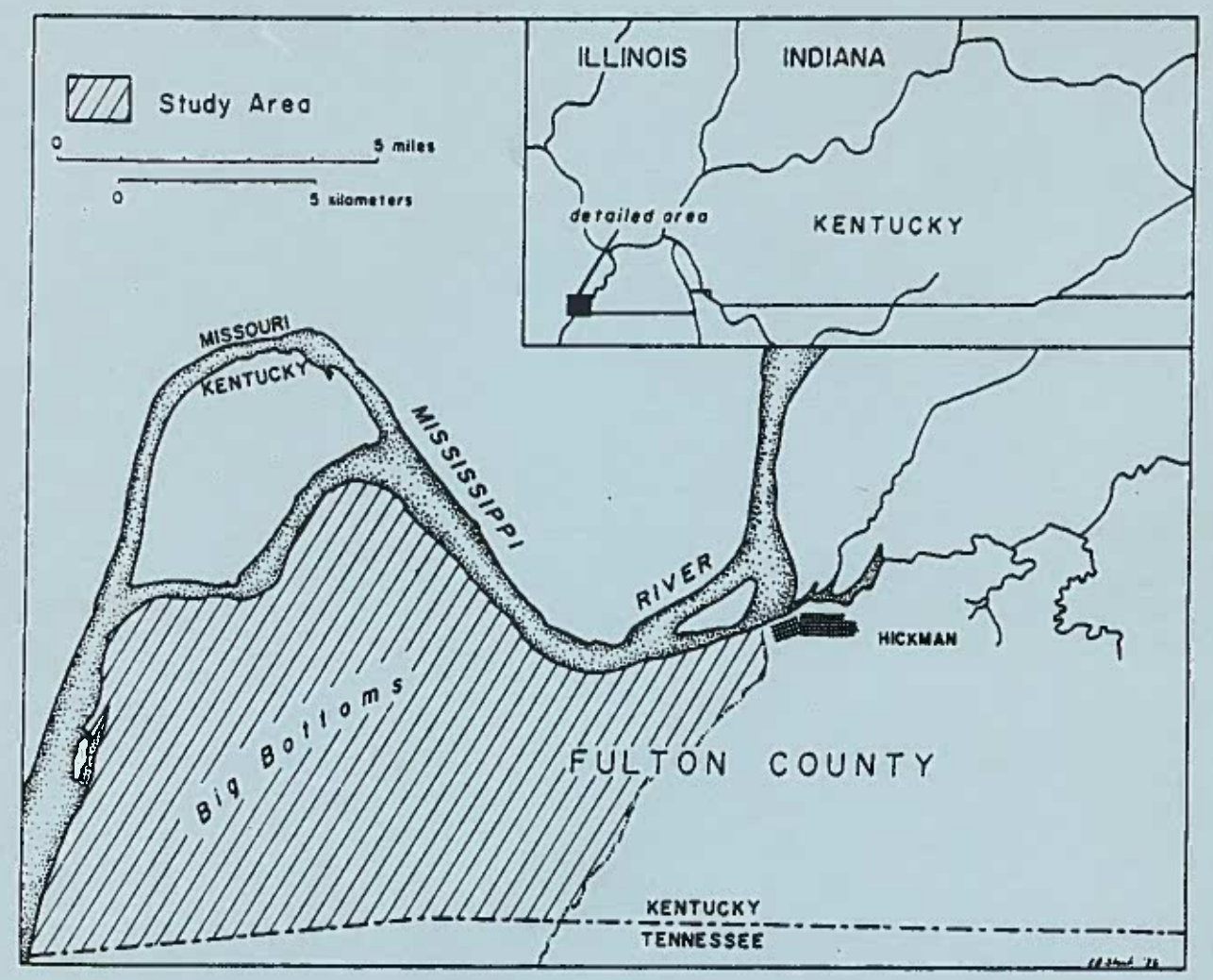
PREHISTORIC SETTLEMENT PATTERNS IN THE BIG BOTTOMS OF FULTON COUNTY, KENTUCKY



by
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KENTUCKY HERITAGE COUNCIL

WESTERN KENTUCKY PROJECT
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Department of Anthropology
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Western Kentucky Project, Report 8

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PREFACE

The University of Illinois at Urbana-Champaign (UIUC) Western Kentucky Research Project began in 1983. At first, our research emphasized the investigation of Mississippian towns, but this scope expanded with each new study. The domain of the "WKY Project" now encompasses the entire archaeological record in the Confluence region, several different, if not conflicting, theoretical perspectives, and a broad range of research questions.

Paul Kreisa developed the project described here to provide an additional data base for his Ph.D. dissertation, which draws heavily from his WKY Project research. He completed the fieldwork during 1986, but then had to set the data aside in order to serve as the field director on another survey and testing project. The latter project is the focus of his recently released report on the nature of late prehistoric "second-order communities" in the Confluence region (WKY Project Report #7). After the completion of the "second-order communities" draft report, Paul drew this monograph together with such ease as to make the task seem effortless. I envy him the illusion.

The monograph provides valuable new data on prehistoric site density and distribution patterns in one of the few major patches of Mississippi Valley bottom that lie in Kentucky. Its focus also anticipates the broad form of several of Kreisa's Ph.D. dissertation chapters. It is a valuable contribution to the archaeological literature of the region and to this series.

The monographs in the Reports series are working documents that describe the results of WKY project investigations. The series was created to communicate basic data from our most recent research projects to other scholars who work in this and adjacent regions. In order to promote the widest dissemination of these monographs, copies of each Report are distributed gratis to other researchers until the initial printing run is exhausted, and at cost thereafter.

R. Barry Lewis
8 February 1989

ACKNOWLEDGMENTS

This project was funded in part by a Summer Research grant from the Department of Anthropology, University of Illinois at Urbana-Champaign. Additional funds for research and graphics preparation were provided by the University of Illinois Graduate College through a Thesis Travel grant and a Dissertation Research grant.

I would like to thank the Big Bottoms landowners, too numerous to mention here, who graciously allowed access to their land and time. Without their cooperation, this project could not have been undertaken. Nor would the summer of 1986 have been as enjoyable had I not had the opportunity to meet the many fine people of Hickman, Kentucky. I also thank the office staff of the Agricultural Soil Conservation Service who assisted in identifying the owners of certain tracts of land.

Especially important to the completion of this project was the hard work of the field crew, all of whom were volunteers. The field crew consisted of Emily Schnabl, Alex Barker, Karl Lorenz, and Lynne Wolforth, who took time away from her own field project to assist the survey several times. These individuals survived a long, hot summer under living conditions which left a lot to be desired.

Thanks also to Dave Minor for his photographic services, and S. Justine Woodard who drew the base maps of the Big Bottoms. And thanks to my colleagues here at the University of Illinois with whom I have engaged in many provocative discussions about settlement patterns and western Kentucky archaeology. Tom Sussenbach's hours of discussion of early Mississippian ceramics also helped immensely. Finally, I would like to thank my advisor, R. Barry Lewis, for his support of this project and his editorial skills during the preparation of this manuscript.

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INTRODUCTION

Western Kentucky, with its numerous Mississippian mound sites, has great potential for investigating processes of development and change in hierarchically organized societies. Past research in the region has tended to focus on Mississippian towns (Figure 1). More recently, a program of probability-based site reconnaissance was initiated, employing an environmentally stratified sampling strategy (Sussenbach and Lewis 1987). This survey yielded data on site density and patterning across major environmental zones in the region between Wickliffe and Hickman, Kentucky.

The research described here builds on the Sussenbach and Lewis (1987) data base. The Big Bottoms project was an intensive survey of a bounded region, and was initiated to add temporally and geographically controlled dimensions to the patterns of settlement identified by Sussenbach and Lewis (1987). An intensive survey in a geographically bounded region can provide, at finer levels of resolution, details of settlement change and information on aspects of social structure not revealed by probabilistic samples. As Butler (1977:21) remarks,

> In terms of site distribution relative to major environmental zones, a sampling design [will].... discover the basic relationships....with less time and effort. It was realized that in the long run, however, important questions....involve the study of small-scale community patterning and local residential units. A sampling survey would not have produced enough information for this kind of analysis.

While surveys that sample environmental zones can identify basic patterns of adaptation, intensive surveys are best able to obtain data on the interactions between sites in prehistoric settlement systems and the development of settlement systems through time. With further analysis, the development of settlement patterns can also be linked to changes in basic economic institutions within societies (Smith 1976).

The Big Bottoms was selected for a number of reasons. First, this area was not included in the survey by Sussenbach and Lewis (1987), which to a great extent, did not concentrate on the Mississippi River floodplain. A Big Bottoms survey can act as an auxiliary data source on general patterning of prehistoric settlement in western Kentucky. Secondly, the Big Bottoms forms a readily defined spatial unit. Third, the many reported mound sites and the previous research in this locality provides a solid basis for the project.

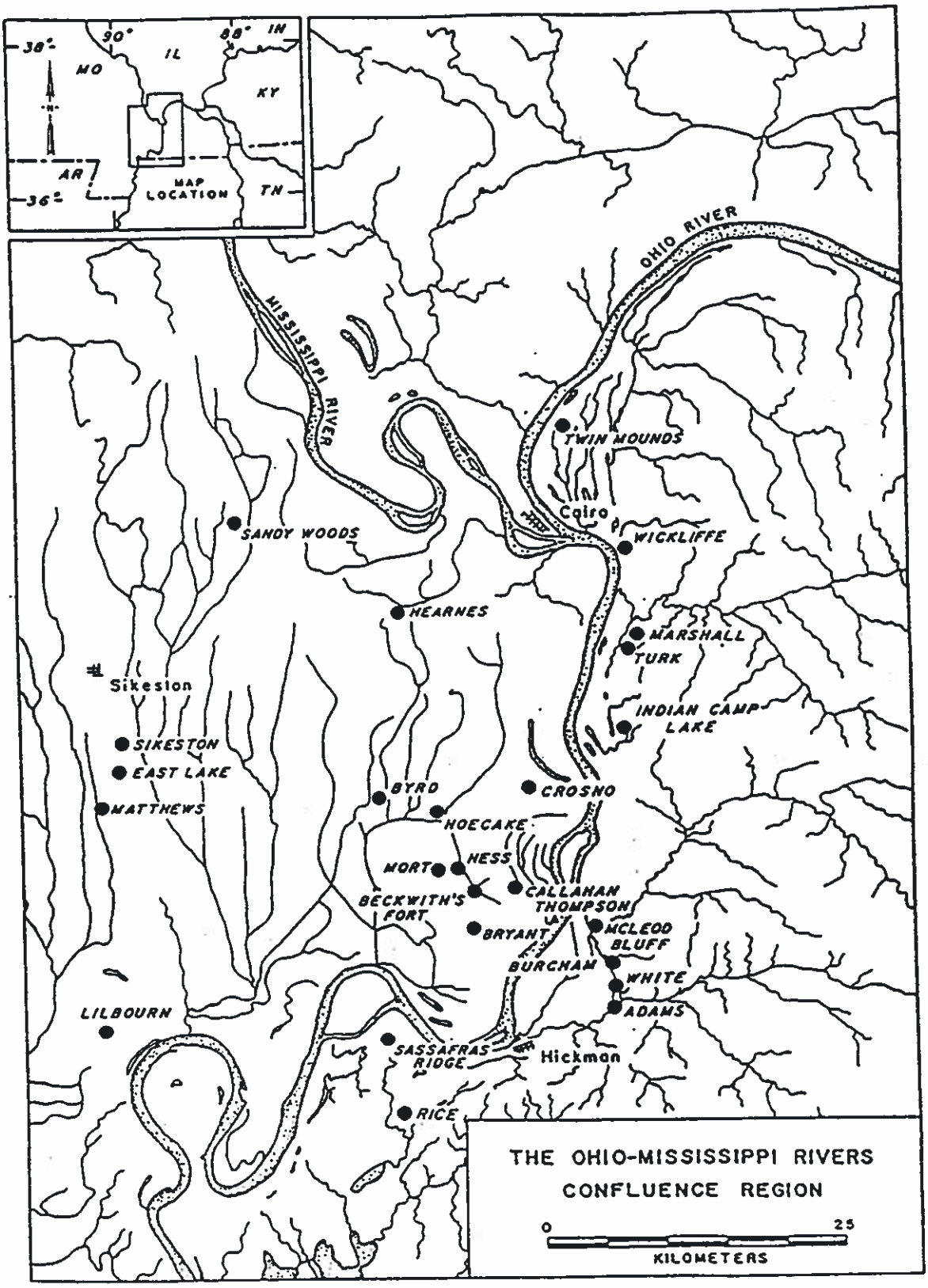

FIGURE 1. Ohio-Mississippi Rivers Confluence Region.

