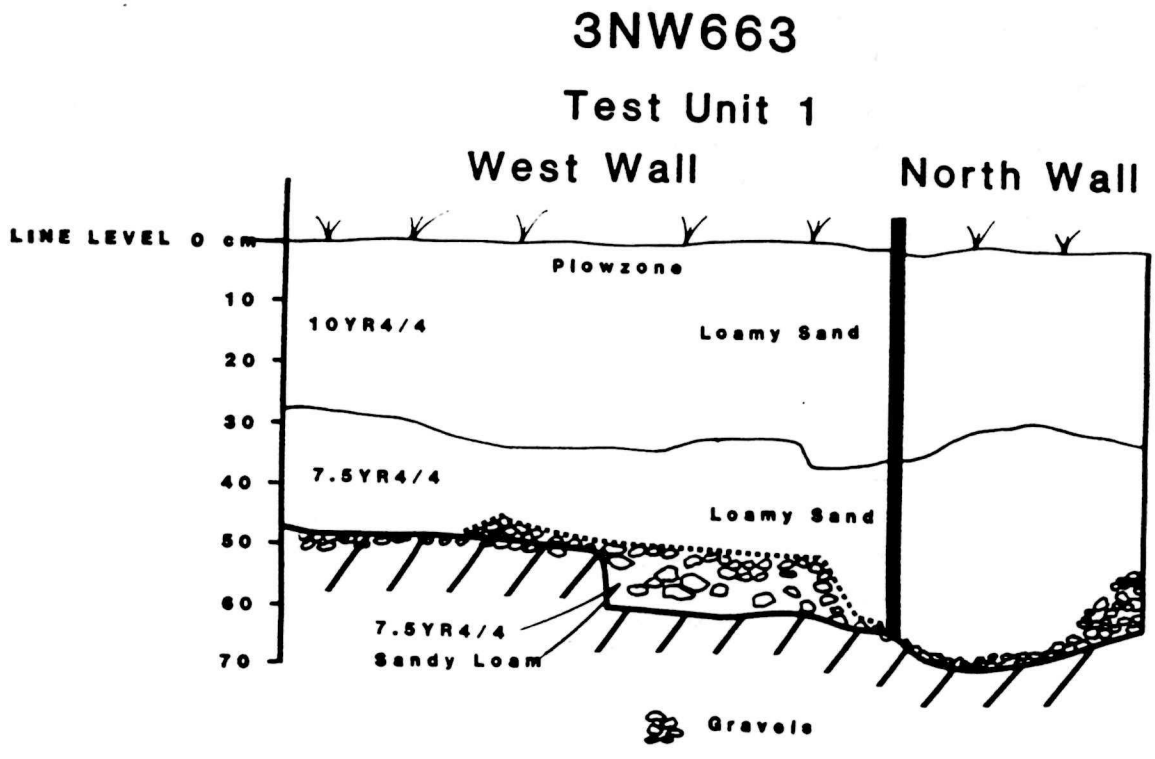


Figure 57. Profile of Test Unit 1, 3NW663.

One Stone Square Stem projectile point (FSN 45-1, Figure 44c) was collected between 20-30 cm below the surface. The blade shows both use retouch and resharpening and is plano-convex in cross section. Both lateral stem edges and the base have moderately heavy grinding. Similar points from Albertson shelter date to 8,000-7,000 B.P. (Dickson 1987:19), while specimens lacking extensive basal grinding are later (Dickson 1987:19; Chapman 1975:257).

Test Unit 2

Test Unit 2 was placed in the northeast corner of Scrape 2 to determine the depth of the intact deposits at this location of the site. The plowzone had been removed by mechanical means and the Scrape 2 had been cleaned with hoes and trowels. It is possible that the upper 2-3 cm of the intact cultural stratum had been destroyed while cleaning. The artifacts collected in this test unit are presented in Table 37 and the East Wall profile is shown in Figure 58. A thin band of plowzone was evident in the East Wall profile because in this direction the mechanically scraped area was slightly higher and not cleaned by hand.

Table 37. Artifacts Collected in Test Unit 2, 3NW663.

	25-35	35-45	TOTAL
SECONDARY DECORT	1	2	3
INTERIOR FLAKE	28	14	42
FLAKE FRAGMENTS	45	33	78
PREFORM THINNING	5	4	9
PRESSURE FLAKE	3	2	5
FIRECRACKED ROCK	5	3	8
UNMODIFIED STONE	12	4	16
total	99	62	161

The first 10 cm level below the plowzone (about 25-35 cm bs) contained a relatively high density of lithics (Table 37). No feature stains or clusters of artifacts were evident. A few flecks of charcoal were observed, but not collected. There was an increase in the frequency of gravels toward the base of the level. The next level (35-45 cm) was composed almost entirely of gravels and most of the artifacts were collected from the top 2-3 cm. A few flecks of charcoal were observed between gravels, but these were not collected. There were no obvious clusters of artifacts and no feature stains. The southeastern quarter of the unit was excavated from 45-55 cm and it contained small and large gravels with clasts up to 30 cm in length. No artifacts were found in this level and the unit was terminated.

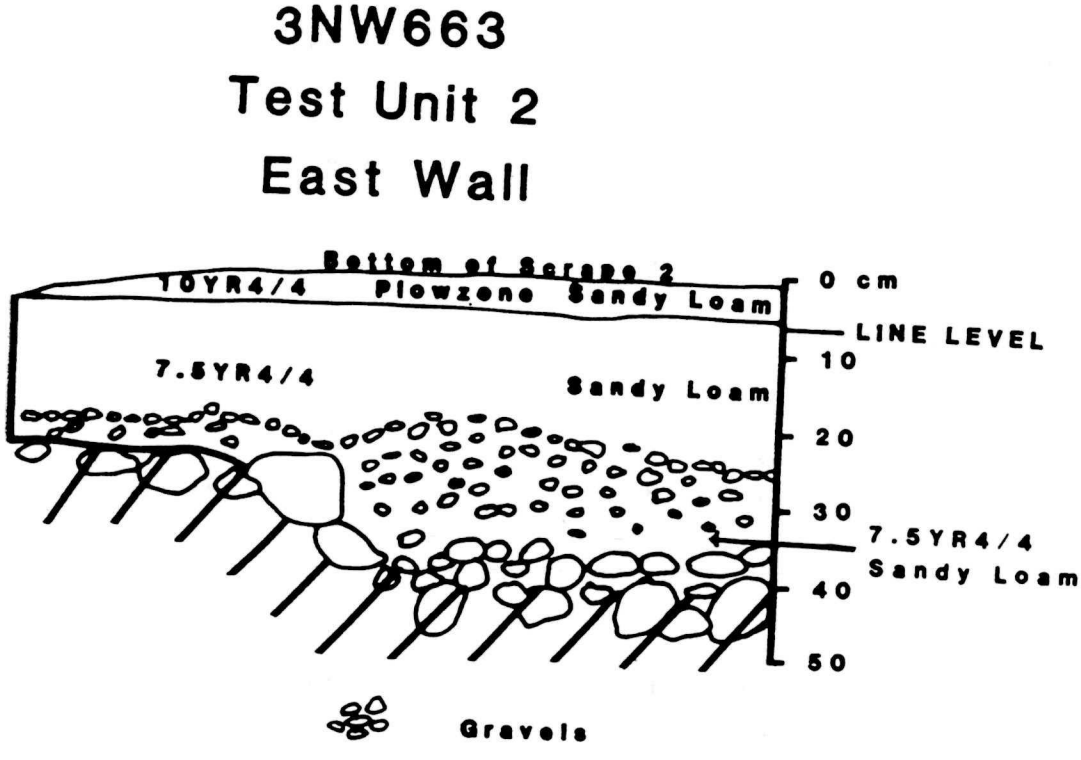


Figure 58. Profile of Test Unit 2, 3NW663.

Test Unit 3

Test Unit 3 was positioned east of Backhoe Trench 5 to examine whether the deeper alluvium contained intact cultural deposits. Artifacts collected in this test unit are presented in Table 38 and the West Wall Profile is shown in Figure 59.

Table 38. Artifacts Collected in Test Unit 3, 3NW663.

	0-10	10-20	20-30	30-40	40-52	52-60	TOTAL
BIFACE						1	1
PRIMARY DECORT				1			1
SECONDARY DECORT		1					1
INTERIOR FLAKE	1			6	2	1	10
FLAKE FRAGMENTS		2		5	2	3	12
PREFORM THINNING				1			1
UNMODIFIED STONE				1	1	1	3
CARBONIZED WOOD					X		X
HISTORIC GLASS	2						2
total	3	3		14	5	6	31

From 0-10 cm and 10-20 cm the sediments consisted of plow-zone deposits and contained historic glass. Sediments beginning at 10 cm were extremely dry and compact and had to be excavated by using a pick. From 20-30 cm bd, no artifacts were found. No cultural materials were evident until about 35 or 38 cm below the surface and 14 flakes were collected in the lower portion of this level to 40 cm. There was no distinct change in the sediment color or texture, but a few flecks of charcoal were evident. From 40-52 cm bd, there was no change in the sediments and five flakes were collected. From 52-60 cm bd, 6 flakes were found but no feature stains or clusters of artifacts were apparent. Sediments below 60 cm had an increasing frequency of gravels and contained a higher clay content. From 80-100 cm bd, the southwest quarter of the unit was excavated and no artifacts were found. The gravels increased in size and frequency with depth.

The cultural deposits as suggested in both Backhoe Trench 5 and Test Unit 3 indicate that there was utilization of this area even though it was an active flood plain subjected to flooding and alluviation. The lack of banded stratigraphy indicates a slow buildup of sediments which through weathering became homogeneous in profile. The antiquity of the prehistoric utilization is not known, but probably does date to the Archaic periods and may be contemporaneous with the occupations on the high terrace.

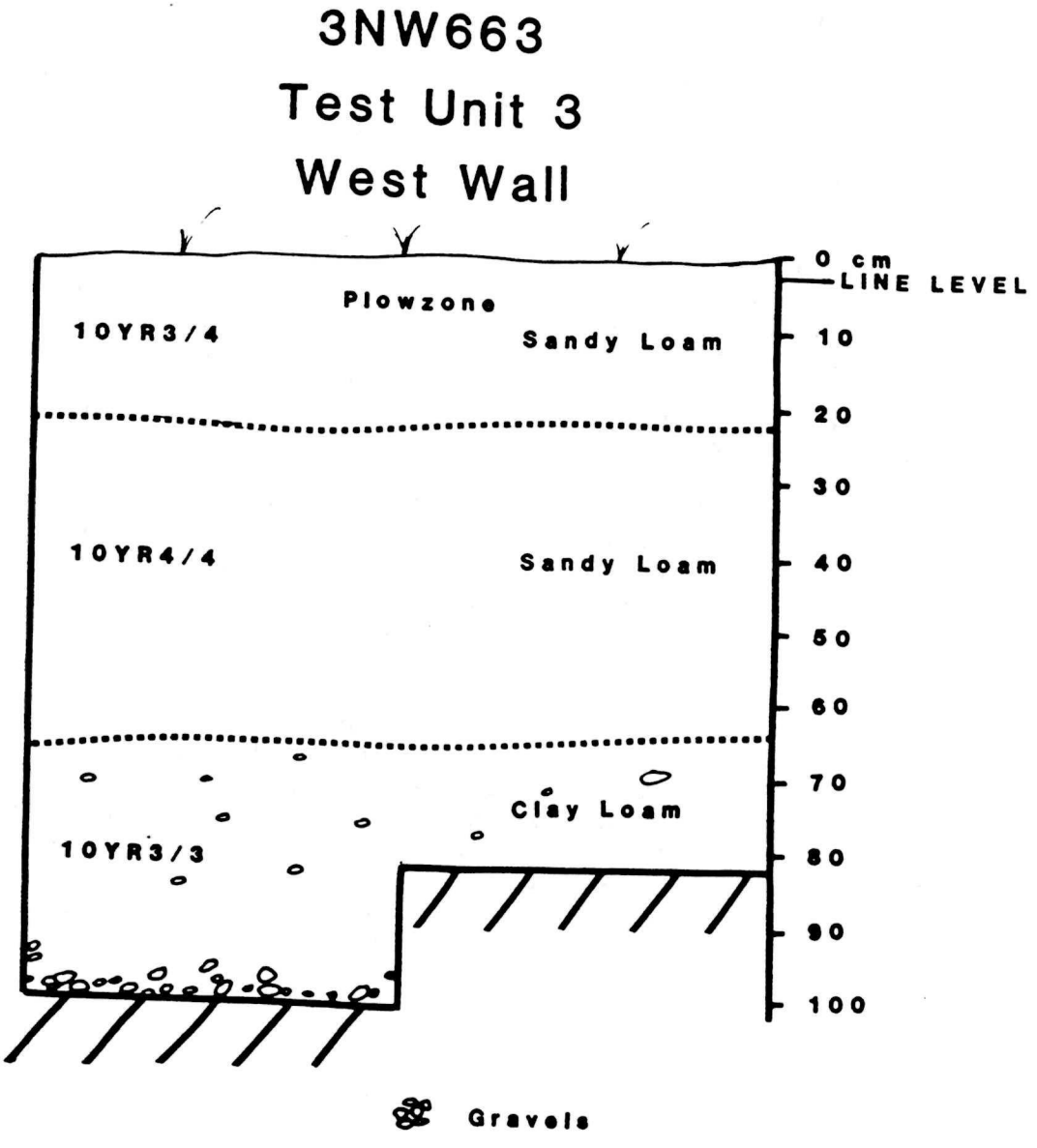


Figure 59. Profile of Test Unit 3, 3NW663.