This report presents the results and interpretations of data collected during the 1986 Big Bottoms Survey project. This section describes the floodplain environment, previous research, and the regional chronology. Survey design, methods, and results are presented next. Settlement patterns from the Archaic through the Mississippi periods are then delineated. Since most of the available information is from the Late Woodland and Mississippi periods, the emphasis is placed there. Finally, settlement pattern trends are evaluated in terms of site location, size, and changes in locational relationships of material culture between site types. The report concludes with an evaluation of trends in the data that provide evidence of the development and nature of hierarchical societies in the Big Bottoms.

The Big Bottoms Environment

The Big Bottoms locality comprises the northern portion of the Reelfoot Lake Basin in extreme southwestern Kentucky (Figure 2). This floodplain expanse of the Mississippi River is located south of Hickman in Fulton County. It is bordered on the north and east by bluffs and on the west by the Mississippi River. Most of the Reelfoot Lake Basin lies to the south across the Kentucky-Tennessee state line in northwestern Tennessee. The project area consists of river bottomland across which flows numerous sloughs and small creeks. Descriptions of the environment of the Big Bottoms have been presented elsewhere (Davis 1923; Hazard 1933; Lewis 1974; Loughridge 1888) and are summarized below.

The Big Bottoms is one of the few extensive tracts of Mississippi River floodplain in western Kentucky, although its extent may be somewhat larger at present than in the past (Fisk 1944; Saucier 1974). The topography of the Big Bottoms is dominated by levee remnants and extinct channels, providing its only topographical relief. Based on Lewis (1974), seven biotic communities can be identified on the Bottoms.

A willow and cottonwood edge brush community is found along the banks of the Mississippi River. It is subject to frequent seasonal inundation. Further inland along the natural levees are cottonwood-sycamore forests, often with a thick undergrowth of cane. A sweetgum-elm forest, also with considerable cane undergrowth, is found on the levee remnants of extinct channels or alluvial fans. Both of the latter two communities tend to be infrequently flooded and are located on higher levee ridges. The sweetgum-elm-cypress seasonal swamps and cypress deep swamps are more frequently flooded. The former is subjected to inundation for several weeks or months of the year and the latter may be inundated year-round. A

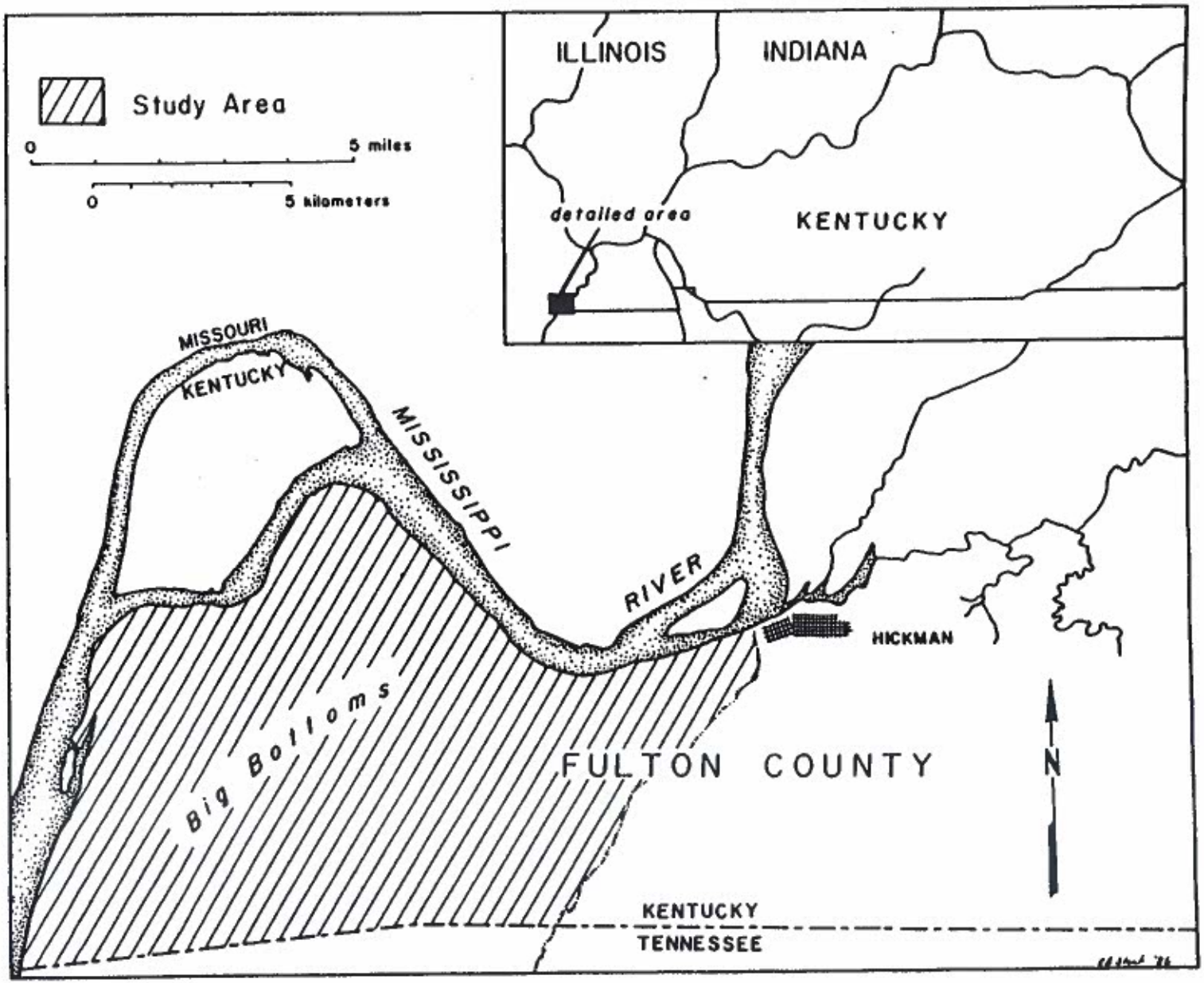

FIGURE 2. The Big Bottoms Study Region.

water millet-lily marsh environment is found in the floodplain sloughs and ponds. The final biotic community is associated with the secondary growth on fields, and presumably became common only after the Late Woodland period. Although these communities are smaller due to the advance of modern farming, each still occurs in the Bottoms.

The Big Bottoms soils reflect past channel movements and seasonal flooding cycles. Three soil associations, Commerce-Robinsonville, Sharkey-Tunica, and Patton-Wakeland-Birds-Calloway are present (Newton and Sims 1961). Commerce-Robinsonville soils formed from Mississippi River alluvium and range from well to poorly drained natural levee soils. Sharkey-Tunica soils consist of fine-textured poorly drained alluvium that formed in areas of slack water along the Mississippi River. This group of soils tends to have poorer agricultural potential when compared with the Commerce-Robinsonville association. Patton-Wakeland-Birds-Calloway soils are present along the northeast bluff base on the Bottoms. Apparently, this soil association is present due to the erosion of the bluffs. It has poor drainage and relatively low agricultural potential, although there is a degree of variability within specific soil types.

North and east of the Big Bottoms are the bluffs, which rise as much as 70 m above the floodplain, and form the boundary of the Mississippi River Valley. Along the crest of the bluffs is a beech-tulip forest with a cane undergrowth, which gives way to an oak-hickory forest in the dissected uplands to the east.

The Fulton County climate allows for a growing season of almost 200 days in the Bottoms and slightly less in the uplands. Annual rainfall is over 1.2 m, with the highest amounts occurring from December to May, and summer rains in the form of intense and somewhat unpredictable thunderstorms (Newton and Sims 1961). Flooding of the Mississippi River tends to occur from February to June, although severity and timing is variable.

Previous Archaeological Research

Archaeological investigations have been conducted on the Big Bottoms for over 100 years. Most research has centered upon the investigation of mound sites. More recently, smaller moundless sites have increasingly become the focus of research.

The first detailed description of a Big Bottoms site was by Loughridge (1888), who investigated Sassafras Ridge (15Fu3). Loughridge (1888) published a detailed sketch map of the site,

in which he noted the existence of three mounds, and provided dimensions for the main mound as being 36.6 m (120 feet) in length and 6.1 m (20 feet) high. A few decades later, Moore (1916) visited Sassafras Ridge and conducted excavations that may have been located on the two smallest mounds. No material was found in the first "rise" excavated by Moore, but two burials were excavated in the second "rise." The first, a cremation burial, was inhumed in a vessel mixed with fragments of sheet copper. The second was also a secondary interment buried with a shell-effigy vessel.

Funkhouser and Webb's (1932) statewide archaeological survey initiated the next period of archaeological activity on the Big Bottoms. They described the Sassafras Ridge site but make no mention of the smaller mounds. They also report three other Big Bottoms sites: 15Fu8, a mound site located 4 km (2.5 miles) southwest of Hickman, 15Fu10 a "campsite" located 5.6 km (3.5 miles) southwest of Hickman, and 15Fu12 a mound site located 14.5 km (9 miles) southwest of Hickman. These three sites have not been relocated.

Archaeological interest in the Big Bottoms did not resume until the advent of the Great River Road project in 1960. Schwartz and Sloan (1960) recorded sites 15Fu16-18 during a survey of the Bottoms for that project. It was noted that 15Fu16 and 15Fu17 both had possible mounds, while 15Fu18 had three mounds. Later, also for the Great River Road project, Smith (1979) located three additional sites, 15Fu21-23. Mississippian components were noted at 15Fu21 and 15Fu22, and a Late Woodland-early Mississippi period component was identified at 15Fu23.

Research activity increased toward the end of the 1970s, mostly due to a general increase in contract archaeology in the United States. Schock and Langford (1978) recorded numerous small Late Woodland and Mississippi period sites during a survey of a 2.4 km (1.5 mile) corridor for a channelization project just north of the modern town of Sassafras Ridge. McNerney and Nixon located numerous historic and one prehistoric site along the levee (1980), and McGraw (1981) made collections at numerous previously recorded sites on the Bottoms during a survey for the Great River Road project. Klinger et al. (1983) recorded two Mississippi and one Woodland period site during a survey of areas associated with Reelfoot Lake No. 9. Carstens et al. (1981) attempted, with some degree of success, the use of aerial photography to identify archaeological sites near Sassafras Ridge.

Beginning in 1983, the University of Illinois at Urbana-Champaign Western Kentucky Project (UIUC-WKY) began investigations on the Big Bottoms. Personnel from the UIUC-WKY Project conducted a controlled surface collection of a

portion of the Sassafras Ridge site and produced a detailed topographic map of the mound and village area (Stout 1986). Mound dimensions published by Loughridge (1888) and Moore (1916) were found to be essentially correct, and a radiocarbon sample from the top of Mound A was dated to A.D. 1290-1380±80. At about the same time in Tennessee, the Tennessee Department of Conservation began conducting site surveys and excavations at numerous Woodland and Mississippi period sites in the Reelfoot Lake locality (Mainfort et al. 1986).

The most recent archaeological research on the Bottoms took place during 1986 when Wolforth conducted test excavations at Running Slough (15Fu67). The major components at this site were Dorena and Medley phase occupations during the Mississippi period (Wolforth 1988). The Second-Order Communities project (Kreisa 1988) also obtained surface collections at numerous village sites, and conducted test excavations at Rice (15Fu18) in late 1986.

Regional Prehistoric Chronology

The prehistory of the Jackson Purchase region has been discussed by Clay (1981). Sussenbach and Lewis (1987) and Lewis (1987) have outlined the Late Woodland and Mississippi periods, respectively. Characteristics of the Archaic and Early and Middle Woodland periods are known from other regions. Figure 3 presents the regional chronology used in this report. Phases within this chronological sequence are treated as units of time with fixed, arbitrary boundaries (Lewis 1987). In this respect, phases are not defined on the basis of material culture, although each phase is associated with a particular assemblage. The material culture associated with each phase is described in detail in later sections of this report.

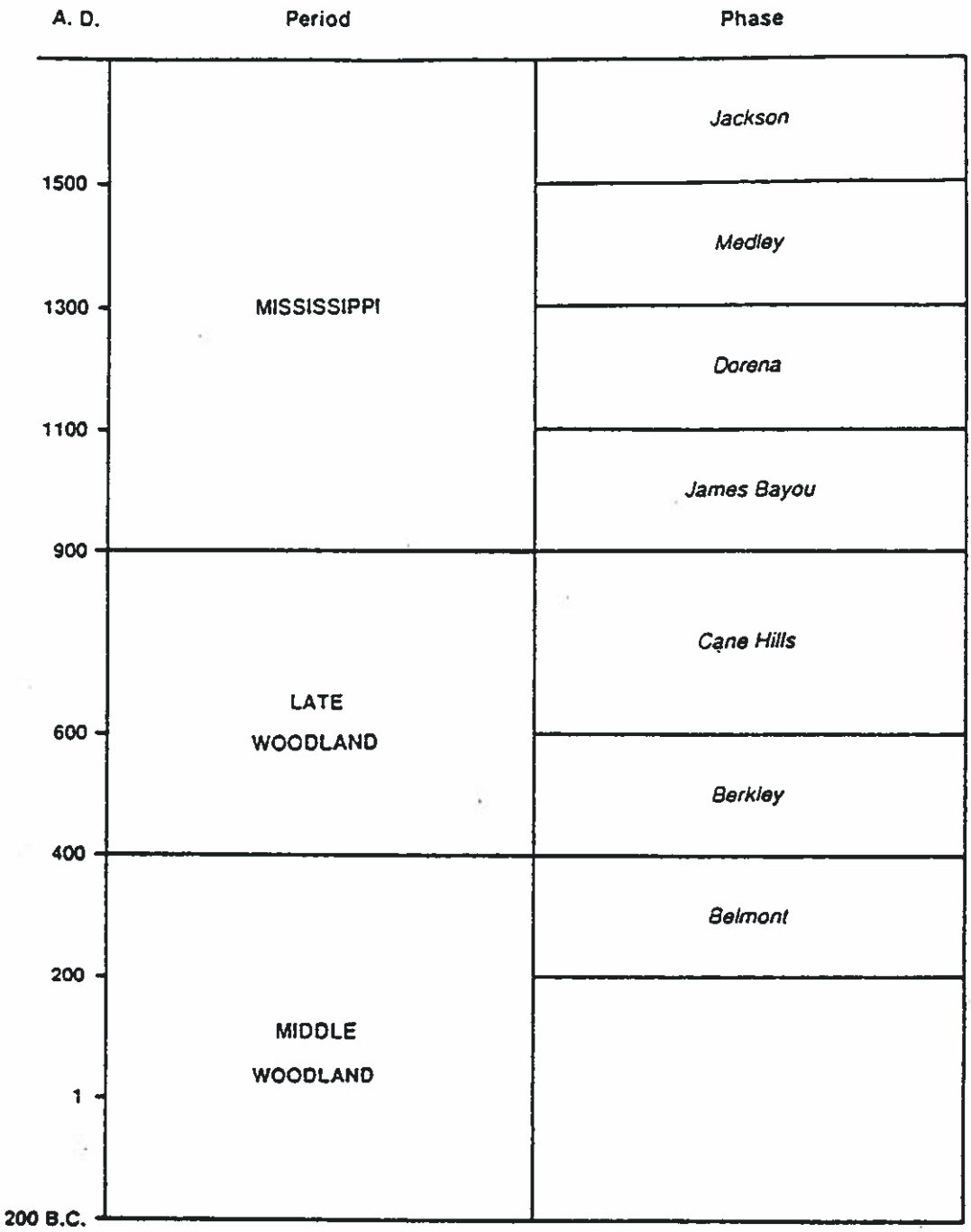

FIGURE 3. Regional Chronological Sequence.

SURVEY OF THE BIG BOTTOMS

The Big Bottoms Survey project was designed to collect data on temporal trends in prehistoric settlement on the Big Bottoms. To accomplish this goal, as much of the area was surveyed as possible, given time and other constraints.

Landowners were contacted for permission to survey land that had not been previously investigated by other researchers. In a few instances, recorded sites were resurveyed. An estimated 865 ha were surveyed by the project (Figure 4).

Reconnaissance techniques consisted of transects surveyed at intervals of 5-15 m, depending on field size, ground visibility, and the elevation above sea level of the area. Most surveyed areas were agricultural fields planted with row crops, or fallow fields. Fields that had been recently plowed were not surveyed due to their generally poor visibility. Surface visibility in all fields was good to excellent, and this minimized the need for shovel testing. When an artifact scatter was encountered, the area was intensively surveyed in 3-5 m intervals. The smaller intervals permitted the collection of representative artifact samples and the definition of site boundaries.

Data collected in the field consisted of ground visibility estimates, location of the site on topographic maps, artifacts, and a detailed sketch map of each site area. Dimensions of the artifact scatters were estimated by pacing. Complete artifact collections were made at previously unrecorded sites, while samples were collected from registered sites.

All artifacts were processed and analyzed at the University of Illinois at Urbana-Champaign. Kentucky Archaeological Site Survey forms were completed for all previously unrecorded sites and update forms for previously registered sites. The criteria used for site definition required artifact scatters to be separated by at least 50 m of intervening area without material to be considered a distinct site. Locales with a few widely separated artifacts were considered isolated finds.

The Big Bottoms project surveyed over 865 ha and identified 26 new sites. Additionally, in conjunction with the Second-Order Communities project (Kreisa 1988), six previously reported sites were revisited. This yields an approximate prehistoric site density of three sites per square km. To generalize across the Big Bottoms, between 140-160 prehistoric sites should be located in the study region. After the Big Bottoms survey, about half of these sites have been located.

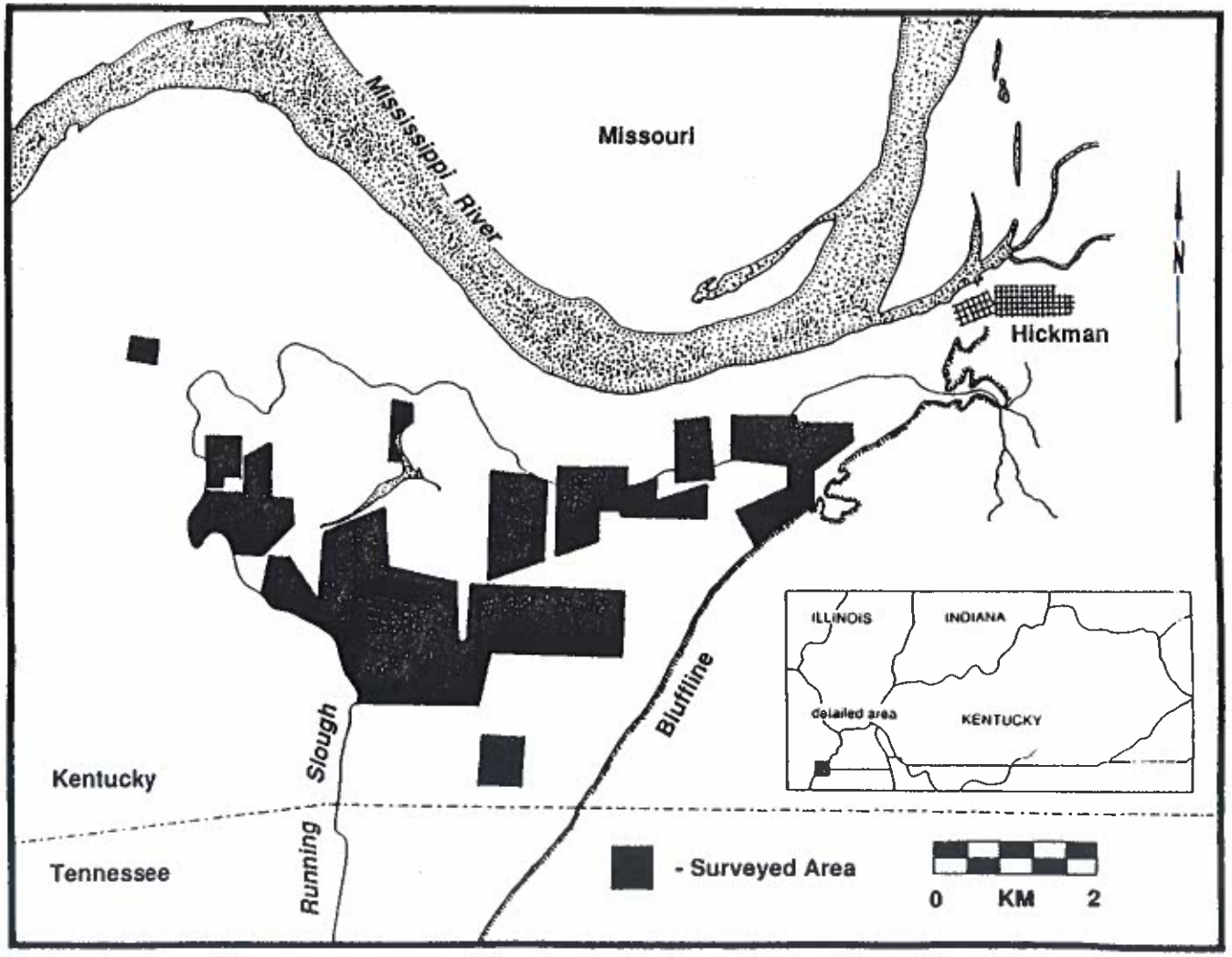

FIGURE 4. Location of Survey Areas.

Most sites were found on extinct natural levees. Bluff base locations were the second-most common area for sites. All sites were located on elevations between 96 m and 102 m asl; most (22) occur at elevations of 96 m to 98 m asl. The four most common soil types on which sites are located are Dubbs silt loam, Robinsonville silt loam, Beulah fine sandy loam, and Commerce silt loam. All are alluvially deposited and associated with levee formation, and all are well drained and high in agricultural potential. The other soil types on which sites are located tend to be less well drained and less suited to agriculture. Generally, only one or two sites are located on these soil types.

Most sites located by the survey can be termed farmsteads. Over 69% of the sites have an area less than 1/2 ha. A few sites, termed hamlets, have a total site area of 1/2 to 2 ha. Only one site, 15Ful15, is larger than 2 ha in extent, and can be classified as a small village.

Most sites are multi-component. Component identifications were based on lithic and ceramic cross-dating. The recorded sites date from the Archaic to Mississippi periods (Table 1). Most occupations appear to be Cane Hills to James Bayou phase (ca. A.D. 600-1100) components. Relatively few Dorena (A.D. 1100-1300) or Medley (A.D. 1300-1500) phase components were identified at the newly recorded sites, although numerous previously recorded sites on the Big Bottoms have components dating to those phases. Similarly, few Belmont (A.D. 200-400) or Berkely (A.D. 400-600) phase components were identified at the newly recorded sites.

Cultural Remains

Ceramics and other fired clay objects, lithics, and faunal remains were collected at 28 Big Bottoms sites. These artifacts provide information for cross-dating the sites, and along with location and site size, provide the basis for site use inferences. This section describes each artifact category. The remains from each site are summarized in Tables 2 and 3.

Ceramics

Prehistoric ceramics were found at all but one site. Sherds were sorted into types and varieties based on Marshall (1965), Phillips (1970), Phillips et al. (1951), and Sussenbach and Lewis (1987). Rim analysis included the determination, when possible, of vessel form, rim shape, lip shape, decoration, and rim diameter. Sherds smaller than 6 mm in diameter were not analyzed.

TABLE 1. Selected Attributes of Big Bottoms Sites.