SIGNIFICANCE

Prehistoric components at the Sattler Site include an intact cultural stratum and feature associated with the Middle Archaic period on a north-south trending terrace and evidence of deeply buried prehistoric utilization in the flood plain of Moore Creek. The intact deposits on the terrace include a 20 cm thick cultural stratum and two large storage/refuse pits. These are the first well documented Middle Archaic features identified on an open site within the Ozark Mountain Region. In SPEARS opinion, the Sattler Site is definitely eligible for nomination to the National Register of Historic Places. This site is worthy of continued research to define the nature of prehistoric utilization during this period.

Since information on Early and Middle Archaic sites has been extremely limited, these two adaptations have often been collapsed and combined in the archeological literature of the Ozarks. Projectile point types have not been segregated and identified for each period and yet a climatic fluctuation, namely a hypsithermal (or warm and dry period) is known to have occurred at the end of the Early Archaic. The apparent lack of adaptive change reflected in the cultural material is probably due to the lack of stratigraphic and chronological control at the limited number of sites investigated. The intact deposits containing datable carbonized remains at the Sattler Site could contribute greatly to chronological refinements and recognition of changes in subsistence technologies between the Early and Middle Archaic periods.

The presence of features and the high density of lithic artifacts within the intact deposits is particularly important to determining the activities conducted at the site. Population increased during the Middle Archaic, and there is some evidence that people were becoming more sedentary. The raw material frequencies within the assemblage indicate that locally available materials were used to manufacture tools. These and other hypotheses could be tested with data from stratified deposits and features at the Sattler Site.

The geomorphic study of the landform verified its antiquity. Since the river moved away from this terrace thousands of years ago, sediments were no longer deposited on its surface. The lack of loamy soils which are replenished with nutrients from overbank deposits has made this an undesirable location for prehistoric inhabitants who relied heavily on horticulture/agriculture. The lack of disturbance by later occupations heightens the value of this site. The geomorphic study has also indicated that because of the age of the sediments, there is a potential for a Paleo-Indian component toward the base of the intact cultural zone and/or in the deeper buried deposits within the flood plain of Moore Creek. Due to our limited knowledge of Paleo-Indian lifeways, the search for these types of sites followed by intensive investigations must continue.

Chapter 8

CULTURAL RESOURCE MANAGEMENT RECOMMENDATIONS

Carol S. Spears

THE EDGMON SITE (3NW661)

SPEARS investigations indicated that the Edgmon Site (3NW661), which is located on the flood plain of Smith Creek, was not extensively utilized/occupied during prehistory. The field methods included the examination of the surfaces of 6 plowed transects and the excavation of 6 scrapes, 6 backhoe trenches, and 4 test units. All units were dispersed throughout the 12 acre field. The cultural deposits were shallow and contained low densities of artifacts and diagnostics. On the basis of the subsurface tests performed, the Edgmon Site (3NW661) has little research value and is not significant or eligible for nomination to the National Register. SPEARS recommends that this portion of the parcel be allowed to return to private ownership as long as the integrity of the rural pastoral landscape of Boxley Valley is perpetuated in accordance with National Park Service management objectives (NPS 1985).

LUALLEN SITE (3NW661)

As shown in this study, the Luallen Site (3NW662) contains thick, organically rich Woodland and Mississippian middens; high densities of artifacts; and recognizable features. Intact anthropic strata probably dating to the Archaic are deeply buried. The intact deposits cover the entire 60 acre tract investigated and continue beyond into the southernmost field and under the historic farm complex. The information contained in the Luallen Site (3NW662) is extremely valuable to understanding the prehistory of the region. The amount and kinds of research which can be accomplished are unlimited. The Luallen Site (3NW662) is unequivocally eligible for nomination to the National Register of Historic Places. This site should be considered as an excellent location for a long term program of archeological research and cultural interpretation. Until that time, the deposits must be protected. If protection is not possible, then the site should be excavated.

Recommendations

Specific recommendations for the management of the prehistoric components at the Luallen Site (3NW662) should include:

1. Stabilize all actively eroding areas and maintain an adequate ground cover to obscure surface materials and discourage collecting.

2. Smooth the deep furrows and seed the plowed transects to facilitate haying and retain the pastoral setting.

3. Allow public access to the spring, but close the trails/roads which cut across and erode the site.

4. Occupy or utilize the farm complex on a regular basis (i.e. as a residence, a park building or an interpretative center) to regain the integrity of the structures and to monitor activities on the parcel.

5. Add the prehistoric components of the Luallen Site (3NW662) to the Big Buffalo Valley Historic District Nomination.

6. Continue to study the ramifications of a sell back, legally, and practically. Include discussions with all parties involved to assure that National Register Properties are adequately managed. It must be adequately proven that the deposits will not be disturbed and that federal funds, when and if they become available, could be used to conduct research at the site.

7. Develop a cultural resource management plan for the site.

8. Seek funds for a long term archeological research project at the Luallen Site (3NW662).

9. Continue to educate the public concerning the historic and prehistoric significance of Boxley Valley.

SATTLER SITE (3NW663)

The archeological investigations conducted by SPEARS at the Sattler Site (3NW663) included: 5 plowed transects, 4 scrapes, 6 backhoe trenches, 3 test units, and the complete excavation of two Middle Archaic pits. As a result of this testing, two areas in this tract contain intact deposits and are significant and eligible for nomination to the National Register. On the upper terrace in an area measuring about 150 m N-S by 100 m E-W, there is a 20 cm thick cultural stratum remaining beneath the plowzone. Two refuse pits which contained a high density of hickory nutshells and lithics originated toward the top of this intact unit. On the flood plain, in an area not larger than 150 m in diameter, deeply buried intact cultural deposits were exposed. The Sattler

Site should be considered as an excellent location for archeological research. Until that time, two areas of the site containing important deposits must be protected. If protection of the deposits cannot be assured, then the Sattler Site (3NW663) should be investigated through data recovery.

Recommendations

Specific Recommendations for the management of the prehistoric components at the Sattler Site (3NW663) should include:

1. Stabilize all actively eroding areas and maintain sufficient ground cover to obscure surface artifacts and to discourage collecting.

2. Smooth the deep furrows and reseed the plowed transects so that the hay can be harvested and the pastoral setting maintained.

3. Monitor the site to discourage looting and vandalism.

4. Add the prehistoric archeological components of the Sattler Site (3NW663) to the Big Buffalo Valley Historic District Nomination.

5. Continue to study all ramifications of a sell back, legally, and practically. Include discussions with all parties involved to assure that National Register Properties adequately maintained. It must be successfully demonstrated that this site will not be adversely disturbed, that any protective covenants can be adequately monitored and that, if and when federal funds become available for research, the site is accessible for future research.

6. Develop a cultural resource management plan for the Sattler Site (3NW663).

7. Seek funding to conduct archeological research at the site.

8. Continue to educate the public concerning the historic and prehistoric significance of Boxley Valley. Enhance their awareness and respect for cultural resources.

GENERAL RECOMMENDATIONS

Archeological research must be accomplished in a responsible manner to both the private citizens who have agricultural permits on park lands and the cultural resources. Scopes-of-work should include provisions for returning the fields back to conditions prior to testing or excavation. In this study, disturbed surfaces including the deep furrows on the plowed transects should have been smoothed over and the transects seeded. Backhoe trenches, scrapes, and test units must be backfilled and seeded

also. The scope-of-work should include provisions for mitigating the adverse impact of exposing thousands of artifacts in the plowed transects. Popular and accessible sites where rich cultural middens are found should be subjected to controlled surface collections and scientific study, or monitored by National Park personnel frequently until adequate vegetation cover has obscured the surface of the site.

Due to the lack of knowledge about prehistoric utilization of the Buffalo River resulting from small piecemeal archeological projects, SPEARS recommends the development of a cultural resource management plan for the entire Buffalo River Park. The plan should include provisions for the archeological survey of all areas within the park, a testing program at potentially eligible sites, and excavations at sites with excellent contexts. This information is vital to understanding prehistoric utilization and occupation along the Buffalo River. The concept that mitigation can include limited excavations in only that part of a site to be disturbed needs further evaluation. The analysis of the data without comparative information from the entire site or other similar sites may result in limited and inaccurate interpretations.

The Buffalo River is one of the few remaining fee flowing rivers in northwest Arkansas. Its associated floodplains, mountains, and bluffshelters contain the best accessible sample of archeological deposits. Through proper management of these cultural resources and scientific research, information concerning prehistoric lifeways can be saved for the future.

REFERENCES CITED

Asch, Nancy B., Richard. I. Ford, and David. L. Asch
1972 *Paleoethnobotany of the Koster Site: The Archaic Horizons.* Illinois State Museum Research Papers No. 6.

Baker, Charles M.
1975 *Arkansas Eastman Archeological Project.* Arkansas Archeological Survey Research Report No. 6. Fayetteville.

Bartlett, Charles S., Jr.
1963 The Tom's Brook Site--3J01: A Preliminary Report. *Arkansas Archeology 1962*, edited by Charles R. McGimsey III, pp. 15-65. Arkansas Archeological Society, Fayetteville.

Bartram, William
1792 *The Travels of William Bartram*, edited by Francis Harper. Yale University Press, New Haven, 1958.

Bell, Robert E.
1958 Guide to the Identification of Certain American Indian Projectile Points. *Oklahoma Anthropological Society Special Bulletin* No. 1. University of Oklahoma Printing Services, Norman, Oklahoma.

1960 Guide to the Identification of Certain American Indian Projectile Points. *Oklahoma Anthropological Society Special Bulletin* No. 2. Hoffman Printing Co., Inc., Muskogee, Oklahoma.

Bradford, James E.
1979 Archeological Investigations of the Lost Valley, Steel Creek, and Buffalo Point Development Areas, Buffalo National River, Arkansas. Ms. on file, Southwest Cultural Resources Center, Southwest Region, National Park Service, Santa Fe, New Mexico, and Arkansas Archeological Survey, Fayetteville.

Branner, John C.
1900 The Zinc and Lead Region of North Arkansas. *Annual Report of the Geological Survey of Arkansas for 1892.* Thompson, Little Rock.

Braun, Lucy E.
1967 *Deciduous Forest of Eastern North America.* Harper Publishing Co.

Brown, James A.
1984 *Prehistoric Southern Ozark Marginality: A Myth Exposed.* Missouri Archeological Society Special Publications, No. 6. University of Missouri, Columbia.

Brown, James A., Robert E. Bell, and Don Wyckoff
1978 Caddoan Settlement Patterns in the Arkansas River Drainage. In *Mississippian Settlement Patterns*, edited by Bruce D. Smith, pp. 169-200. Academic Press, New York.

Catesby, Mark
1731-1734 *The natural history of Carolina, Florida, and Bahama Islands.* 2 vols.

Center for Ozark Studies
1984 Upper Big Buffalo Area, Boxley Valley, Oral History Project, Phase II. Submitted to the National Park Service, Buffalo National River.

Chapman, Carl H.
1975 *The Archaeology of Missouri*, I. University of Missouri Press, Columbia.

1980 *The Archaeology of Missouri*, II. University of Missouri Press, Columbia.

Cleland, Charles E.
1965 Faunal Remains from Bluff Shelters in Northwest Arkansas. *The Arkansas Archeologist* 6:39-63.

Cobb, James A.
1976 *The Functional Analysis of Late Prehistoric Remains from Bontke Shelter.* Master's thesis, Department of Anthropology, University of Arkansas, Fayetteville.

Coe, Jeffre L.
1964 The Formative Cultures of the Carolina Piedmont. *American Philosophical Society, Transactions* 54, Pt.5.

Coleman, Roger E.
1986 *Archeological Reconnaissance of the Casey-Clark Tract and Survey of Proposed Trail Segments, Buffalo National River, Newton County, Arkansas.* National Park Service, Southwest Regional Office, Southwest Cultural Resources Center, Branch of Cultural Resources Management, Santa Fe, New Mexico.

Cotterell, Brian, and Johan Kamminga
1987 The Formation of Flakes. *American Antiquity* 52: 675-708.

Cozzens, Arthur B.
1940 Physical Profiles of the Ozark Province. *Midland Naturalist* 24:477-489.