Site	Size (ha)	Elevation (m asl)	Components*	Soil Type
Fu92	.20	98	MW, LW	Sharkey
Fu93	.05	98	LW, EM	Commerce
Fu94	.12	98	MW	Commerce
Fu95	.09	98	LW, EM	Robinsonville
Fu96	.36	96	LW, EM, LM	Dubbs
Fu97	.10	96	LW	Sharkey
Fu98	.04	96	LW	Dubbs
Fu99	.04	96	Woodland	Dubbs
Fu100	.45	98	LW	Beulah
Fu101	.75	98	MW, LW, EM	Robinsonville
Fu102	.19	96	LW	Dubbs
Fu103	1.50	96	LW, EM	Dubbs
Fu104	.38	98	LW, EM	Beulah
Fu105	.60	98	LW, EM, LM	Beulah
Fu106	.01	96	LW, EM	Dubbs
Fu107	.23	102	LW, EM	Waverly
Fu108	.46	96	LW, EM	Forestdale, Dundee
Fu109	.71	96	MW, LW, EM	Dundee, Dubbs
Fu110	.03	96	LW, EM	Robinsonville
Fu111	.51	98	LW, EM	Robinsonville
Fu112	.33	96	LW, EM	Commerce
Fu113	.94	96	LW, EM	Robinsonville
Fu114	.02	102	LW, EM	Waverly
Fu115	2.02	96	LW, EM	Beulah
Fu117	.80	100	Archaic	Forestdale, Dundee
Fu118	.16	98	Woodland	Sharkey

* MW = Middle Woodland, LW = Late Woodland, EM = early Mississippi period, LM = late Mississippi period

TABLE 2. Artifacts from Sites 15Fu15 through 15Fu104.

Artifact Class	Fu 15	Fu 92	Fu 93	Fu 94	Fu 95	Fu 96	Fu 97	Fu 98	Fu 99	Fu 100	Fu 101	Fu 102	Fu 103	Fu 104
Ceramics														
Mississippi Plain	0	0	0	0	0	3	0	0	0	0	0	0	3	0
Bell Plain	0	0	0	0	1	3	0	0	0	0	0	0	0	0
Old Town Red	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Baytown Plain,														
var. unspecified	29	7	8	7	2	0	9	0	2	0	8	2	14	9
var. Mayfield	0	0	15	0	8	27	7	4	0	2	17	1	24	0
Mulberry Creek Cm.,														
var. unspecified	36	6	3	14	0	2	0	0	0	0	9	2	4	3
var. Sandy Branch	0	0	19	0	0	5	1	1	0	2	5	0	6	3
Kinnswick Fabric Imp.,														
var. Marshall	0	0	0	0	0	1	0	0	0	0	0	0	1	0
Unclassified	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Too Small	10	8	11	2	2	2	5	0	0	1	9	0	3	6
Other Fired Clay Objects														
Daub	0	14	0	0	0	1	0	3	7	0	1	0	0	3
Baked Clay Objects	0	0	0	0	0	0	1	1	0	0	0	0	0	0
Chipped Stone Tools														
Scrapers	2	0	0	0	0	1	0	0	0	2	0	0	0	0
Bifaces	1	0	0	0	0	0	0	0	0	0	2	0	0	0
Knife	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Projectile Points	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Hoes/Flakes	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Multi-Use	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Modified Cobbles														
Hammerstone	0	0	0	0	0	0	0	0	1	0	1	0	0	0
Unknown	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Other Stone Tools														
Cobbles	1	2	1	0	0	1	0	0	0	0	0	0	0	0
Blades	1	0	0	0	0	0	0	0	0	1	0	0	0	1
Cores	1	0	0	1	0	0	1	0	0	0	0	0	2	0
Flakes	18	4	7	2	7	11	4	1	0	26	24	8	20	10
Fire-Cracked Rock	0	1	2	0	0	0	0	1	0	0	1	2	1	0
Faunal Remains	0	1	0	0	0	0	0	0	0	0	0	0	0	0

TABLE 3. Artifacts from Sites 15Fu105 through 15Fu305b.

Artifact Class	Fu 105	Fu 106	Fu 107	Fu 108	Fu 109	Fu 110	Fu 111	Fu 112	Fu 113	Fu 114	Fu 115	Fu 117	Fu 118	Fu 305a	Fu 305b
Ceramics															
Mississippi Plain	3	0	0	0	0	0	1	0	0	0	2	0	0	0	0
Bell Plain	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0
O'Byam Incised	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Baytown Plain,															
var. unspecified	1	1	4	1	2	0	8	0	24	0	2	0	1	2	1
var. Mayfield	9	3	2	8	8	5	22	7	31	1	15	0	0	7	0
Mulberry Creek Cm.,															
var. unspecified	0	0	1	1	0	0	20	0	12	1	1	0	0	1	2
var. Sandy Branch	3	0	1	4	0	0	18	9	11	0	1	0	0	2	0
Kinnswick Fabric Imp.,															
var. Marshall	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Withers Fabric Imp.	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Too Small	7	1	1	9	6	3	14	10	11	0	5	0	0	7	2
Other Fired Clay Objects															
Daub	0	0	3	1	0	0	0	0	0	0	1	0	0	0	2
Chipped Stone Tools															
Scrapers	0	0	4	2	0	0	1	0	0	0	1	3	0	0	0
Bifaces	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0
Drills	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Projectile Points	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Hoes/Flakes	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
Multi-Use	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Modified Cobbles															
Celt	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Mano	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Metate	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Hammerstone	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0
Multi-Use	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Other Stone Tools															
Cobbles	0	0	2	0	0	0	4	0	1	0	1	5	0	0	0
Blades	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Cores	0	1	2	0	0	0	0	0	1	1	2	3	0	0	0
Flakes	6	6	131	15	10	1	20	2	25	4	26	30	1	0	3
Fire-Cracked Rock	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0
Faunal Remains	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Mississippi Plain

This coarse, shell tempered plainware comprises 2% of the ceramic assemblage. One jar rim was found at 15Fu96. It has an incurvate profile, an estimated diameter of 22-26 cm, and a flat lip.

Bell Plain

Fine tempered plainwares with smoothed or burnished exterior surfaces account for 1% of the collected ceramics. Temper consists of either finely crushed shell, grog, or a combination of both. Two bowl rims were collected, of which each has an everted rim shape. One specimen has a round lip, and one has a flat lip. A tab is present on one example.

O'Byam Incised, var. O'Byam

One bowl rim from 15Fu105 has an incised line-filled triangle on its interior surface. The rim has an everted profile, a pointed lip, and exterior notches placed on the lip.

Old Town Red

Shell-tempered ceramics with red-slipped surfaces comprise less than 1% of the assemblage. The sample consists entirely of bodysherds.

Baytown Plain, var. unspecified

Sherds assigned to this category of plainwares have two distinct pastes. The first is a sandy paste with few to no observable tempering particles. The temper particles that do occur are large pieces of grog. The paste is not convoluted like the typical Baytown Plain paste. Sandy paste sherds were found at three sites, 15Fu15, 15Fu92, and 15Fu94. Two rims, one each from 15Fu92 and 15Fu94, were collected. Both are too small to provide vessel forms. One has a pointed lip and the other a round lip.

The other category is a grog-tempered convoluted paste. Two rims were found. One rim collected at 15Fu107 is from an inslanted bowl with an orifice diameter estimate of 26-30 cm and a flat lip. No vessel form can be determined for the other rim from 15Fu93. It has a rounded lip.

Baytown Plain, var. Mayfield

This grog-tempered, fine paste plainware is the most numerous ceramic type collected, comprising 30% of the assemblage. Everted rim bowls are the most common vessels. Lips consist of one example each of flat, pointed, and

inslanted shapes. Jars (2) have incurvate (1) and inslanted (1) rim profiles, with one pointed and one inslanted lip. One pan rimsherd, has an highly everted profile and an outslanted lip. Vessel forms for three rims could not be determined. These rims have round (1), pointed (1), and inslanted (1) lips. One specimen, possibly a rim fold, has exterior notches; another has possible interior notches.

Mulberry Creek Cordmarked, var. unspecified

As with Baytown Plain, var. unspecified, there are two distinct pastes subsumed under this type, a sandy paste and a chalky, convoluted paste. The characteristics of the sandy paste are similar to that described for the Baytown Plain sandy paste sherds. Cordmarked sandy paste specimens were found at 15Fu15, 15Fu92, and 15Fu94, and include three rimsherds, one from each of these sites. None of the three were large enough to determine vessel form. Two have flat lips and one has a pointed lip. One of these sherds is a possible folded rim fragment.

Cordmarked rims with a chalky, convoluted, grog-tempered paste were recovered at 15Fu111 and 15Fu113. One is from a bowl and has a pointed lip. No vessel form could be determined for the other, although it appears to be a folded rim. It has interior notches placed perpendicular to the lip.

Mulberry Creek Cordmarked, var. Sandy Branch

Cordmarked sherds with a grog-tempering and a fine paste account for 12% of the ceramic assemblage. One incurvate jar rim, collected at 15Fu95, has a pointed lip. An everted bowl rimsherd with a flat lip was found at 15Fu108. Four rims were too small to determine vessel form. These rims have pointed (3) and inslanted (1) lip shapes. Three are possible rim folds, one of which has exterior notches and another is cordmarked.

Kimmswick Fabric Impressed, var. Marshall

Fabric-impressed, grog-tempered bodysherds from pan-like vessels constitute 1% of the assemblage. The one rim found has an highly everted profile and a rounded lip.

Withers Fabric Marked

One bodysherd of this fabric marked, grog-tempered type was found.

Unclassified Sherds

One bodysherd is possibly an example of Yates Net Impressed. It has a Baytown-like paste and a net impressed exterior.

Almost all of the sherds smaller than 6 mm in diameter are grog-tempered, and probably represent either Baytown Plain or Mulberry Creek Cordmarked types. This group constitutes 18% of the ceramic assemblage.

Fired Clay Artifacts

Daub

Irregularly shaped, fired clay fragments were collected at 10 sites. It is assumed that this material represents the remains of clay wall plaster.

Baked Clay Objects

Two fragmented hemispherical objects were found. Comparable objects have been reported from western Kentucky (Sussenbach and Lewis 1987) and southeast Missouri (Lewis 1982). These items may date anywhere from the Late Archaic through the Mississippi period.

Chipped Stone Artifacts

Chipped stone tools, modified cobbles, and other stone artifacts are described based on morphology, raw material source, evidence of reuse, and heat alteration. Chert sources are based on Stelle (1986) and Sussenbach and Lewis (1987). Heat alteration was recognized by color and textural changes. The distribution of lithics is presented in Tables 2 and 3.

Scrapers

This category includes side scrapers (8) and spokeshaves (5). Side scrapers have steep working edges along a lateral margin, while spokeshaves have a steep edge angle within a concave notch. Side scrapers were made from Purchase Gravel (3), Burlington (1), Mill Creek (1), and unknown (5) cherts. One side scraper of an unknown chert was heat treated. Spokeshaves were made from recycled Mill Creek hoe flakes (2), and from Burlington (1), heat treated Purchase Gravel (1), novaculite (1), and heat treated Dongola/Cobden (1) chert. One other specimen, which is of Purchase Gravel, is both a side scraper and a spokeshave.

Bifaces (Figure 5, a)

Specimens with continuous bifacial chipping on all lateral edges are included in this category. Purchase Gravel (3) and Mill Creek (2) specimens are most numerous, while Burlington (1) and two examples made from unknown cherts are also present.

Drills (Figure 5, b)

Two drills were collected, both of which were made from unknown cherts. One drill appears to have been heat treated. One specimen is triangular in cross-section and is made from a flake. The other is lenticular in cross-section and is a hafted drill base fragment.

Knife

One knife tip, made from an unknown chert, was collected.

Projectile Points (Figure 5, c)

Three projectile points were found. Two are triangular points made from Burlington (1) and an unknown (1) chert. The other specimen has deep side notches and is similar to Motley points (Justice 1987). It is made from an unknown chert type.

Hoe and Hoe Flakes (Figure 5, d)

This category was identified by the presence of polish on the exterior surfaces of the artifact. One nearly complete Mill Creek chert hoe was found. It is 119 mm long, 43 mm wide, and 14 mm thick. Two hoe flakes, both of Mill Creek chert, were also collected. One is heat treated.

Multi-Use Chipped Stone Tools (Figure 5, e)

Two tools combine more than one morphological category. One Purchase Gravel specimen is both a spokeshave and a side scraper. The other example combines a spokeshave and a knife, and is made on a heat treated, Mill Creek chert hoe fragment.

Modified Cobbles

Celt (Figure 6, a)

One greenstone celt was collected at 15Fu115. It measures 141 mm long, 61 mm wide at the hafting portion, and 72 mm wide at the bit end. The bit end surface is smoothed, while the butt end is either pecked or battered.