Davis, Hester A. (editor)
1982 *A State Plan for the Conservation of Archeological Resources in Arkansas.* Arkansas Archeological Survey Research Series No. 21. Fayetteville.

Day, P. R.
1965 Particle Fractionation and Particle Size Analysis. *Methods of Soil Analysis, Part I: Agronomy 9*, edited by C. A. Black, pp. 552-562.

Dellinger, Samuel C.
1932 The Bluff Shelters of Arkansas. In *Birmingham Conference on State Archaeological Surveys*, pp. 31-34. National Research Council, Washington, D.C. Mimeographed.

1936 Baby Cradles of the Ozark Bluff Dwellers. *American Antiquity* 1:197-214.

Dellinger, Samuel C., and Samuel D. Dickinson
1942 Pottery from the Ozark Bluff Shelters. *American Antiquity* 7:276-289, 311-318.

Dickson, Don R.
1970 Excavations at Calf Creek Cave. *The Arkansas Archeologist* 11:50-82.

1987 Typology, Classification, and Southern Ozark Hafted Bifaces. *Missouri Archeological Society Quarterly* 4 (2).

Dixon, John C.
1986 Sedimentological Characteristics and the Origin of Fluvial Sediments at Sites Tested in the Rush Creek Development Area. In *Archeological Testing, Geomorphic Interpretations, and History of the Rush Development Area in the Buffalo National River, Marion County, Arkansas.* Spears Professional Environmental & Archeological Research Service Report No. 86-3. Submitted to National Park Service, Southwest Region, Purchase Order No. PX7029-6-0320.

Downs, J. W.
1983 *The Lithostratigraphy of the Pitkin Limestone (Chesterian), Newton and Searcy County, Arkansas.* Master's thesis, University of Arkansas, Fayetteville.

Easton, William H.
1942 *Pitkin Limestone of Northern Arkansas.* Arkansas Geological Survey, Bulletin 8. Little Rock.

Erwin, Stephen L.
1972 Some Boone Chert versus Pitkin Chert Archeological Relationships in Northern Arkansas, or "Where Did this Black Chert Come from?" Ms. on file, Arkansas Archeological Survey, Fayetteville.

Fowlkes, David H., Richard T. McCright, and J. Sidney Lowrance
1988 *Soil Survey of Newton County, Arkansas.* USDA Soil Conservation Service and Forest Service in cooperation with the Arkansas Agricultural Experiment Station.

Fowells, H. A.
1965 *Silvics of Forest Trees of the United States* USDA Forest Service, Agriculture Handbook No. 271.

Fritz, Gayle J.
1979 Mounds in the Ozarks of Northwest Arkansas. Paper presented to the 21st Annual Caddo Conference, Arkadelphia.

1984 Identification of Cultigen Amaranth and Chenopod from Rockshelter Sites in Northwest Arkansas. *American Antiquity* 49:558-572.

1986 Dessicated Botanical Remains from Three Bluffshelter Sites in the Pine Mountain Project Area, Crawford County, Arkansas. In *Contributions to Ozark Prehistory*, edited by George Sabo III, pp. 86-97. Arkansas Archeological Survey Research Series No. 27. Fayetteville.

Gilmore, Melvin R.
1931 Vegetal Remains of the Ozark Bluff-Dweller Culture. *Papers of the Michigan Academy of Science, Arts and Letters* 14: 83-102.

Gregoire, Thelma Lee
1971 Falling Water Falls Site. *The Arkansas Archeologist* 12:21-38.

Goodyear, Albert C. III
1982 The Chronological Position of the Dalton Horizon in the Southeastern United States, *American Antiquity* 47:382-396.

Guccione, Margaret J.
1988 Late Quarternary History of the Buffalo River. In *Tracks In Time: Archeology At The Elk Track (3NW206) and Webb Branch Sites (3NW206), Erbie Campground Project, Buffalo National River, Newton County, Arkansas.* Prepared for National Park Service, Southwest Region by Mid-Continental Research Associates, Report No. 88-1. Contract No. CA7029-6-0018.

Haley, Boyd R., Ernest E. Glick, William V. Bush, Benjamin F. Clardy, Charles G. Stone, Mac B. Woodward, and Doy L. Zachary
1976 *Geologic Map of Arkansas.* Arkansas Geological Commission and the United States Geological Survey. Little Rock.

Harrington, Mark R.
1960 The Ozark Bluff-Dwellers. *Museum of the American Indian, Heye Foundation, Indian Notes and Monographs* 12.

Hilliard, Jerry E.
1980 *Prehistoric Ozark Settlement-Subsistence and Nut Resources Utilization.* Unpublished Master's Thesis, University of Arkansas, Fayetteville.

1986 Selection and Use of Acorn Species by Late Prehistoric Ozark Inhabitants. In *Contributions to Ozark Prehistory*, edited by George Sabo III. Arkansas Archeological Survey Research Series No. 27.

House, John
1965 Bluff-top Indian Sites. *The Arkansas Archeologist* 6:12-13.

1975 Prehistoric Lithic Resource Utilization in the Cache Basin, Crowley's Ridge Chert and Quartzite and Pitkin Chert. In *The Cache River Archeological Project: An Experiment in Contract Archeology*, assembled by Michael B. Schiffer and John H. House. Archeological Survey Research Series No. 8. Fayetteville.

James, Douglas, Edward E. Dale, Jr., M. Joseph Lockerd, David Schick, and Charles R. Preston
1979 *Appraisal of the Avifauna, Mammalian Fauna, and Plant Communities of Developmental Sites Proposed for the Buffalo National River.* Departments of Zoology and Botany and Bacteriology, University of Arkansas, Fayetteville. Submitted to U.S. Department of Interior, National Park Service, Southwest Region, Santa Fe, New Mexico, Contract No. CX7029-8-0013.

Jurney, David H., Jr.
1981 Source and Distribution of Specialized Stone Tools in the Ozarks. *Mid-Continental Journal of Archeology*. Vol. 6, No.1, pp. 18-31.

Kay, Marvin
1982 Stylistic Study of Chipped Stone Points from Rodgers Shelter. In *Holocene Adaptations Within the Lower Pomme de Terre River Valley, Missouri*, vol. 2, edited by Marvin Kay, pp. 379-559. Illinois State Museum Society, Springfield, Illinois. Submitted to U.S. Army Corps of Engineers, Kansas City District, Contract No. DACW 41-76-C-0011.

1982 Principal Component Analysis of Ground Stone. In *Holocene Adaptations Within the Lower Pomme de Terre River Valley, Missouri*, vol. 2, edited by Marvin Kay. Illinois State Museum Society, Springfield, Illinois. Submitted to U.S. Army Corps of Engineers, Kansas City District, Contract No. DACW 41-76-C-0011.

King, Francis B.
1976 Forest Density and Nut Production Potential for the Rodgers Shelter Area. In *Prehistoric Man and His Environments: A Case Study in the Ozark Highlands*, edited by Raymond Wood and R. Bruce McMillan. Academic Press, New York.

Klein, Jeffrey, J. C. Lerman, P. E. Damon, and F. K. Ralph
1982 Calibration of Radiocarbon Dates: Tables Based on the Consensus Data of the Workshop on Calibrating the Radiocarbon Time Scale. *Radiocarbon* 24(2):103-150.

Klinger, Timothy C., and Kathleen A. Hinkle
1986 *Cultural Resources Survey of a Proposed Campground Facility at Carver Bridge, Buffalo National River, Newton County, Arkansas.* Historic Preservation Associates. Report submitted to the National Park Service, Southwest Region, Contract No.PX029-6-0094.

Lackey, Walter F.
1950 *History of Newton County, Arkansas.* Zions, Independence, Missouri.

Lafferty, Robert H. III, Neal H. Lopinot, Margaret J. Guccione, Michael C. Sierzchula, Lawrence G. Santeford, Susan L. Scott, Kathryn A. King, Kathleen M. Hess, and Linda Scott Cummings
1988 *Tracks In Time: Archeology At The Elk Track (3NW206) and Webb Branch Sites (3NW206), Erbie Campground Project, Buffalo National River, Newton County, Arkansas.* Prepared for National Park Service, Southwest Region by Mid-Continental Research Associates, Report No. 88-1. Contract No. CA7029-6-0018.

Limp, W. Fredrick
1985 *Report on Emergency Excavations of Two Features at 3NW539, Boxley Valley, Buffalo National River.* Sponsored Research Program, Arkansas Archeological Survey, Project No. 597. Submitted to National Park Service, Southwest Regional Office, Santa Fe, New Mexico, Purchase Order PX7029-5-0618.

Lopinot, Neal H.
1988 Archaeobotany of the Erbie and Webb Branch Sites. In *Tracks In Time: Archeology At The Elk Track (3NW206) and Webb Branch Sites (3NW206), Erbie Campground Project, Buffalo National River, Newton County, Arkansas.* Prepared for National Park Service, Southwest Region by Mid-Continental Research Associates, Report No. 88-1. Contract No. CA7029-6-0018.

Manger Walter L.
1974 *General Geology Lab Manual.* Department of Geology, University of Arkansas, Fayetteville.

Marshall, Richard A.
1958 *The Use of Table Rock Reservoir Projectile Points in the Delineation of Cultural Complexes and their Distribution.* Master's Thesis, Department of Anthropology, University of Missouri, Columbia.

McMillan, R. Bruce
1976 Rodgers Shelter: A Record of Cultural and Environmental Change. In *Prehistoric Man and His Environments: A Case Study in the Ozark Highlands*, edited by W. Raymond Wood and R. Bruce McMillan, pp. 111-122. Academic Press, New York.

1976 The Dynamics of Cultural Change at Rodgers Shelter, Missouri. In *Prehistoric Man and His Environments: A Case Study in the Ozark Highlands*, edited by W. Raymond Wood and R. Bruce McMillan, pp. 211-232. Academic Press, New York.

Miller, Henry
1972 A Vegetal Reconstruction of Early Historic Northwest Arkansas. Ms. on file, Arkansas Archeological Survey, Fayetteville.

Markham, Robert Paul
1972 *The Arkansas Cherokees: 1817-1828.* Ph.D. dissertation, University of Oklahoma. University Microfilms, Ann Arbor, Michigan.

National Park Service
1985 *Land Use Plan, Cultural Landscape Report, Boxley Valley, Buffalo National River, Arkansas.* USDI National Park Service, Denver Service Center, Denver.

Newton, John P.
1975-77 Paleo-Indian in the Arkansas Ozarks: A Preliminary Statement. *The Arkansas Archeologist* 16, 17, 18:85-90.

Parmalee, Paul W., and R. Bruce McMillan
1976 Changing Subsistence Patterns at Rodgers Shelter. In *Prehistoric Man and His Environments: A Case Study in the Ozark Highlands*, edited by W. Raymond Wood and R. Bruce McMillan. Academic Press, New York.

Payne, Willard W., and V. H. Jones
1962 The Taxonomic Status and Archeological Significance of a Giant Ragweed from Prehistoric Bluff Shelters in the Ozark Plateau Region. *Papers of the Michigan Academy of Science, Arts, and Letters* 47:147-163.

Perino, Gregory
1968 Guide to the Identification of Certain American Indian Projectile Points. *Oklahoma Anthropological Society Special Bulletin* No. 3. University of Oklahoma Printing Services, Norman, Oklahoma.

1971 Guide to the Identification of Certain American Indian Projectile Points. *Oklahoma Anthropological Society Special Bulletin* No. 4. University of Oklahoma Printing Services, Norman, Oklahoma.

Pitcaithley, Dwight Townsend
1976 *Buffalo River: An Ozark Region from Settlement to National River.* Ph.D. dissertation, Texas Tech University, Lubbock.

Raab, Mark L.
1976 *Pine Mountain: A Study of Prehistoric Human Ecology in the Arkansas Ozarks.* Arkansas Archeological Survey Research Report 7. Fayetteville.

Ray, Jack H.
1986 Preliminary Survey: Pitkin Chert Artifacts in Southern Missouri. *Missouri Archaeological Society Quarterly* 3(4):17-19.

Read, Ralph A.
1951 Woodland Forage in the Arkansas Ozarks. *Journal of Range Management* 4:391-396.

1952 Tree Species Occurrence as Influenced by Geology and Soil on an Ozark North Slope. *Ecology* 33:239-246.

Reed, Clarence and John Davidson
1954 *The Improved Nut Trees of North America and How to Grow Them.* The Devin-Adair Co., New York.

Reinhold, R. O.
1959 Climate of Arkansas. *Climates of the States: Arkansas.* U. S. Department of Commerce, Climatography of the United States No. 60-3 (Reprinted 1969). Washington, D.C.

Robinson, Christine K.
1982 Ground Stone. In *Holocene Adaptations Within the Lower Pomme de Terre River Valley, Missouri*, vol. 2, edited by Marvin Kay, pp. 379-559. Illinois State Museum Society, Springfield, Illinois. Submitted to U.S. Army Corps of Engineers, Kansas City District, Contract No. DACW 41-76-C-0011.

Rolingson, Martha Ann Michael J. Kaczor
1987 *Toltec-Delos Artifact Inventory System and Dictionary.* Arkansas Archeological Survey Technical Paper No. 7a. Fayetteville.

Sabo, George III
1986 Preliminary Excavations at the Huntsville Site: A Caddoan Civic-Ceremonial Center in Northwest Arkansas. In *Contributions to Ozark Prehistory*, edited by George Sabo III, pp. 55-76. Arkansas Archeological Survey Research Series No. 27. Fayetteville.

Sabo, George III, David B. Waddell, and John H. House
1982 *A Cultural Resource Overview of the Ozark-St. Francis National Forests, Arkansas.* Arkansas Archeological Survey, Project No. 497. Submitted to USDA Forest Service, Ozark-St. Francis National Forests, Russellville, Arkansas. Contract No. 53-43ZP-1-00984.

Saucier,Roger T.
1984 *Historic Changes in Current River Meander Regime.* Reprinted from Proceedings of the Conference of Rivers '83, Waterway Port, Coastal and Ocean Division. American Society of Engineers, New Orleans, Louisiana. October 24-26, 1983.

Schambach, Frank F.
1970 *Pre-Caddoan Cultures in the Trans-Mississippi South: A Beginning Sequence.* Ph.D. Dissertation, Harvard University, Cambridge.

1982 An outline of Fourche Maline Culture in Southwest Arkansas. *Arkansas Archeology in Review*, edited by Neal L. Trubowitz and Marvin D. Jeter, pp. 132-197. Arkansas Archeological Survey Research Series No. 15. Fayetteville.

Scholtz, Sandra Clements
1975 *Prehistoric Plies: A Structural and Comparative Analysis of Cordage, Netting, Basketry, and Fabric from Ozark Bluff Shelters.* Arkansas Archeological Survey Research Series No. 9. Fayetteville.

Scholtz, James A.
1969 A Summary of Prehistory in Northwest Arkansas. *The Arkansas Archeologist* 10:50-60.

Scott, Susan L.
1988 Faunal Analysis. In *Tracks In Time: Archeology At The Elk Track (3NW206) and Webb Branch Sites (3NW206), Erbie Campground Project, Buffalo National River, Newton County, Arkansas.* Prepared for National Park Service, Southwest Region by Mid-Continental Research Associates, Report No. 88-1. Contract No. CA7029-6-0018.

Sierzchula, Michael
1984 *Archeological Investigations of Selected Areas of Buffalo National River, Arkansas.* National Park Service, Southwest Cultural Resources Center, Santa Fe, New Mexico.

Smith, Bruce D. (editor)
1978 *Mississippian Settlement Patterns.* Academic Press, New York.

Soil Survey Staff
1981 Examination and Description of Soils in the Field, Draft Revision of Chapter 4, *Soil Survey Manual, Agriculture Handbook* No. 18. USDA, U. S. Government Printing Office, Washington, D.C.

Spears, Carol S.
1975 Hammers, Nuts, and Jolts, Cobbles, Cobbles, Cobbles: Experiments in Cobble Technologies in Search of Correlates. In *Arkansas Eastman Archeological* Project. Arkansas Archeological Survey Research Report No.6.

n.d. The Procurement, Use, Reuse, and Discard of Nonsiliceous Stones from Selevac. In *Selevac: A Neolithic Village in Yugoslavia*. Institute of Archeology Press, University of California, Los Angeles. (in press).

Spears, Carol S., and Robert H. Lafferty
1985 *Archeological Survey of 13 Acres and Testing in the Boxley Area of the Buffalo National River, Newton County, Arkansas*. Report prepared by Mid-Continental Research Associates for the National Park Service.

1986 *Archeological Testing of Three Sites: 3WA454, the Maple Leaf Site, 3BE327, the Black Bank Site, and 3BE332, the O.D. Site, Wedington Unit, Ozark National Forest, Arkansas*. Mid-Continental Research Associates Report No. 85-10. Submitted to USDA Forest Service, Ozark-St. Francis National Forest, Russellville, Arkansas, Contract No. 53-7J18-5-726.

Spears, Carol S., Robert A. Taylor, John C. Dixon, and Suzanne D. Rogers
1986 *Archeological Testing, Geomorphic Interpretations and History of Four Areas in the Rush Development Area of Buffalo National River, Marion County, Arkansas*. SPEARS Report No. 86-3. Submitted to National Park Service, Southwest Region, Purchase Order PX7029-6-0320.

Spector, William S.
1956 *Handbook of Biological Data*, W. B. Sanders, Philadelphia.

Sprague, Mary Gabrielle
1979 *The Life Cycle of a Quern: An Analysis of the Grindstones from the Neolithic Site of Selevac, Yugoslavia*. Master's Thesis, Department of Anthropolgy, Harvard University, Cambridge, Massachusetts.

Swanton, John R.
1946 *The Indians of the Southeastern United States*. Bureau of American Ethnology Bulletin No.137. Smithsonian Institution, Washington, D.C.

Taylor, Robert A.
1975 Survey for Buried Paleo-Indian Sites in Arkansas. In *The Cache River Archeological Project: An Experiment in Contract Archeology*, assembled by Michael B. Schiffer and John H. House, pp. 199-203. Arkansas Archeological Research Series No. 8. Fayetteville.

Thomas, Ronald A.
1962 Projectile Point Sequence at Breckenridge Shelter. *The Arkansas Archeologist* 3(10):1-3.

1968 *Breckenridge: A Stratified Shelter in Northwest Arkansas.* University of Arkansas Museum. Research conducted under a cooperative agreement between NPS, Southeast Region and University of Arkansas Museum. Contract No. 14-10-0131-967.

Thornbury, W. D.
1967 *Regional Geomorphology of the United States.* John Wiley & Sons, New York.

Toney, James T.
1977 A Preliminary Field Study of the Archeological and Historical Resources of an Eight Mile Portion of the Tyronza River, Poinsett, County, Arkansas. In *Contract Archeology in the Lower Mississippi Valley of Arkansas, Miscellaneous Papers*, assembled by Timothy C. Klinger. Arkansas Archeological Survey Research Report 12, Fayetteville.

Trubowitz, Neal L.
1980 *Pine Mountain Revisited: An Archeological Study in the Arkansas Ozarks.* Arkansas Archeological Survey Research Report No. 23. Fayetteville.

Turner, Lewis M.
1935 Notes on Forest Types of Northwestern Arkansas. *American Midland Naturalist* 16:417-421.

United States Department of Agriculture
1948 Woody Plant Seed Manual. United States Department of Agriculture, *Miscellaneous Publications* 65. U.S. Government Printing Office, Washington, D.C.

1965 Silvics of Forest Trees of the United States. United States Department of Agriculture,*Handbook 271.* U.S. Government Printing Office, Washington, D.C.

Walker, Winslow
1932 *The Cave Culture of Arkansas.* Explorations and Field Work of the Smithsonian Institution in 1931, pp. 159-168. Washington, D.C.

Waters, Gene
1973 A Burial from Salt Peter Shelter. *The Arkansas Archeologist* 14(1):13-18.

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

Williams, Ishmael, Randall L. Guendling, and W. Fredrick Limp
1986 *Archeological Testing of the Elk Track Site (3NW205) and the Webb Branch Site (3NW206), Buffalo National River, Arkansas*. Arkansas Archeological Survey, Sponsored Research Program, Project No. 604. Submitted to the National Park Service, Southwest Region, Santa Fe, New Mexico, Contract No. PX7029-6-0279.

Wolfman, Daniel
1979 *Archeological Assessment of the Buffalo National River*. Arkansas Archeological Survey Research Report No. 18. Fayetteville.

Wood, W. Raymond
1963 Breckenridge Shelter--3CR2, an Archeological Chronicle in the Beaver Reservoir Area. In *Arkansas Archeology 1962*, edited by Charles R. McGimsey III, pp. 67-96. Arkansas Archeological Society. Fayetteville.

Wood, W. Raymond, and R. Bruce McMillan (editors)
1963 *Prehistoric Man and His Environments: A Case Study in the Ozark Highlands*, Academic Press, New York.

Wyckoff, Don G.
1985 The Packard Complex: Early Archaic, Pre-Dalton Occupations on the Prairie-Woodlands Border. *Southeastern Archaeology* 4(1):1-26.

Yakubik, Jill-Karen, Herschel A. Franks, Susan C. Vehik, and J. Douglas Heffington
1988 *Archeological Survey of 649 Acres in the Boxley Valley, Buffalo National River, Newton County, Arkansas*. Earth Search, Inc. Submitted to National Park Service, Santa Fe, New Mexico. Contract No. CX7029-7-0011.

Young, S.D.
1975 *Stratigraphy and Petrology of the Lower Atoka Formation in the Lee Creek Area of Washington County, Arkansas*. Master's Thesis, Department of Geology, University of Arkansas, Fayetteville.

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APPENDIX A:

BOXLEY TESTING ANALYSIS

STATE SITE NO. 3NW____ PROVENIENCE_____ DEPTH_____
NPS NO. BUFF_____ ACCESSION NO. 88-_____ FSN_____

LITHICS	BO	L#	PI	L#	OC	L#	SI	L#	SS	L#	OS	L#	Sub-T
A													
W													
M													
PP/K TIPS													
PP/K MIDSECT													
PP/K BASE (Unid)													
BIFACE													
UNIFACE													
PREFORM													
HAMMERSTONE													
PITTED COBBLE													
UTILIZED FLAKE													
SUB TOTAL													
CORES AND FRAGS													
TESTED COBBLE													
PRIMARY DECORT.													
SECOND. DECORT.													
INTERIOR FLAKE													
FLAKE FRAGMENT													
PREFORM THINNING													
BIFACE THINNING													
PRESSURE FLAKE													
SUB TOTAL													
FCR													
UNMOD. COBBLE													
UNMOD.ANG.FRAG.													
TOTAL													

CERAMICS	rim	L#	body	L#	base	L#	TOTAL
Grog Tempered							
Shell Tempered							
TOTAL							

BONE	UNB	L#	Burned	L#	TOTAL
Deer					
Unid					
TOTAL					

HISTORIC	CT	L#	TOTAL
Unid. Metal			
Whiteware			
Glass			
Nail			
TOTAL			

NUTSHELLS	WT	L#	TOTAL
Hickory			
Walnut			
Unidentified			
TOTAL			

CHARCOAL	X	L#

BURNED CLAY	CT	L#	TOTAL
TOTAL			

TOTAL ARTIFACTS _____

APPENDIX B: Lithic Definitions

by

Robert A. Taylor

Projectile Point/Knife Tips (PP/K TIPS): These are distal blade portions, including the tip, of bifaces other than preforms. These fragments are usually not diagnostic of a particular cultural stage, but may be diagnostic of a general use (if serrated, or otherwise flaked/resharpened in a diagnostic way).

For whole projectile point/knives (PP/K's) thought to be Archaic (A), Woodland (W) or Mississippian (M), a type name if known or a general description was written on the analysis sheet. Portions of bifaces other than preforms which have symmetrical blades, acute edge angles, and/or evidence of hafting 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. Fragments are counted under the appropriate portion (tip, midsection or base). Small, thin, hafted bifaces, usually less than 40 mm long and 5mm thick, were presumably used as arrowpoints and are listed as Mississippian types.

Projectile Point/Knife Midsections (PP/K MIDSECT): This category includes the medial portions of bifaces (other than preforms) which lack both the distal tip and the base. These are usually not diagnostic of cultural stages but may represent kinds of use by their patterns of wear.

Projectile Point/Knife bases, unidentified (PP/K BASE (Unid)): These are basal portions of bifaces that lack diagnostic features such as shoulders or notches. They usually are not identifiable to use category.

Biface: These are artifacts which have been modified on two faces to form a working edge. They all lack hafting elements but may show evidence of use. They are unidentifiable as to specific type.

Uniface: These are artifacts which have been intentionally modified on one face to form a working edge. Usually they lack hafting elements. This category would include scrapers and spokeshaves, however, no artifacts were assigned to this class during laboratory analysis. Because of the difficulty in distinguishing intentional retouch from use retouch, all artifacts which might have been assigned to this class were sorted instead as "Utilized Flakes".

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. Many retain obvious hindrances to further reduction, such as thick projections or flaws in the raw material.

Hammerstone: These are cobbles that show battering or abrasion on convex edges. Usually, the heavier the battering, the more nearly spherical the specimen. Fragments of cobbles that show the edge battering or characteristic interior fractures along multiple cones of force are counted in this category.

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.

Utilized 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 surface, plowzones, or backhoe units are not counted as utilized unless the secondary retouch is extensive or otherwise determined to be intentional. This definition subsumes the class "Uniface" which was not used during the Boxley analysis although it appears on the analysis sheet. None of the retouch on Boxley specimens was distinctive enough to be definitely attributable to intentional shaping.