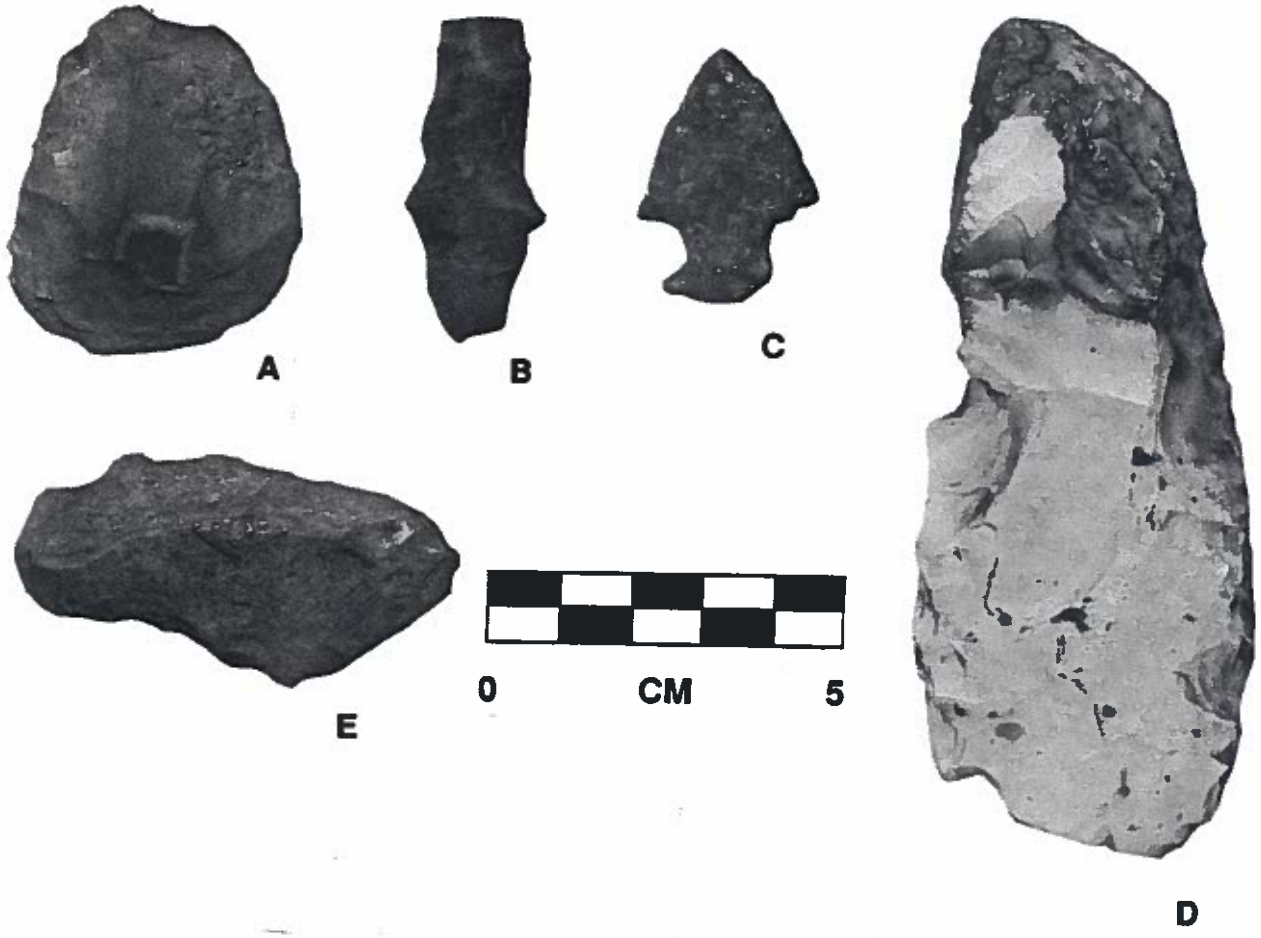

FIGURE 5. Chipped Stone Artifacts: a, biface; b, drill base; c, projectile point; d, hoe; e, multiple use chipped stone artifact.

FIGURE 6. Modified Cobbles: a, celt; b, multiple use modified cobble.

Mano

One hand-held grinding stone, made of quartzite, was recovered.

Metate

Two sandstone specimens have concave depressions, suggesting their use as grinding slabs.

Hammerstones

Four cobbles with pecked and battered margins were collected. Igneous/metamorphic rock (2) is most common, although Purchase Gravel (1) and quartzite (1) examples are also present.

Unidentified Groundstone Tools

Four broken specimens with well ground surfaces were found. Three are sandstone and the other is igneous or metamorphic rock.

Multi-Use Groundstone Tool (Figure 6, b)

One quartzite groundstone tool shows pitted anvil and hammerstone use-wear.

Other Stone Artifacts

Cobbles

Cobbles have no evidence of purposeful human alteration. Sandstone (11) is most common, although hematite (6) cobbles were also found. One example is of an unknown lithic material.

Blades

Blades (4) have a length that is at least twice as great as width (Crabtree 1972). Glacial gravel (1), quartzite (1), and two specimens of unknown lithic material were collected.

Cores

Cores (15) are cobbles that have flake scars. Purchase Gravel (9) is most common, followed by Mill Creek (2), Dongola/Cobden (1), Dover (1), quartzite (1), and an unknown chert (1). One of the Purchase Gravel specimens is heat treated.

Flakes

A total of 422 flakes were collected, including primary, secondary, and tertiary flakes, and angular fragments. Primary flakes were distinguished by a prominent bulb of force and a large amount of cortex present on the exterior surface, secondary flakes by a smaller bulb of force and little to no cortex, and tertiary flakes by a small to absent bulb of force, no cortex, and a small size. Angular fragments are blocky, irregular chunks produced during core reduction or by various cultural and natural processes.

Primary flakes account for 19% of the debitage, secondary flakes for 28%, tertiary flakes for 11%, and angular fragments for 42% of the debitage. Unknown cherts (141) are most numerous, followed by Purchase Gravel (125), Dongola/Cobden (58), Burlington (34), Mill Creek and glacial gravel (14 each), Dover (8), quartzite (6), novaculite (2), and St. Louis chert, slate, cannel coal, and sandstone (1 each). Burlington cherts were most frequently heat treated (50%), followed by Purchase Gravel (17%), unknown cherts (16%), and Dongola/Cobden (less than 1%).

Fire-Cracked Rock

Most fire-cracked rocks are of igneous/metamorphic material (10). Two Purchase Gravel nodules were also collected.

Faunal Remains

A gar scale (*Lepisosteus* sp.) and a mussel shell fragment were found.

SETTLEMENT PATTERNS

This section describes prehistoric Big Bottoms settlement patterns. Descriptions of diagnostic artifacts for each time period are also presented. In order to place this data within a regional context, settlement patterns and material culture traits from adjacent areas are also discussed.

The discussion begins with an examination of Archaic and Early Woodland occupations, since no PaleoIndian material has yet been reported from this locality. It follows with the Middle Woodland, Late Woodland, and Mississippi periods. The Mississippi period discussion is subdivided into the James Bayou-Dorena phases (A.D. 900-1300), and the Medley phase (A.D. 1300-1500). This is not to suggest that the grouping of these phases has a cultural reality or significance. Rather, it underlies the difficulty in assigning individual sites to a specific phase based on surface collected material alone.

Archaic and Early Woodland (7000 B.C.-200 B.C.)

Surface collections at four sites yielded stemmed projectile points that date to the Late Archaic and Early Woodland periods (Justice 1987). All four sites within the Bottoms are widely separated (Figure 7). One specimen similar to Saratoga Stemmed (Justice 1987:157) and was found at 15Fu117 by the landowner. The associated assemblage at 15Fu117 consists of numerous scrapers, bifaces and flakes, the majority of which are made of Purchase Gravel. According to the landowner, a few potsherds have been collected at 15Fu117. The projectile points from the other sites consist of unclassifiable stemmed bases.

The size range of Archaic-Early Woodland sites on the Bottoms is difficult to estimate. Occupations at 15Fu15, 15Fu16, and 15Fu107 date mainly to the Middle Woodland period and later. Only 15Fu117 has a predominantly non-ceramic component. Its estimated size is 7 ha. All four sites lie on extinct river levees at elevations between 98-100 m asl.

Outside of the Big Bottoms, Archaic period sites are located predominantly on the bluffcrest, in the dissected uplands, and on stream terraces (Sussenbach and Lewis 1987). Sites range from 1 ha to over 3 ha in size. This indicates that Archaic populations used a number of physiographic zones in western Kentucky. The paucity of sites on the Mississippi River floodplain may be due to a number of factors. Geomorphological factors such as alluviation or channel movement may have buried or destroyed Archaic sites. As well,

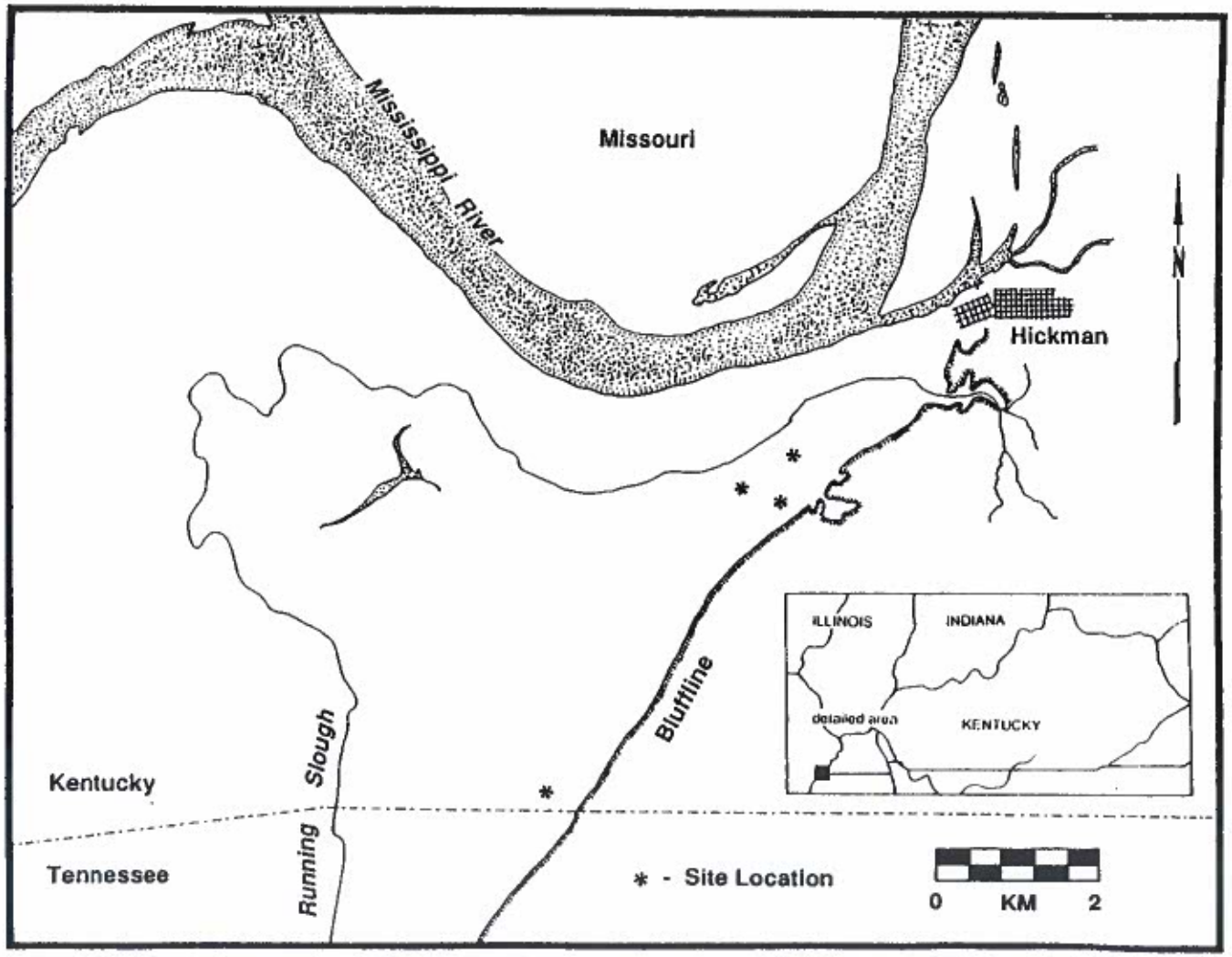

FIGURE 7. Archaic-Early Woodland Site Distribution.

cultural factors may have promoted use of resources outside of the floodplains at this time period.