Cores and Core Fragments (CORES & FRAGS): These are cobbles with at least two flakes removed, usually more. Most have two prepared platforms for removal of flakes, and those used more extensively are completely decorticate and have the appearance of truncated polyhedrals. Identifiable fragments, including large flakes retaining much of the striking platform, are counted in this category.

Tested Cobble: These are cobbles of a sufficient size to serve as cores, usually patinated cherts, which have one flake removed, as if they were being tested for chippable qualities.

Flakes of Primary Decortication (PRIMARY DECORT.): These are flakes of any size which retain cortex on 90% or more of their obverse surface. The percentage of cortex was estimated during lab analysis without the aid of measuring devices.

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 Flake: These are flakes with no cortex, or with cortex only on the portion of the striking platform retained at the proximal end, that do not have the characteristics of 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. 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.

Flake Fragment: Any flakes which, because they have been broken, lack the proximal end and striking platform are counted as flake fragments. If the striking platform is merely crushed, the specimen is counted as a whole flake. A few flake fragments retaining cortex on the dorsal surface were counted as decortication flakes.

Preform Thinning: These are thin 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: 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. This is a more strict category than Preform Thinning, representing resharpening of a functional tool rather than tool production, and questionable biface thinning flakes are counted as Preform Thinning.

Pressure Flake: 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.

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. Although an effort was made to sort Boone, Pitkin, gray chert and siltstone which had been burned, these materials could not always be distinguished from each other during analysis and specimens of all four were sometimes combined in the class "Other Chert".

Unmodified Cobbles (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. Fragments which were estimated to represent more than half of a cobble were also counted here.

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 and multiple interior surfaces but no obvious indications of thermal alteration. If all surfaces of an angular fragment were weathered, rounded or chalky, the specimen was discarded as residual chert and was not counted in any class.

CLASSES OF RAW MATERIALS

The following are descriptions of the classes of raw materials used in the analysis of the lithics from the prehistoric sites in the Boxley Valley. Lithic artifacts were sorted by material type because differences in the frequency of raw materials may be related to differences in the availability of chert resources or to cultural biases. 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 testing phase analysis and for planning research designs that may incorporate lithic resource studies. The abbreviations used on the Boxley Analysis Form follow the class name.

Boone Chert (BO): Only white, whitish and pinkish white cherts are included in this class even though other colors are common in the Boone Formation which is immediately proximal to all three sites investigated during this project. Boone chert sometimes has a white, pinkish white or brownish white cortex and often exhibits a chalky, weathered appearance. Some pinkish specimens with high luster are believed to have been heat treated.

Pitkin (PI): This is a black or blue-gray chert without mottling, that may be non-concentrically banded. Black cherts with translucent mottles or with thin, high-contrast bands were not counted in this class. Some flakes may have tiny reddish-brown pits in the surface. Pitkin chert occurs in the Pitkin Limestone eroded by the headwaters of the Buffalo River and is available as gravels in the river. The cortex is black or gray and somewhat lighter than the interior color (Erwin 1972:3). Some specimens counted as Pitkin chert showed gradations from fine textured black chert to a coarser texture and brown color in a single artifact. See further discussion in the definition of siltstone below. Some black chert collected from Feature 2 at 3NW663 and classified as Pitkin had small white fossil inclusions.

Other Chert (OC): This chert included gray, green, and brown cherts and the highly mottled Reed Springs variety. This class may represent variants of Boone chert that are distinctive because of the unique proportions of mineral inclusions in the local limestone. Some non-local cherts may also be included in this class.

Siltstone (SI): Siltstone (formerly called argillite in the archeological literature) is a dark brown or gray to black grainy, but well cemented silt which possesses a concoidal fracture pattern. The material is derived from under the Atoka formation in the Trace Creek member of the Boyd formation above the Kessler limestone (Young 1975, Manger 1974, Jurney 1981). It is found in cobble or gravel bars or in outcrops in the area north of and between Ozark, Arkansas and Wagner, Oklahoma (Jurney 1981). During the Boxley analysis, it was noted that many specimens sorted as siltstone had the same texture and nearly the same color as some specimens sorted as Pitkin chert. On several specimens it was observed that Pitkin chert grades from a fine and glossy textured black chert into a coarser and browner material indistinguishable from siliceous siltstone. Individual specimens showing this gradation were counted as Pitkin chert. Only the larger flake specimens, specimens retaining cortex, and large artifacts such as hoes and choppers could be confidently classified as siltstone. Some specimens of limonite from Test Unit 6 at 3NW662 were included in the siltstone counts.

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 sandgrains. Exterior colors are usually brown or reddish brown.

Other Stone (OS): Any lithic material not readily identifiable as chert, siltstone or sandstone is included in this class. A few specimens of orthoquartzite were present in the collections and were counted as "Other Stone". Orthoquartzite stone is whitish with clear, rounded quartz sand grains in a translucent whitish matrix. The stone is well cemented with a siliceous matrix and fractures through the quartz sand grains.

Specimens of hematite were also counted as other stone. Hematite is a common form of iron oxide of variable hardness that is red to black in color, streaks red or reddish brown, and occurs in many crystalline forms (Rolingson and Kaczor 1987:55). During the Boxley analysis only red specimens of low hardness were observed. Some of these exhibited striations and smoothing indicating use as a source of pigment.

APPENDIX C: Measurements of Lithic Diagnostic Artifacts.

THE LUALLEN SITE (3NW662)

Table C1. Measurements of Arrowpoints, 3NW662.

FSN	LENGTH	WIDTH	THICKNESS	WIDTH STEM/BLADE	WIDTH BLADE	LENGTH STEM
Reed Arrowpoints						
29-1	27	12	2.9	9	13	6
31-1	17	9	3.2	6	10	5
115-4	26	11	3.9	7	10	6
116-3	-	-	-	-	11	-
Rockwall Arrowpoints						
9-1	15	>16	2.8	6	7	5
44-1	-	15	3.0	5	7	7
Sequoyah Arrowpoint						
68-1	21	13	4.0	4	6	6
Shetley Arrowpoint						
3-3	20	10	3.2	10	9.2	7
Arrowpoint Preform						
27-1	24	12	4.0	no haft		
Nodena-like Arrowpoint						
40-1	20	9	2.5	no haft		
75-1	24	10	3.2	no haft		
Untyped, aberrant Arrowpoint						
37-1	40	13	6.1	5	7	8

Table C2. Measurements of the Gary Projectile Points, 3NW662.

Abbreviations Used: pt=pointed base; rd=rounded base; b=broken.

FSN	LENGTH	WIDTH	THICKNESS	WIDTH STEM/BLADE	BASE FORM	LENGTH STEM	SHOULDERS
38-1	46	22	9.6	18	pt	18	very weak
117-3	48	32	6.0	18	rd	15	strong
67-1	65	31	8.7	22	rd	21	weak
114-2	>32	25	6.8	16	rd	15	1weak,1strong
32-1	59	20	9.2	13	rd	21	very weak
114-1	>44	23	8.1	15	pt	21	weak
47-1	63	25	7.6	19	rd	19	very weak
1-1	51	25	11.4	16	rd	18	very weak
118-3	>41	22	7.7	16	pt	19	very weak
118-2	69	27	9.7	21	pt	25	very weak
1-2	58	28	9.0	19	rd	20	very weak
118-1	>48	-	10.4	-	rd	18	strong
46-1	44	25	8.0	14	-	>11	1strong,1gone
1-3	-	36	7.6	20	b	>19	stong
41-1	>39	42	8.4	22	b	>15	strong
116-1	>54	29	7.2	18	b	>12	weak
121-2	>29	22	7.7	15	rd	13	weak
117-1	72	20	7.2	14	rd	18	weak
121-1	43	24	8.1	18	rd	15	weak
115-2	stem only-no measurements						

Table C3. Measurements of the Untyped Projectile Points, 3NW662.

FSN	LENGTH	WIDTH	THICKNESS	WIDTH STEM/BLADE	WIDTH BLADE	LENGTH STEM
Untyped Corner/Basal Notched						
22-1	37	34	6.5	18	22	13
42-1	59	40	6.7	19	22	15
Untyped Corner Notched						
1-4	59	33	9.4	19	24	13
3-1	-	25	8.3	15	-	12
17-1	-	27	9.2	15	20	11
21-1	-	-	>9.0	18	23	12
1-5	>31	25	7.4	15	21	14
3-2	-	-	<8.0	18	22	12
16-1	69	20	8.8	12	16	12
Untyped Straight to Slightly Expanded Stem						
4-1	-	24	11.0	15	16	13
6-1	37	23	12.4	13	14	11
20-1	72	31	10.7	19	22	14
28-1	44	25	8.9	12	12	11
36-1	-	27	8.2	18	19	12
83-1	>39	19	5.9	7	7	8
130-1	-	23	6.0	13	>13	7
Untyped Contracting Stem						
121-3	-	25	8.3	13	10	12
Untyped Shallow Side Notch						
115-1	53	26	10.2	24	26	12
115-3	42	24	7.3	15	17	9

Table C4. Measurements of the Projectile Points, 3NW663.

FSN	LENGTH	WIDTH	THICKNESS	WIDTH STEM/BLADE	WIDTH BLADE	LENGTH STEM
Packard Lanceolate						
13-1	68	22	9.7	21	16	25
Lanceolate, Untyped						
14-1	-	-	8.4	23	20	22
25-2	42	26	7.0	26	24	15
Big Sandy Side Notched						
44-1	-	35	10.5	25	35	20
72-1	53	32	9.1	22	28	18
Side Notched, Untyped						
25-1	49	25	9.5	20	28	17
Stone Square Stem						
45-1	45	30	6.9	20	19	16
Untyped Stemmed, reworked						
34-1	40	42	7.4	20	27	15

APPENDIX D: Artifacts Observed in the Plowed Transects.

THE EDGMON SITE (3NW661)

Table D1. Artifacts Observed in the Plowed Transects, 3NW661.

Plowed Transect 1 (west to east)

DISTANCE	DESCRIPTION	CT
118	flakes	1
124	flakes	1
132	flakes	1
143	flakes	1
151	flakes	1
153	flakes	1
162	flakes	1
173-177	flakes	8
177-180	flakes	4
182	flakes	1
184	flakes	1
187	flakes	1
194	flakes	1
195	flakes	1
198	flakes	1
203	flakes	1
204	flakes	1
209	flakes	1
210	flakes	2
218	flakes	1
254	flakes	1
260	flakes	1
279	flakes	1
293	flakes	1
293 FSN 1	arrowpoint pref	1
298	flakes	1
314	flakes	1
316	flakes	1
317	flakes	1
318	flakes	1
341	flakes	1
386	flakes	1
391	End of PT1	
	total	43

Plowed Transect 2 (south to north)

DISTANCE	DESCRIPTION	CT
0-10	historic	2
62	flake?	1
94	End of Plowed Transect 2	
	total	3

Plowed Transect 3 (south to north)

DISTANCE	DESCRIPTION	CT
9	flakes	1
13	flakes	1
15	flakes	1
21	flakes	1
23	flakes	1
56	flakes	1
58	flakes	1
68	flakes	1
69	flakes	1
71	flakes	1
75	flakes	1
77	flakes	1
78	flakes	1
80	flakes	1
85	flakes	1
90	End of Plowed Transect	3
	total	15

Plowed Transect 4 (south to north)

0-5	flakes	6
10.5	flakes	1
26	flakes	1
28	flakes	1
54	flakes	1
75-80	flakes	3
75-80	hammerstone	1
75-80	historic	1
81	End of Plowed Transect	4
	total	15

Plowed Transect 5 (south to north)

DISTANCE	DESCRIPTION	CT
1	preform	1
17	flakes	1
31	flakes	1
35	flakes	1
37 FSN 2	flake scraper	1
93	End of Plowed Transect	5
	total	5

Table D2. Artifacts Observed in Plowed Transects A-E, 3NW662.

Transect A (east to west)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER CHERT
0-3	flakes	2	15	1		
0-3	hammerstone		1			
0-3	preform			1		
3-6	flakes	3	8	3		
3-6	hammerstone		1			
6-9	flakes	3	7			
6-9	preform	1				
9-12	flakes	5	4			
12-15	flakes	2	4	1		2
15-18	flakes	2	2			
18-27	0					
27-30	flakes		4			
30-33	flakes		1			
33-36	flakes		1			1
36-42	0					
42-43	flakes	1	1		1	
48	flakes		1			
53	flakes	1	2			
56-59	flakes	2	1			
56-59	pp/k frag		1			
59-69	0					
69-71	core/tested cob	1	1			
71-74	0					
74	flakes			1		

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER CHERT
81-84	flakes		2			
81.5	Low Area with gravels					
85-88	flakes		4			
88-90	0					
90-93	flakes	5	3			
93	tested cob/core		1			
94	Gravels on surface to end of transect					
93-96	flakes	1	9			1
97-100	flakes	3	15			
97.7FSN24	arrowpoint	1				
100-103	flakes	1	4			
103-106	flakes	1	8			
106-109	?					
109-112	flakes	5	4			
109-112	core	1				
109-112	biface		1			
112-115	flakes	1	3			
115-118	flakes		2			

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
118-121	flakes	1	1				
121-124	flakes	1	2				
124-127	flakes		2				
127-130	flakes		1				
136.5	flakes		1				
143-147	Plowed Transect A crosses Plowed Transect E						
146.3	flakes		1				
147.3	flakes		1				
154.1	flakes		1				
160.5	end of Plowed Transect A						
	total	43	121	7	1	4	297

Transect B (west end to east end)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
1.0	flakes		1				
4.0	flakes		1				
4.6	flakes		1				
5.7	flakes		1				
9.8	flakes			1			
13.8	flakes	1	2				
14.0	flakes	1					
14.4	preform	1					
20.9	flakes		1				
23.5	preform		1				
24.4	flakes		1				
25.35	flakes		1				
25.8	flakes		1				
26.35	flakes		1				
26.55	flakes		2				
27.7	flakes		2				
28.2	flakes		2				
28.4	flakes		1				
30.60	flakes		1				
31.1	flakes		1				
31.7	flakes		1				
31.8	flakes		1				
32.5	flakes	2	1				
34.0	flakes		1				
35.3	flakes		1				
35.9	preform		1				
36.4	flakes	1	1				
36.7-37.8	flakes		2				

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
37-40	flakes	2	10				
39.5	preform		1				
40-43	flakes	8	19				
40.4	pp/k tip			1			
43-47	flakes	8	23				
45.8	preform		1				
46.3	preform	1					
47-49	flakes	11	14				
49-52FSN3	Controlled Collection Unit						
52-55	flakes	16	35				
54.2 FSN4	pp/k base			1			
53	pp/k tip		1				

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER CHERT
55-58	preform		1			
55-58	flakes	26	54	3		1
58-61	flakes	34	43	5		2
61-64	flakes	22	49		2	1
61-64	core/tested cob		1			
61-64	hammerstone				sandstone	
61-64	preform	1				
64-67	flakes	19	29	2	1	
65.6 FSN5	drill		1			
64-67	core frag		1		1	
67-70	flakes	16	18			3
70-73	flakes	5	15			
71.8	preform			1		
71-74	Plowed Transect B crosses Plowed Transect C					
73-76	flakes	8	19	1		
76-79	flakes	4	8			
77.6	preform,early stage		1			
76.9	core/thk biface1					
79-82	flakes	6	15			
79.8 FSN6	pp/k		1			
81.75	preform,early stage		1			
80.2	preform tip				1	
82-85	flakes	6	13			
84.9 FSN7	chipped stone ax		1			
85-88	flakes	10	17	2		
DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER CHERT
88-91	flakes	9	14	2		
91 FSN8	pp/k		1			
91.5 FSN9	arrowpoint	1				
91-94	flakes	14	9	3	1	
94-97	flakes	12	15	1		
94-97	pitted cobble				sandstone	
94.6FSN10	chopper/hoe?				1	
97-100	flakes	4	15			
99.9	hammerstone		1			
100-103	flakes	5	16			
100-103	testedcob/core	2	3			
103-106	flakes	9	13			
106-109	flakes	10	7			
106-109	tested cob/core		1			
109-112	flakes	4	6		2	
112-115	flakes	4	5			
116.25 FSN11	shell tempered sherd					
115-118	flakes	4	7			
118-121	flakes	2	2			
118-121	tested cob/core		1			
121-124	flakes	2	2			
124-127	flakes	2				
127-130	flakes		1			
130-133	flakes	2	4	2		
133-136	flakes	1				
136-139	flakes	1	4			
139.1	flakes	1				

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
139.2	flakes	1					
140.2	End of Plowed Transect B						
	total	442	549	25	10	7	1582

Plowed Transect C (north end to south end)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
7-10	flakes	3	6	1			
10-13	flakes	7	9				
13-16	flakes	2	12				
16-19	flakes	2	11		1		
19-22	flakes	1	16				
19-22	preform/core		1				
20.6	pitted cobble				1	sandstone	
22-25	flakes	2	1				
22-25	preform		3				
25-28	flakes	3	14	1			
25-28	preform	1					
26.2FSN12	core		1				
28-31	flakes	7	24				
28-31	core/chopper	1					
31-34	flakes	4	21				
31-34	preform		1				
34-37	flakes	3	13				
34-37	preform		1				
37-40	flakes	5	9				
40-43	flakes	9	25				
40-43	core frags		2				
40-43	biface		1				
43-46	flakes	10	29				
43-46	core		1				
43.2FSN14	pp/k						
46-49	flakes	23	46				
46-49	core	1					
46-49	preform		1				
49-52	flakes	9	39	3			
49-52	preform		1				
52-55	flakes	16	28	2			
52-55	core		1				
52-55	preform		2				
55-58	flakes	15	39	3			
55-58	preform	1	1				
58-61	flakes	17	35	2			
60.6FSN15	arrowpoint tip						
61-64	flakes	25	53	2			
61-64	pp/k tip		1				
62.7FSN16	pp/k						
64-67	flakes	12	28	3			
67-70	flakes	21	38	2			
67-70	core	1					
70-73	flakes	11	24	1			
73-76	flakes	11	32	4			
73-76	core	1	1				

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
76-79	flakes	18	33	1			
76-79	pp/k tip						
79-79.9	flakes	5	10				
79-79.9	core	2					
79.9-83	Plowed Transect C crosses Plowed Transect B						
83-86	flakes	24	31	6			
83-86	core		1				
DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
86-89	flakes	33	22	5			
87.9FSN17	pp/k						
88.6FSN18	arrowpoint						
89-92	flakes	26	45	9			
89-92	biface			1			
92-95	flakes	15	29	5			
92-95	core	1					
95-98	flakes	25	38	5			
95-98	core	1	1				
98-101	flakes	19	22	5			
98-101	biface			1			
98-101	core	1					
101-104	FSN 19 Controlled Surface Collection						
104-107	flakes	19	28	1			
104-107	core		1				
107-110	flakes	28	31				
110-113	flakes	23	32				
110-113	core	1					
113-116	flakes	29	42	1			
113-116	core	1	1				
116-119	flakes	24	53	5			
116-119	core	1	1				
118.9	pp/k frag	1					
119-122	flakes	26	42	3			
119-122	core	1	2				
122-125	flakes	44	61	5			
122-125	cores	6	2				
122.2FSN20	pp/k						
124.3FSN21	pp/k base	1					
125.1FSN22	pp/k	1					
125-128	flakes	19	32	2			
125-128	preform		2				
128-131	flakes	17	45				1
128-131	preform	1					
128-131	tested cob/core				1		
DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
131-134	flakes	17	38	3			
134-137	flakes	17	35	2			
134-137	preform		3				
137-140	flakes	17	21	4			
137-140	core		2				
137-140	biface frag	1	1				
140-143	flakes	14	29				
140-143	preform	1					
140-143	core		2				
142.4FSN23	pp/k base	1					

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
143-146	flakes	18	25	5			
143-146	preform		1				
146-149	flakes	17	31		3		
146-149	preform		1				
146-149	tested cob/core		1				
147.6FSN24	pp/k base		1				
149-152	Terrace edge						
149-152	flakes	14	36	4			
149-152	core				1		
152-155	flakes	6	7				
152-155	tested cob/core		1				
155-158	flakes	2	8				
155-158	tested cob/core		2				
155-158	preform		1				
155-158	pp/k tip		1				
158-161	flakes	3	20				
158-161	preform		1				
158-161	core	1					
161-164	flakes	4	20			1	
161-164	core	1					
164-167	flakes	10	14				
167-170	flakes	4	8				
167-170	preform		1				
167-170	core	1					
170-173	flakes	3	9	1			
173.5 Beginning of dark organic backswamp? sediments to end PTC							
173-176	flakes		6				
176-179	0						
182.2	flakes		1				
184	flakes		1				
184.4	flakes		1				
185.8	flakes		1				
198.4	flakes		1				
204	End of Plowed Transect C						
	total	787	1508	98	6	2	2401

Plowed Transect D (south end to north end)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
7	flakes	1					
9.4-10.4	flakes		5				
11.5	flakes	1					
15.9	flakes		1				
19.4	flakes		2				
22.4	flakes		1				
25.4	flakes		2				
27.2	flakes		1				
29	flakes		1				
39	flakes		1				
46.5	flakes			1			
47	flakes		1				
47.8	flakes		1				
49.9	flakes	1					
51.3	flakes	1					
52.9	flakes		1				
	total	4	17	1			22

Plowed Transect E (portion from north end toward south)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
3.4	preform	1					
5	Plowed Transect E crosses Plowed Transect C						
11.6	flakes		2				
22.6	flakes		1				
23.4	flakes		1				
26-29	flakes	1	4	2			
DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY	SILTSTONE	OTHER	CHERT
26-29	core	1					
29-32	flakes	5	4	1			
29-32	core		2				
32-35	flakes	2	3	1			
32-35	biface			1			
34.8FSN25	hoe				1		
35-38	flakes	2	3	1		1	
38-41	flakes	2	4	1			
38-41	biface frag	1					
41-44	flakes	4	6				
44-47	flakes	5	10				
47-50	flakes	4	5				
50-53	flakes	2	10				
50-53	tested cob.core	1					
53-56	flakes	7	12				
53-56	preform	1					
56-59	flakes	5	10				
59-62	flakes	7	12	3			
62-65	flakes	9	11				
65-68	FSN26 Controlled Surface Collection						
68-71	flakes	13	23	2			
68-71	flake scraper			1			
71-74	flakes	13	17	2			
71-74	cores	3					
74-77	flakes	10	23	2	1		
74-77	pp/k tip	1					
74-77	preform		1				
77-80	flakes	16	29	2		1	
77-80	core	1	1				
77-80	1 bird bone						
78.7FSN27	arrowpoint		1				
	total	107	195	19	2	2	325

Table D3. Artifacts Observed in the Plowed Transects, 3NW663.

Transect A (east to west, terrace)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY		
2.4	preform		1			
3.5	flakes		1			
4	flakes		2			
4.5	flakes		3			
5.7	pitted cobble				sandstone	
6.7	flakes		1			
7.8	flakes		1			
9.3	flakes		1			
9.5	flakes		1			
9.7	core		1			
10.2	flakes		1			
13.1	flakes		1			
13.7	flakes		2			
14.8	flakes			2		
17	flakes		1			
17.7	thick biface			1		
19.7	flakes		2			
20	terrace edge					
	total		22	3		25

Plowed Transect B (east to west, terrace)

DISTANCE	DESCRIPTION	CT
11.8	flake	1
12-15	flakes	4
15-18	0	
18-21	flakes	3
18-21	whiteware	1
25.9	flakes	1
33.5-36.5	flakes	5
40.5	flakes	2
42.7	flakes	1
54.2	flakes	1
54.2	pp/k frag	1
59.1	flakes	2
69.1	flakes	1
71.2	flakes	1
78.7	flakes	2
79.5	flakes	1
85.2	flakes	1
87.9	flakes	1
101.6	flake	1
107.6	flake	1
139.6	flake	1
146.2	flake	1

DISTANCE	DESCRIPTION	CT
149.5	flake	1
174.9	flake	1
190.7	core	1
191.2	flake	1
224.2	flake	1
246	flake	1
250.6	flake	1
268	flake	1
269	flake	1
275.4	flake	1
282.3	flake	1
401	flake	1
413	flake	1
420	West end of PTB	

Plowed Transect C (south to north of fence, terrace)

DISTANCE	DESCRIPTION	CT
9.2	pp/k frag	1
35.9	flake	1
47.5	flake	1
120.7	pp/k tip	1
134.5	flake	1
138.4	thick biface	1
158.8	flake	1
176.2	flake	1
186.4	biface frag	1
193.8	flakes	4
198.2	flakes	1
198.7	pp/k	1
199	End of terrace	

Plowed Transect D (south to north, terrace)

DISTANCE	DESCRIPTION	CT
21.7	flake	1
42.9	flake	1
48.2	preform	1
64.5	flake	1
76.3	pp/k	1
114.3	flake	1
184.9	preform	1
196.9	flake	1
198.7	flake	1
199.3	flake	1
200.9	flake	1
222	North Edge of Terrace	

Plowed Transect E (south to north, terrace)

DISTANCE	DESCRIPTION	CT
73.9	flake	1
100.5	flake	1
102.1	flake	1
103	flake	1
111.1	flake	1
159.3	flake	1
210	Edge of Terrace	
TOTAL ON TERRACE		100

Plowed Transect A (west to east from PTC, floodplain)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY
19.3	flakes			1

Plowed Transect A (west to east from PTE, floodplain)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY
9.7	flakes			1
28.2	flakes			1

Plowed Transect A (east to west from PTE, floodplain)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY
15.7	flakes		1	
32.5	flakes			2
37	flakes		1	

Plowed Transect C (south to north from intersection of PTA, floodplain)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY
42	flakes			1

Plowed Transect D (south to north from intersection of PTA, floodplain

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY
11.5	flakes		1	
18.9	flakes			1
21.1	flakes		1	
32.4	flakes		1	
42.5 FSN	thick biface			
46.3	flakes			1
52.4 FSN	pp/k		1	
98.9	flakes			1

Plowed Transect E (north to south from intersection of PTA, floodplain)

DISTANCE	DESCRIPTION	PITKIN	BOONE	GRAY
3.8 FSN	pp/k	1		

TOTAL ON FLOODPLAIN	1	6	10	17

APPENDIX E:

SCOPE-OF-WORK

ARCHEOLOGICAL TESTING FOR A DETERMINATION OF SIGNIFICANCE AT THREE SITES ON THE LUALLEN, SATTLER, AND EDGMON TRACTS WITHIN THE BOXLEY VALLEY PORTION OF BUFFALO NATIONAL RIVER NEWTON COUNTY, ARKANSAS

1. INTRODUCTION

The National Park Service (NPS), Buffalo National River, is proposing to have archeological testing conducted at three sites in Boxley Valley within Newton County, Arkansas (Figure 1). The work is to be accomplished prior to planned sell back of the three identified parcels of land currently referred to as the LuAllen (66-113 and 66114), Sattler (63-107), and Edgmon (67-101) tracts. The sites were surveyed in 1985 and their general boundaries established at that time. However, adequate information on their exact size, depth, nature and significance is not available. The testing program is designed to acquire sufficient information about the sites in order to make a determination of significance relevant to the criteria for the National Register of Historic Places.