Middle Woodland (200 B.C.-A.D. 400)

The key characteristic used to assign sites to the Middle Woodland period in western Kentucky was the presence of fabric marked ceramics. In the Big Bottoms, most fabric marked ceramics are classified as Withers Fabric Impressed. Additionally, sandy paste, sand tempered cordmarked and plain ceramics may date to the Middle Woodland period. Although the exact dating of the sandy paste ceramics is unknown, many researchers have considered these sherds to be a Middle Woodland variant (Mainfort 1986; Mainfort and Carstens 1987; Smith 1979). Sandy paste sherds have been recovered from the O'Byam's Fort (15Fu37), located just north of Hickman. On the other hand, these sandy paste sherds could reflect the use of naturally sandy clays for pottery manufacture.

Seven sites in the Big Bottoms have Middle Woodland components (Figure 8). Six of these sites are clustered around the Amberg Mounds (15Fu15). The Amberg Mounds consist of two conical mounds surrounded by a fairly light scatter of domestic debris. To the west is 15Fu109, at which a fabric marked sherd was collected.

The site types present on the Bottoms consist of the Amberg Mound complex, with a total site area of 5 ha, and several sites smaller than 1 ha. All are situated on extinct natural river levees, except for one site that borders a poorly drained swampy area. Site elevations range from 96-100 m asl.

Few floodplain Middle Woodland sites have been found in western Kentucky. Most are reported from bluffcrests, dissected uplands, and stream terraces. The sizes of these sites range from less than 1 ha to greater than 3 ha. Site types include open habitation sites, numerous single mound sites located on the bluffcrest, which have little or no indication of habitation areas, and sites with both mounds and habitation areas. O'Byam's Fort (15Fu37), located just north of Hickman, consists of a rather complex geometric earthwork (Mainfort and Carstens 1987).

Late Woodland (A.D. 400-900)

Two Late Woodland phases have been defined in western Kentucky (Kreisa and Stout 1989; Sussenbach and Lewis 1987); Berkley (A.D. 400-600) and Cane Hills (A.D. 600-900). The assemblages of both phases are dominated by Baytown Plain and Mulberry Creek Cordmarked ceramics, although by late in the

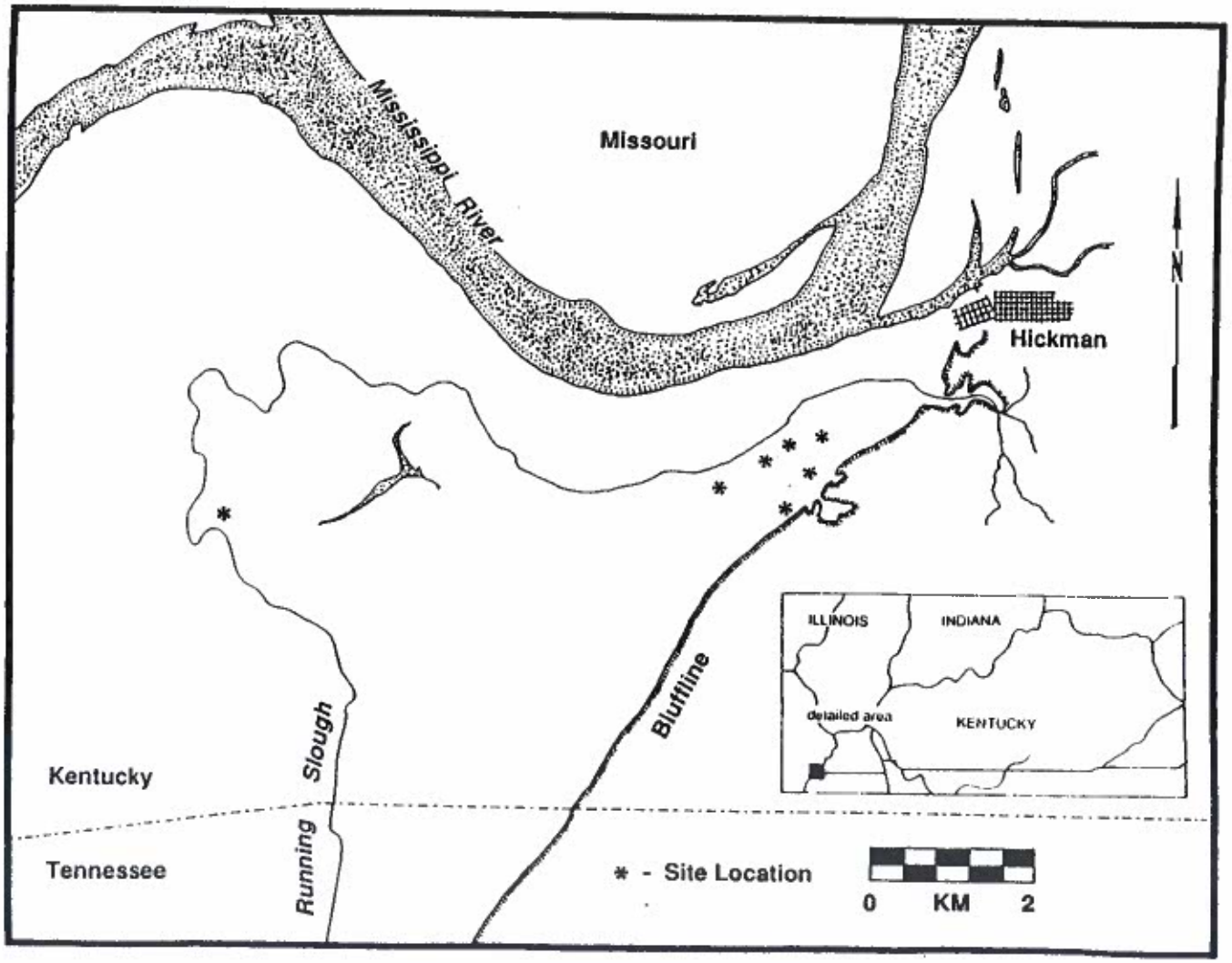

FIGURE 8. Middle Woodland Site Distribution.

Cane Hills phase, finer pastes characterize these types. Nevertheless, assemblages dating to these two phases are difficult to separate except with a large collection of rim sherds. Vessel forms and rim decoration modes are key attributes that distinguish the two phases. Also, small amounts of Kersey Incised are present in assemblages after about A.D. 700. These phases are considered together here, since most ceramic collections are too small to allow a confident differentiation between components of the two phases.

Late Woodland components are present at 45 sites on the Big Bottoms (Figure 9). Site sizes range from 0.1-16 ha. Most (80%) are under 1 ha in extent, 11% are between 1-2 ha in size, and 9% are greater than 2 ha in extent. Only two sites, 15Fu17 and 15Fu18 are greater than 10 ha in extent. Most (75%) of the sites greater that 2 ha in extent are associated with mounds.

While this distribution of the size and facilities of the various sites is suggestive of a settlement hierarchy, the exact nature of this organization is not well understood at present. Sites under 1 ha correspond to farmsteads, those between 1-2 ha to hamlets, and those greater than 2 ha, some of which have mounds, are village-sized. Locationally, the sites can be roughly subdivided into 3 clusters; one just west of Hickman, a second surrounding 15Fu18, and a third north of the modern community of Sassafras Ridge. Rice (15Fu18), which contains three mounds and a village area of about 16 ha, is the largest Late Woodland settlement on the Bottoms.

Most Late Woodland sites (80%) are located on landforms elevated between 96-100 m asl, while the remaining 6 sites are located above 100 m asl. There is no correlation between site size and its elevation. Over half (60%) of the Late Woodland sites are located on Robinsonville, Commerce and Dubbs silt loams, which are agriculturally productive and well drained soil types. Almost 20% of the remaining sites are located on Beulah fine sandy loam, which has rather poor agricultural potential, but is one of the best drained soils on the Big Bottoms. Most sites located on this soil type are small, but a few are villages. Two reasons may account for locating settlements on well drained soils; better growing ability during wetter agricultural seasons, and more importantly, drier living conditions during rainy periods of the year. The remainder of the sites are located on a number of different soil types, all of which share the characteristics of having moderately productive agricultural potential and are relatively well drained.

Site location and organization outside of the Big Bottoms changed significantly during this 500 year time span. During the Berkely phase (A.D. 400-600), sites tended to be small and were located on the floodplains, overlooking small streams, on

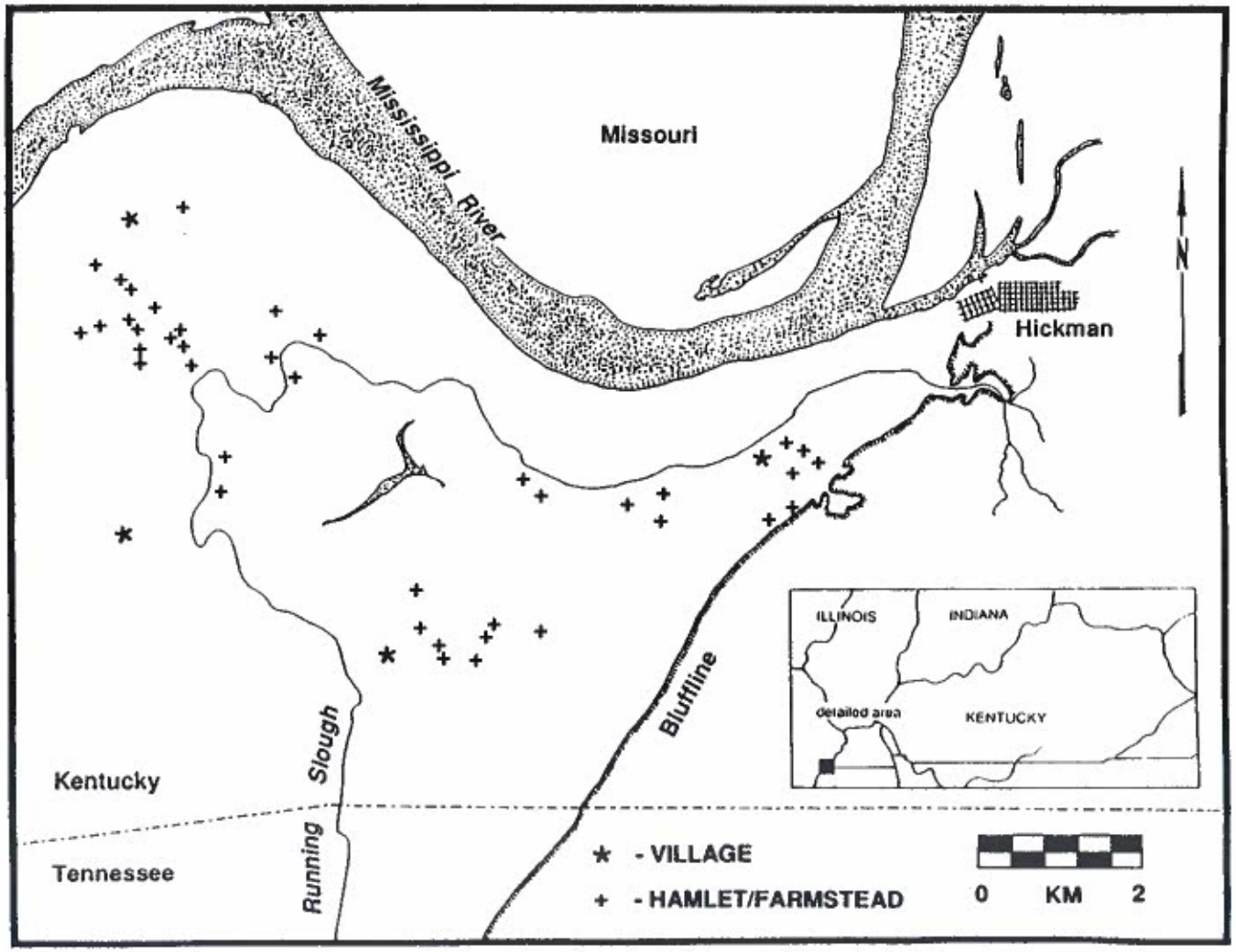

FIGURE 9. Late Woodland Site Distribution.

bluffcrests, and in the dissected uplands. At some point during the Cane Hills phase (A.D. 600-900) the number of different site functions increased and a settlement hierarchy emerged. Site locations also changed, with fewer sites being occupied in the small stream drainages or in the dissected uplands. Typical site locations include the floodplain levees and terraces of the Mississippi and Ohio Rivers, and on the bluffcrests overlooking these river valleys (Sussenbach and Lewis 1987).

Mississippi Period

James Bayou and Dorena Phases (A.D. 900-1300)

The James Bayou and Dorena phases are defined, in part, by the lack of decorated Mississippian ceramics such as Matthews Incised or O'Byam Incised, although Kersey Incised and Yankeetown materials may be present during the James Bayou phase. Additionally, fine paste varieties of Baytown Plain and Mulberry Creek Cordmarked date to the James Bayou phase, as does a grog-tempered variant of Kimmswick Fabric Impressed. High frequencies of red-filmed ceramics are also associated with this early portion of the Mississippi period. Finally, assemblages dominated by Mississippi Plain and Bell Plain have been attributed to the Dorena phase.

In summary, the James Bayou and Dorena assemblages differ basically from those of the Late Woodland in the presence of shell tempered ceramics and the lack of coarse paste varieties of Baytown Plain and Mulberry Creek Cordmarked. James Bayou and Dorena phase assemblages differ from later Mississippi period phases in the relative lack of Matthews Incised, O'Byam Incised, and other decorated types.

Thirty-five James Bayou and Dorena components have been recorded in the Big Bottoms (Figure 10). Site sizes range from 0.1 ha to as large as 8 ha. Of this total 28 sites are smaller than 1 ha, four are between 1-3 ha, two are between 3-5 ha, and one is over 5 ha in extent. The largest component, Sassafras Ridge, is best known for its post-A.D. 1300 occupation. Mound construction at Sassafras Ridge began as early as the Dorena phase. One other site in the Bottoms, 15Fu16, had an associated mound. Settlement sizes suggest a hierarchy similar to the preceding Cane Hills phase, with the exception that a planned town, Sassafras Ridge, was incorporated into the settlement system.

James Bayou and Dorena phase sites can be geographically divided into two diffuse spatial clusters in the eastern and western portions of the Big Bottoms. Each cluster has a site

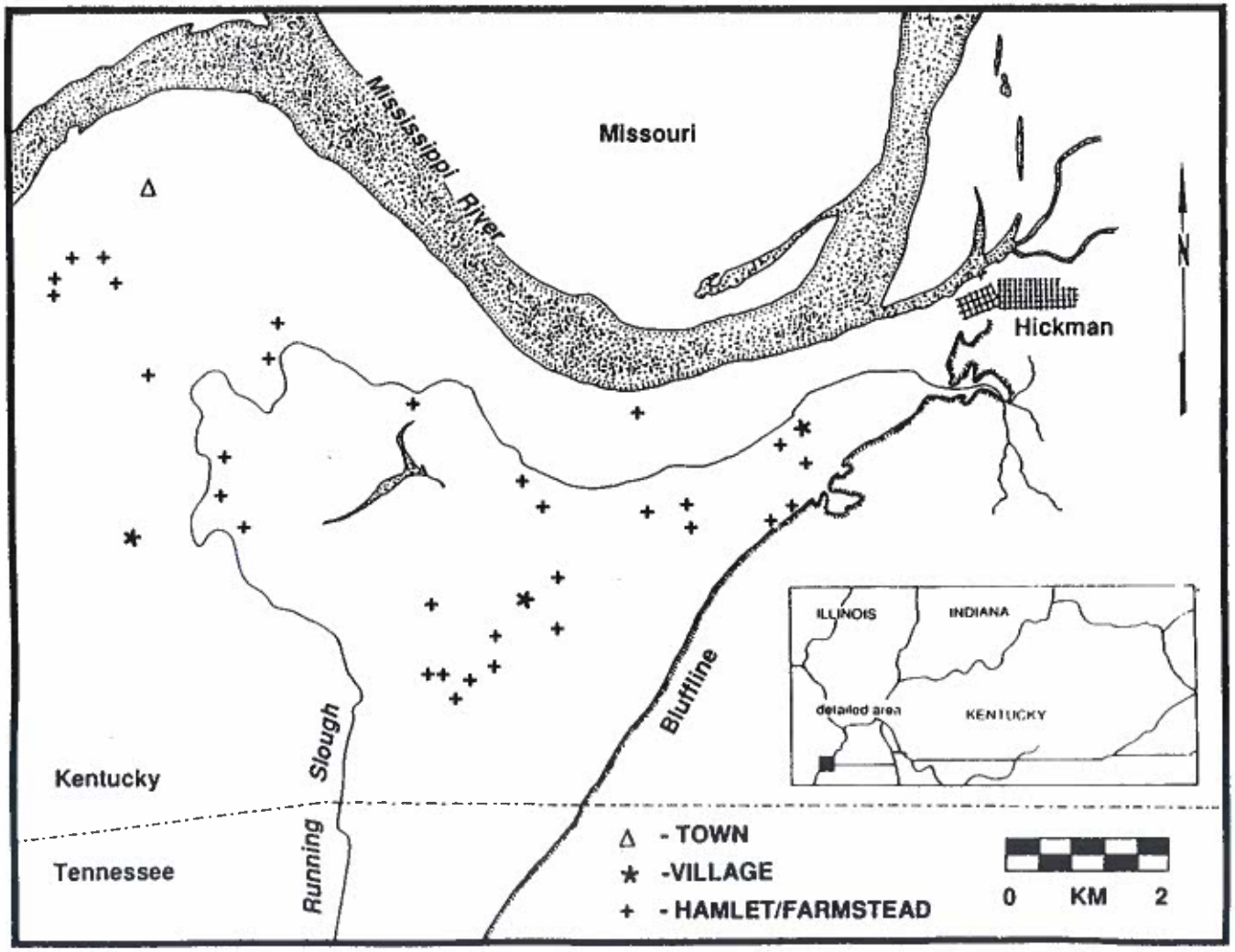

FIGURE 10. James Bayou-Dorena Phase Site Distribution.

with a mound and an additional village. The remaining settlements are comprised of hamlets and farmsteads. No sites have been found in the area that separates these clusters, which has an elevation between 91-95 m asl, somewhat low for settlement on the Big Bottoms. This may indicate the area was subject to frequent inundation prior to the construction of the modern levee system. The low area may have been a natural barrier resulting in settlement clustering.

Site elevations range between 96-102 m asl. Most sites (86%) are between 96-100 m asl. The largest sites are all located between 98-100 m asl, while small sites are located in all elevation ranges. Most sites (71%) are located on Robinsonville and Dubbs silt loam and Beulah fine sandy loam. Only farmsteads and hamlets are located on Beulah fine sandy loam. The remaining 10 sites are located on a number of agriculturally productive soil types. All sites but one are located on extinct natural levees. The exception is located on Sharkey clay. This soil type develops in slack water areas of the Mississippi River, is lower in elevation, less well drained, and more prone to inundation.

Major James Bayou mound and habitation sites are located about 10 km south of the Big Bottoms around Reelfoot Lake (Mainfort and Kreisa 1988; Mainfort et al. 1986). Except for 15Fu16, no mound sites were occupied on the Big Bottoms during the James Bayou phase. This may indicate that political control of the Reelfoot Lake Basin was located to the south around Reelfoot Lake, or that a very diffuse political structure was in place at this time. By the Dorena phase, power may have been consolidated at Sassafras Ridge -- no town was occupied around Reelfoot Lake after A.D. 1200 (Mainfort and Kreisa 1988).

During this period, basic patterns characteristic of Mississippian culture became apparent. Throughout this 400 year interval, towns such as Adams, McLeod Bluff, Wickliffe, and Turk were established (Edging 1985; Lewis 1986; Webb and Funkhouser 1933; Wesler 1989). Mound and village patterns at each site suggest a planned settlement (Stout 1987). It is also at this time that subsistence shifts to include larger amounts of maize (Sussenbach and Lewis 1987). Nuts and seeds remain important food items (Rossen and Edging 1987). Settlements outside of the Bottoms were hierarchically organized, with sites clustering along the bluffcrest or on river bottoms (Sussenbach and Lewis 1987). It has long been assumed that the development of the Mississippian settlement hierarchy was mirrored by the rise of social hierarchies.

Medley Phase (A.D. 1300-1500)

The main criterion for cross-dating surface collected sites to the Medley phase is the presence of decorated ceramics such as Matthews Incised and O'Byam Incised, along with a few other decorated types found in lesser amounts. Excavated Medley phase assemblages in the Confluence region usually have less than 5% decorated sherds. Given this, it is apparent that the identification of Medley phase components from surface remains is related to the size of the ceramic assemblage obtained during survey.

By comparing the minimum collection size needed to obtain a Medley phase decorated sherd with the sample sizes obtained during the Big Bottoms survey, it should be possible to determine whether Medley components were missed due to sampling alone. In order to assess this possibility, surface collections were analyzed from a sample of 25 Medley phase sites (Table 4). The number of decorated sherds at these sites range from 0-262, with total sample sizes ranging from 17-2,240. A regression of number of decorated sherds present and sample size indicates a positive correlation between sample size and number of decorated sherds collected (R=0.68). When nine sites with sample sizes over 900 sherds, or in the case of one, no decorated sherds, are deleted from the analysis, the correlation increases (R=0.75). These sites, 15Ba2, 15Ce6, 15Fu16, 15Fu19, 15Fu24, 23Mi1, 23Mi2, 23Mi8, and 23Mi55, are the most widely scattered from the orginal regression slope. The correlation and the strong clustering of points around the regression line (Figure 11) suggests that sample size has a great impact on the ability to find a decorated sherd.

The original regression formula (Y=1.145+1.55e-3x) predicts that one decorated sherd will be obtained if samples approaching 250-300 sherds are collected. While decorated sherds can be obtained with lower sample counts, the probability is less likely. This may be especially true of smaller sites. If so, it indicates that most collections obtained during the Big Bottoms survey are insufficient to identify possible Medley phase components.

I infer that there are more Medley phase sites on the Bottoms than have been identified here. Earlier research (Kreisa 1987, 1988) had also noted the paucity of Medley phase sites on the Bottoms. Several possible reasons were suggested, including sample size effects, population nucleation, or population decrease. At this point, sample size effect must assume priority as an explanation.

Six Medley phase sites have been identified on the Bottoms (Figure 12). These include a major mound center at Sassafras Ridge, a village (15Fu19) over 5 ha in extent, three hamlets

TABLE 4. Decorated Ceramics from Surface Contexts at Medley Phase Sites.

Site	Number of Decorated Sherds	Sample Size	Sources
KENTUCKY			
15Ba2	16	1175	Clay n.d.; Kreisa 1988
15Ba10/48	2	226	Clay n.d.; Weinland and Gatus 1979
15Ba14	1	176	Clay n.d.; Kreisa 1988
15Ba20	1	57	Clay n.d.
15Ba26	2	277	Clay n.d.
15Ba31	5	298	Clay n.d
15Ce6	37	1622	Clay n.d.; Edging n.d.
15Fu1	4	249	Clay 1961
15Fu3	8	491	Clay n.d.; Lewis n.d.; Mackin 1986
15Fu4	41	827	Clay n.d; Lewis n.d
15Fu14	4	60	Clay 1961
15Fu16	7	964	Clay 1961; Kreisa 1988
15Fu19	6	960	Mainfort n.d.
15Fu20	9	318	Kreisa 1988
15Fu21	18	394	Schock and Langford 1978
15Fu24	0	69	Sussenbach and Lewis 1987
15Fu67	13	206	Wolforth n.d.
15Fu105	1	17	This Report
15Fu310	2	32	Schock and Langford 1978
15Hi1	55	758	Clay n.d.
15Hi13	2	79	Clay 1961
15Hi15	7	325	Kreisa 1988
15McN18	1	155	Clay n.d.
15McN24	2	145	Butler et al. 1981

TABLE 4. Concluded.

Site	Number of Decorated Sherds	Sample Size	Sources
MISSOURI			
Charleston	2	268	Williams 1954
Medley	6	104	Williams 1954
Meyer's Mound	2	414	Williams 1954
Barker	10	586	Williams 1954
Spanish Grant	2	178	Williams 1954
East Bayou	15	622	Williams 1954
Beckwith's Fort	38	1106	Williams 1954
Lilbourn	5	625	Williams 1954
23Mi1	262	2240	Lewis n.d.; Williams 1954
23Mi8	1	1460	Hopgood 1969; Lewis n.d.
23Mi53	1	94	Williams 1968
23Mi55	4	1092	Hopgood 1969; Lewis n.d.
23Mi59	7	74	Lewis n.d.
23Mi68	5	348	Hopgood 1969
23Mi71	13	273	Lewis n.d.
TENNESSEE			
40Lk1	2	206	Mainfort n.d.
40Lk2	8	459	Mainfort n.d.
40Lk3	4	332	Mainfort n.d.
40Ob97	3	109	Mainfort n.d.
40Ob1/126	8	455	Mainfort n.d.