The fieldwork will consist of a combination of controlled excavation units, prudent use of mechanized equipment for disking, trenching and stripping larger areas, as well as shovel tests and/or auger holes in order to determine the size, depth, character of deposits, and disturbances to the three sites involved.

The fieldwork will be immediately followed by a Management Summary, analysis of the recovered materials and a final report which detail results of the field investigations and recommend management alternatives for the sites. The specifics of the project are enumerated in Section 4 below entitled Statement of Work.

The work defined herein is to be performed in accordance with this scope of work under the authorities of the Antiquities Act of 1906, the Historic Sites Act of 1935, the National Historic Preservation Act of 1966 (as amended in 1980), P.L. 94-422, and in conformance with approved policies and standards of the National Park Service and the State Plan for the Conservation of Archeological Resources in Arkansas (the State Plan).

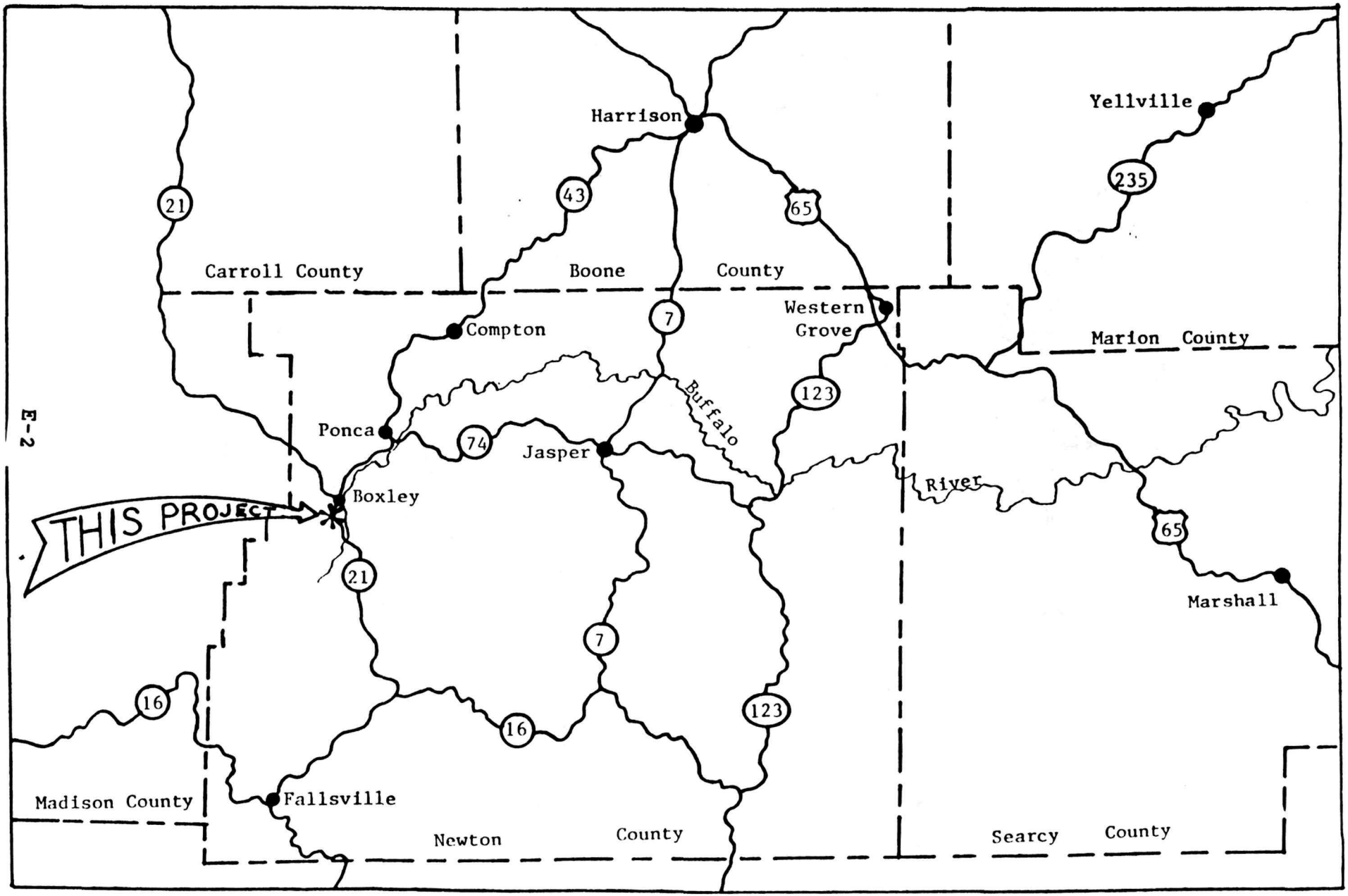


Figure 1: Map depicting the location of the project within Newton County, Arkansas.

2. LOCATION

The three archeological sites are located in Boxley Valley within the upper reaches of Buffalo River in the west-central portion of Newton County, Arkansas (Figure 2). Specifically, the respective sites are located by the following descriptions based on the Boxley, Ark. USGS 7.5 minute quad map:

LuAllen Site (Tracts 66-113, 114):

Edgmon Site (Tract 67-101):

Sattler Site (Tract 63-107)

3. BACKGROUND

The National Park Service, under the authority of the Code of Federal Regulations, Part 17 - Conveyance of Freehold and Leasehold Interests on Lands of the National Park System, intends to sell back into private ownership the three parcels of land described above. Prior to such an undertaking, however, all subject lands are required to be surveyed for cultural resources and all identified cultural resources shall be evaluated for significance relative to the criteria of the National Register of Historic Places.

The tracts of land under consideration here were surveyed for archeological and historical resources in the summer of 1985. The contract to conduct this work was let under an inter-agency agreement with the Tennessee Valley Authority. At that time, one prehistoric archeological site was located on each of the three tracts of land (Figures 3-5). The sites vary in size but appear to be quite similar in character. The LuAllen Site is 30 acres in size, the Edgmon Site is 10 acres in size, and the Sattler Site is 20 acres in size. However, the scope of work for that project was only directed at location and rough definition of the sites within these tracts; no funds were available for a determination of significance for the three sites. It is the need for such determinations of significance which brings about this project.

4. STATEMENT OF WORK

The purpose of these investigations is three-fold: 1) to better define the horizontal and vertical boundaries of the archeological sites as depicted in Figures 3-5, 2) to acquire sufficient information on the nature, age and depositional context of these sites to arrive at a determination of significance for each of the three archeological sites, and 3) offer recommendations on future management needs of these sites.

Fieldwork

A permanent datum shall be established for each site. This datum shall be established in a prominent location that will allow easy relocation. The location of all test units, backhoe trenches, strip backs, shovel/auger tests and all archeological features or deposits encountered shall be mapped relative to this permanent datum.

Item 1 above shall be achieved through a comination of disking, shovel/auger tests and controlled test units. The previous work in 1985 sufficiently defined the horizontal boundaries of the sites (Figures 3-5). However, adequate information on the vertical depth of the sites was not obtained.

Two tracts are currently under Agricultural Use Permit, (LuAllen 66-113), (Edgeman 67-101). Contractor will be required to make arrangements with permittee listed below prior to performing fieldwork to minimize impacts on his agricultural operations.

Dale Clark
Rt. 6, Box 322A
Springdale, Arkansas 72764
Phone: 501/442-4241

Disking. In this proposed work, a series of disked transects across the each site shall be accomplished. Each transect shall measure a minimum of ten feet across with the length varying according to the dimensions as depicted in Figures 6-8. Such action will provide the field investigators with an initial idea of where concentrations of artifacts occur. Based on information obtained through the disking pattern, a series of strip back areas, backhoe trenches and controlled test units shall be executed. A

All maps have been removed from the electronic edition in an effort to protect sensitive cultural resources.

minimum of each test unit type will be required as stated below. However, the exact location of each shall be at the field director's discretion, based upon the results of the disking and subsequent test units.

Trenches, Strip Backs and Controlled Test Units. According to patterns of artifact concentrations derived from the above process, and considering the topography of the site, particular areas that promise higher informational return will then be selected for further, more intense, investigation. These areas shall be exposed using backhoe trenches and strip back areas in order to study the archeological and geological deposits. Such an approach should result in the necessary data to achieve Item 2 above. Backhoe trenches shall each be no less than 3 meters in length and 2 meters in depth, and shall be placed so as to derive information on the geomorphology of the site, the cultural depositions contained within the site, and deep enough to determine depth and character of the cultural deposits. Strip back areas shall be a minimum of 5 meters on a side and as deep as necessary (up to 1 meter) to expose any intact cultural deposits that may exist below the plow zones. Controlled Test Units shall be a minimum of 1 meter on a side and shall be excavated in 10 centimeter levels to a minimum of 1 meter depth or until definite sterile soil is encountered. All soil removed shall be screened through 1/4 inch mesh and each level shall constitute a single provenience.

Shovel/Auger Tests. Additional shovel and/or auger tests shall be used to more precisely define site boundaries and/or areas of intact subplow zone deposits that may occur. The use of these additional tests shall be at the field director's discretion.

The use of all of the above testing techniques is required for this project. Aside from the prescribed location of the disking transects as shown in Figures 9-11, the location of the other testing techniques shall be dependent upon the in-field results and at the discretion of the field director. The minimum number of each technique, by site, is as follows:

LuAllen Site: 15,050 linear feet of disked transects as shown in Figure 6
4 backhoe trenches
9 strip backs
6 controlled test units
shovel/auger tests as necessary

Edgmon Site: 6,850 linear feet of disked transects as shown in Figure 7
4 backhoe trenches
6 strip backs
4 controlled test units
shovel/auger tests as necessary

Sattler Site: 2,600 linear feet of disked transects as shown in Figure 8
2 backhoe trenches
4 strip backs
3 controlled test units
shovel/auger tests as necessary

Analysis and Report Preparation

Immediately following the fieldwork, a Management Summary shall be submitted to NPS. This Management Summary shall describe the preliminary results of the field investigation, any conclusions drawn, and recommendations on clearance and any future management of the archeological sites.

Analysis of all collected materials, samples and documentation shall begin immediately upon completion of the fieldwork. These studies will result in the production of a draft report for review which will contain all pertinent information derived from the fieldwork and analyses, and the interpretation of all these data. This information will include a section on methodologies used in the field and laboratory work; a cultural history of the area; environment of the area; descriptions of any site features, artifacts and deposits recovered; interpretation of these materials; and a discussion of the conclusions drawn from this work. Following review and comment on the draft report by the NPS, a final report of publishable quality will be submitted by the contractor.

The contractor is expected to furnish all personnel, equipment, supplies and machinery necessary to conduct the fieldwork, analyses and report preparation. All fieldwork, laboratory analyses and report preparation shall be conducted in accordance with the State Plan, Appendix B and the final report shall adhere to the style guide of American Antiquity.

5. COLLECTIONS

All collections (defined as including all artifacts, specimens, material samples, plus all documentation in the form of notes, photographs, maps, plans, diagrams, computer tapes, disks, etc.) remain the property of the Federal Government. Upon the commencement of fieldwork that will produce collections, the field supervisor shall obtain an accession number from the park curator and all containers of specimens shall be labeled with that number. When leaving the field, all collections taken from the park shall be placed on loan by the park curator. The archeologist in charge shall provide the park with at least a simple box inventory, or a more complete inventory of materials, if possible. After the materials are processed, a

detailed inventory should be provided to the park curator and the project Contracting Officer's Technical Representative (COTR).

All materials recovered shall be cataloged to the registration level in accordance with the NPS Museum Handbook, Part II (see Appendix attached). The cataloging documentation may either be done by typewriter or computer. If done by computer, the contractor is required to have an IBM compatible computer and dBase III Plus software package. The NPS Regional Curator will provide the necessary Automated National Catalog System (ANCS) software package, the necessary NPS work sheets, and the NPS catalog cards (Standard Form 10-254, Revised) to the contractor. All computer disks used during cataloging shall be provided to the NPS upon completion of the job.

Collection materials must be kept in secure conditions in space during the period of analysis. Once the study has been completed, all collections must be placed in a permanent repository that meets NPS standards and to which the Park Superintendent agrees. All conservation work of specimens that goes beyond standard archeological cleaning should be approved by the Regional Curator, as is true of any destructive or consumptive methods of analysis that are not routine or already called for in the scope of work, contract or research design.

6. DELIVERABLES

The contractor shall provide the COTR with a Management Summary that contains a discussion as to why the work was undertaken, a summary of the scope of work, limitations encountered in carrying out the scope of work, the results and their significance, any recommendations on the management of the cultural resources encountered and the repository of the records and artifacts recovered.

Two copies of the Draft Final Report shall be submitted to the COTR for review by the NPS and the Arkansas State Historic Preservation Officer (SHPO). The NPS will distribute the draft report for review and will provide comments on the report to the contractor. This report shall be professionally prepared according to guidelines in the State Plan and done in accordance with the American Antiquity style guide.

Following review of the draft final report by the NPS and the SHPO, the contractor shall incorporate all comments and recommendations into a Final Report suitable for publication. If the report was authored by someone other than the contract Principal Investigator, the cover and title page shall bear the inscription "Prepared Under the Supervision of (Name), Principal Investigator." The title page of the report shall bear an

appropriate inscription indicating the source of funds used to conduct the work. A completed National Technical Information Service (NTIS) report documentation form (Optional Form 272, available from the NPS) shall be submitted with the final report. Twenty-five copies of this final report shall be delivered to the COTR, one copy of which shall be unbound and contain original photographs used in illustrations. This report shall meet the same standards as required for the draft report.

7. SCHEDULE

The fieldwork for this project shall begin within 15 calendar days from award of contract.

The fieldwork shall be completed within 36 calendar days from award of contract.

The Management Summary shall be submitted to the NPS within 10 days of completion of the fieldwork.

The analysis of all recovered materials and information, the cataloguing of all artifactual materials, and the preparation of the draft report for review shall be completed within 100 calendar days from award of contract.

The NPS and the SHPO will review and comment on the draft report for review within and return any comments within 40 days from receipt of the draft report.

The required number of final report copies incorporating all comments, as well as all catalogued artifacts and collections associated with the project shall be submitted to the COTR (NPS) within 15 calendar days from receipt of the comments by the NPS and SHPO.

8. PAYMENT

Payment for this project will be in three installments: one half of the total payable upon completion of the fieldwork; one quarter of the total payable upon receipt of the draft report for review; and one quarter of the total payable upon receipt of the required number of final report copies and all catalogued collections and materials produced for this project.

APPENDIX F: SOIL DESCRIPTIONS

by

Margaret J. Guccione

SATTLER SITE - HIGH TERRACE

TRENCH 2

Geomorphic Position: High terrace of Moore Creek (t-1b), near its confluence with the Buffalo River.

Soil Series: Spadra Soil Series

Elevation: 28.3 m above local base level.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0- 15	15	Ap	proximal overbank	Sandy loam with scattered granules; dark brown (10YR 3/4); granular; clear lower contact.
15- 35	20	AB		Loam with scattered granules; brown (7.5YR 4/4); moderate, fine, subangular blocky; clear lower contact.
35- 50	15	2Bt1	channel gravel	Gravelly loam (grain-supported gravel and granules); strong brown 7.5YR 5/6); moderate, fine, subangular blocky; clear to gradational lower contact.
50-110+	60+	2Bt2		Gravelly loam (grain-supported subrounded gravel and granules; yellowish red (5YR 5/6), reticulated red and gray pattern on gravel; weak, medium, subangular blocky; clay films and bridges.

SATTLER SITE - LOW TERRACE

TRENCH 1

Geomorphic Position: Low terrace of Moore Creek (t-1a) near confluence with the Buffalo River.

Soil Series: Spadra Soil Series

Elevation: 27.3 m above local base level.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0- 27	27	Ap	proximal overbank	Sandy loam; dark yellowish brown (10YR 4/4); granular to massive; clear lower contact.
27- 54	37	Bt1		Sandy loam: strong brown (7.5YR 4/4); weak subangular blocky, very weak clay films and few discontinuous Mn films; gradational lower contact.
64- 94	30	Bt2		Sandy loam: strong brown (7.5YR 4/4); massive; clear lower boundary.
94-100	6	2Ab	channel gravel	Gravelly sandy loam (grain-supported); strong brown (7.5YR 5/6); massive; clear lower boundary.
100-120	20	2BAb		Gravelly sandy loam (grain-supported); strong brown (7.5YR 5/6); massive; thin discontinuous clay films; clear lower boundary.
120-133+	13+	2Btb		Gravelly sandy loam (grain-supported); yellowish red (5YR 5/6); coarse angular blocky; clay films on and bridging subrounded to subangular gravel.

SATTLER SITE - FLOOD PLAIN

TRENCH 5

Geomorphic Position: Inactive flood plain of Moore Creek at the confluence of the Buffalo River.

Soil Series: Spadra Soil Series

Elevation: 26.9 m above local base level.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0- 29	29	Ap	chute channel fill or overbank	Sandy loam with few scattered pebbles; dark brown (10YR 4/3); granular; gradual lower boundary.
29- 76	47	Bt1		Sandy loam with few scattered pebbles; dark brown (7.5YR 4/4) with reddish brown (5YR 5/4) clay films; weak medium subangular blocky; gradational lower boundary.
76-114	38	Bt2		Sandy clay loam with scattered pebbles; dark brown (7.5YR 4/4) with yellowish brown (10YR 5/4) mottles; weak medium subangular blocky; very weak discontinuous clay films; clear lower boundary.
114-145+	31+	2C	channel gravel	Gravelly sandy clay loam, granules become coarser with depth, granules are angular and subangular, cobbles are subangular; dark brown (7.5YR 4/4); massive.

LUALLEN SITE - TRENCH 1

Geomorphic Position: Highest portion of Buffalo River flood plain, along east valley wall.

Soil Series: Razort Soil Series

Elevation: 10.1 m above local base level

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0- 20	20	Ap	chute channel sand	Sandy loam; very dark brown (10YR 2/2); granular; clear lower contact.
20- 51	31	Bt1	overbank	Loam; very dark brown (10YR 2/2); moderate, coarse, subangular, blocky; line of red fire-burned sandstone pebbles at 38 cm depth; weak, discontinuous clay films on peds; root pores; clear lower boundary.
51-101	50	Bt2		Loam; dark yellowish brown (7.5YR 4/4) with dark brown (10YR 4/3) on peds; coarse angular blocky; abrupt lower contact.
101-143	42	2C	channel sand	Sandy clay loam; dark brown (10YR 4/3); massive; clear lower boundary.
143-178+	35	3C	channel gravel	Gravelly sandy clay loam; (grain-supported gravel) dark brown (10YR 4/3); massive.

LUALLEN SITE - TRENCH 5

Geomorphic Position: Swale on Buffalo River flood plain.

Soil Series: Ceda Soil Series

Elevation: 8.0 meters above local base level.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0- 27	27	Ap	chute channel sand	Sandy loam; dark brown (10YR 4/3); granular.
27-106	79	C		Sandy loam; dark brown (10YR 3/3); massive.
107-200	93	2C	overbank	Sandy loam; dark brown (10YR 4/3); massive.
200-275+	75+	3C	channel gravel	Gravel and cobbles up to 27 cm diameter, subrounded, grain supported.

LUALLEN SITE - TRENCH 6

Geomorphic Position: Ridge (point bar) on Buffalo River flood plain.

Soil Series: Ceda Soil Series

Elevation: 8.8 meters above local base level.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0- 20	20	Ap	chute channel sand	Loamy sand, dark brown (7.5YR 4/4); massive.
20- 39	19	C		Loamy sand, dark brown (10YR 4/3); massive.
39- 74	35	2Bw?	channel sand	Sandy loam to loam; dark brown (7.5YR 3-4/2); very weak medium subangular blocky.
74-106	32	2C		Sandy loam, dark brown (10YR 3/3).
106-195	89	2C		Sandy loam; dark brown (10YR 4/3).
195-265+	70+	3C	channel gravel	Gravel, maximum diameter 30 cm, grain supported.

LUALLEN SITE - TRENCH 7

Geomorphic Position: Swale on Buffalo River flood plain.

Soil Series: Ceda Soil Series.

Elevation: 8.2 meters above local base level.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0- 21	21	Ap	channel sand	Sandy loam with few scattered pebbles, dark brown (10YR 3/3); granular; gradual lower boundary.
21- 50	29	Bw		Sandy loam, with few scattered pebbles; dark yellowish brown (10YR 3/4); massive; clear lower boundary.
50-133+	83	2C	channel gravel	Gravelly loamy sand (grain-supported, subrounded gravel); dark brown (10YR 4/3); massive.

LUALLEN SITE - TRENCH 8

Geomorphic Position: Rise on Buffalo River flood plain.

Soil Series: Ceda Soil Series.

Elevation: 10.1 meters above local base level.

Depth (cm)	Thickness (cm)	Horizon	Parent Material	Description
0- 28	28	Ap	channel sand	Loamy sand; dark yellowish brown (10YR 3/4); granular; clear lower boundary.
28- 86	58	C		Grain-supported gravel; bedded; dark brown (10YR 4/3); sharp lower boundary.
86-137	51	C		Sand; dark yellowish brown (10YR 4/4); massive; clear lower boundary.
137-180+	43	2C	channel gravel	Gravel, grain-supported; massive.

APPENDIX G: Project Personnel

PRINCIPAL INVESTIGATOR AND PROJECT DIRECTOR

Carol S. Spears

M.A. in Anthropology, 1978, University of Arkansas, Fayetteville, Arkansas
(Specialization in Southeastern Archeology and Cultural Resource Management. Graduate Assistantship from the Arkansas Archeological Survey.)

SOCIETY OF PROFESSIONAL ARCHEOLOGIST, certified

Over 15 years experience in archeology in Arkansas including projects distributed over the entire state (the Arkansas Archeological Survey and private organizations 1971-present). Also worked in: Missouri (bootheel and Ozark Mountains, 1980-1982); Illinois (Cahokia, 1973); Oklahoma (Ouachita Mountains, 1987); North Carolina (Directed the National Register and Public Education Programs for the Archeology Branch, Department of Cultural Resources, 1977-1980; and was Project Archeologist for a private firm on several large federal contracts 1982-1983); and in Yugoslavia (6 summers, 1976-1981, NSF Grant to Harvard Univ. & University of California, Berkeley).

From 1980-1986 Spears was an independent archeological consultant for several firms and state organizations. In January 1986, she established her own archeological consulting firm which provides quality archeological research to federal, state and private organizations.

PROJECT CO-DIRECTOR

Robert A. Taylor

M.A. in Anthropology, 1986, University of Arkansas, Fayetteville
(Specialization in Southeastern Prehistory and Cultural Resource Management)

Over 10 years experience in archeology in Arkansas (all over the state with the Arkansas Archeological Survey, MCRA and SPEARS). Also worked in Texas (Texas A & M University Research Foundation), and Oklahoma (Ouachita Mountains, 1987, SPEARS).

Taylor has made several important written contributions to the understanding of prehistory in the state concerning Caddoan sites and the potential for for buried Paleo-Indian sites. He has critically reviewed a predictive model developed for the Ouachita National Forest. Since the summer of 1986, Taylor has worked for SPEARS as a Project Archeologist and Field Director and is a major author on SPEARS reports. His position on the current

project involved directing fieldwork, analyzing artifacts, research and authoring sections of the report.

PROJECT GEOMORPHOLOGIST

Margaret J. Guccione

Ph.D. in Geology, 1982, University of Colorado, Boulder
M.S. in Geology, 1971, Miami University, Oxford, Ohio

Dr. Guccione teaches in the Geology Department at the University of Arkansas. Her dissertation research was on the Quaternary stratigraphy and weathering history of north central Missouri. Other research interests have included studies of the stratigraphy and sedimentology of the loess and fluvial gravels exposed along Crowley's Ridge; research on the braided and meandering streams sediments of the Mississippi River in northeastern Arkansas; research on old buried surfaces in the Arkansas River Valley; and quaternary studies on the Buffalo River and other streams in northwest Arkansas. Dr. Guccione served as a consultant on this project.