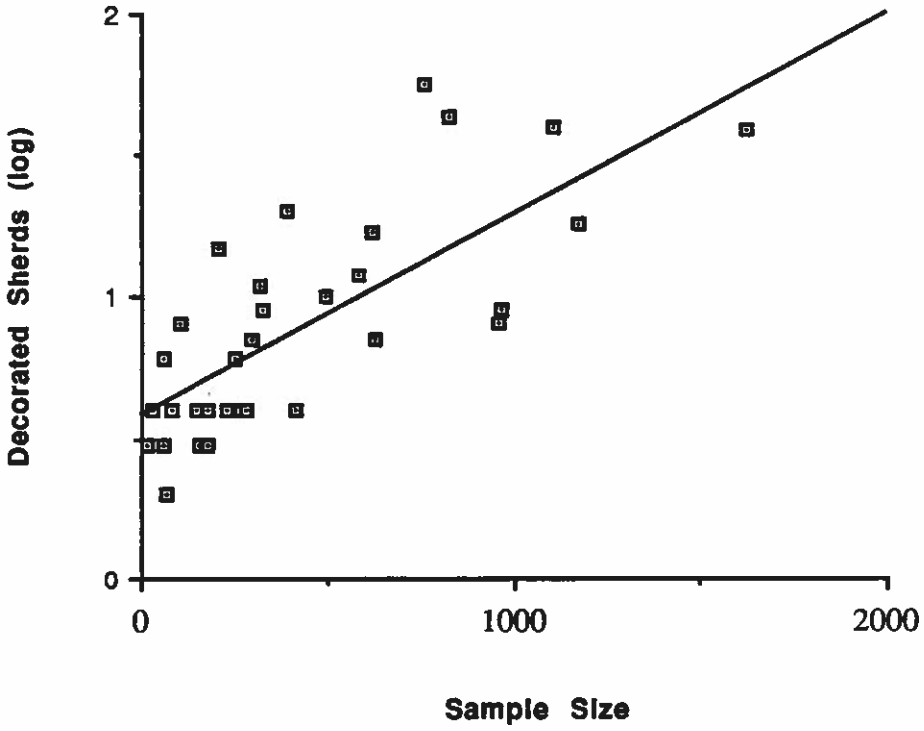

FIGURE 11. Regression of Decorated Ceramics Against Sample Size.

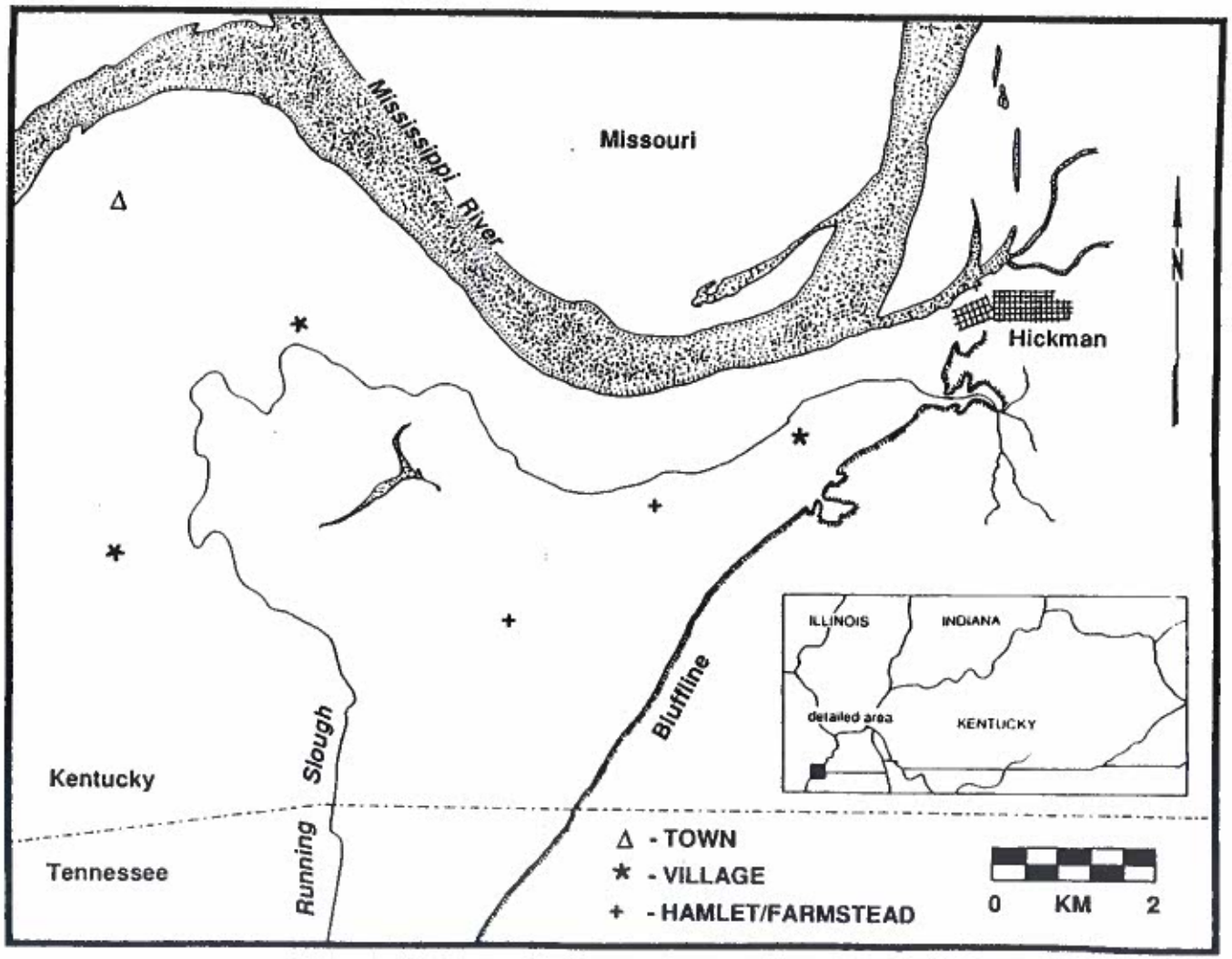

FIGURE 12. Medley Phase Site Distribution.

(15Fu16, 15Fu21, 15Fu67), and a farmstead (15Fu105). These smaller sites range in size from 0.6 to 1.5 ha. The median site size is 1.25 ha.

The sites are located on Robinsonville silt loam, although a few are partially located on Beulah fine sandy loam, and Boskett and Commerce silt loams. All are natural levees soils, which are generally well drained, agriculturally productive, and located between 98-100 m asl.

Medley phase sites are widely scattered. Three hamlets are in the eastern portion of the Bottoms on the same extinct levee remnant. Sassafras Ridge, 15Fu19, and 15Fu21 are located in the western portion of the Bottoms. During this phase, Sassafras Ridge, a settlement with a central plaza and three mounds, was the only large town in the Reelfoot Lake Basin.

Numerous towns outside of the Bottoms have Medley phase components. Along the Mississippi River in western Kentucky and southeast Missouri, towns typically have 5-10 mounds, a plaza, and large habitation areas. They are located on the floodplain and along bluffcrests. In the Ohio Valley, two large towns are present (Kincaid and Angel), along with numerous "secondary" centers (Butler 1977; Clay 1976; Muller 1986). The remainder of the settlement system consists of villages, hamlets, and farmsteads, although few farmsteads have been identified in the area between Wickliffe and Hickman, Kentucky.

Mississippian populations were clustered into towns and villages from the Big Bottoms to as far north as Wickliffe. Part of this pattern may be more apparent than real, due to the large ceramic collections needed to identify Medley components. Large ceramic collections from hamlets and farmsteads in western Kentucky may yet yield additional Medley phase occupations, and reveal a settlement pattern like that found in the Cairo Lowland of southeastern Missouri and the lower Ohio River valley (Lewis 1974, 1982; Muller 1986).

Discussion

Three major settlement pattern trends are evident in the Big Bottoms. First, few sites dating to the Archaic through the Middle Woodland have been recorded. This may be a function of natural processes, the lack of adequate diagnostics identifying these components, or relatively little exploitation of floodplain environments during those periods. The latter explanation is unlikely since numerous sites with components dating to these periods have been found outside of the Big Bottoms in western Kentucky, and in the Cairo Lowland (Chapman

1980; Hopgood 1969; Williams 1974), a similar floodplain environment across the Mississippi River.

Second, there are many Late Woodland and early Mississippi period sites. There is some indication of incipient maize cultivation in the Bottoms by circa A.D. 800 (Kreisa 1988; Kreisa and Stout 1989; Woodard 1988), as in other parts of the Midwest and Southeast (Johannessen 1988; Scarry 1988). Associated with this in western Kentucky is a trend toward fewer sites in the bluffcrests, upland stream valleys, and uplands (Sussenbach and Lewis 1987).

The final trend is a decrease in the total number of sites dated to the late Mississippi period. Sites are assigned to that time period based on the presence of incised ceramics, which make up a small fraction of most assemblages. It is likely that the small samples of ceramics from sites in the Bottoms has precluded the identification of a larger number of Medley phase components. Few hamlets and farmsteads have been dated to this time period in the Bottoms, although these are the sites at which small ceramic samples have most frequently been obtained. It is also during this time that Sassafras Ridge is incorporated into the settlement system as a town, and a change in the nature of the social system would be expected. Many of these issues are dealt with in greater detail in the next section.

ORGANIZATIONAL ASPECTS OF PREHISTORIC SETTLEMENT

The preceding descriptions of prehistoric material culture and settlement patterns are necessary for understanding settlement behavior, but do not constitute an explanation of the delineated patterns. The settlement system, defined as "the functional relationships among a group of sites" (Winters 1969:111) must be reconstructed to arrive at an understanding of prehistoric settlement behavior.

This section investigates two aspects of prehistoric settlement behavior in the Big Bottoms -- spatial and material culture patterns. Questions of site contemporaneity and size potentially hinder the investigation of these aspects of settlement. To control for contemporaneity, sites have been assigned to the Late Woodland period, James Bayou-Dorena phases, or the Medley phase. Too few data exist for any meaningful analysis of the Archaic, Early Woodland, or Middle Woodland occupations in the Bottoms.

It is difficult to estimate the size of contemporaneous sites at a given moment in time. Given the homogenous distribution of surface materials at small sites in the Big Bottoms, components appear to be of the same relative size. This is not the case at larger sites. For these, estimates are used in those cases where information exists to delimit the approximate extent of a component within a multi-component site. In other cases, sherd ratios from the components are used to estimate site size.

The first aspect of settlement to be addressed is the nature of relationships between sites, including indications of settlement hierarchies and population change. This is investigated using rank-size distributions, estimates of the total area occupied, and a nearest-neighbor analysis. The second aspect involves material culture, and investigates the development of site types. The discussion is limited to the analysis of ceramics and lithics. Of foremost interest is whether artifact types are distributed across the Big Bottoms regardless of site size and location, or whether artifact types cluster at certain site types or locales. By comparing sites through time, developmental trends can also be detected. The implications and methods used in these analyses are described in the appropriate sections.

Spatial Aspects of Settlement

Rank-Size Relationships

Rank-size analysis has been widely used (Blanton 1976; Haggett 1965, 1972) to identify and explain discontinuities in settlement systems, and their development through time. The rank-size relationship posits that settlement patterns have a population size distribution in which settlements, when ranked in a descending order by population size, form a log-normal linear relationship. In other words, a settlement of rank R has a population equal to 1/R that of the largest settlement in the system (Johnson 1977, 1981; Voorrips 1981).

Most analyses of rank-size relationships operationalize population as site size (cf. Johnson 1977:495), which is also done here. Although a 100% coverage of the survey area is desirable, the survey coverage of all landscapes should yield an adequate data base. Survey in the Big Bottoms includes the coverage of all landforms and elevations. And as Johnson (1981) has indicated, trends in rank-size relationships should be used with other lines of evidence when interpreting changes in settlement systems. The interpretation of the results in conjunction with other evidence diminishes possible errors in interpretation.

Throughout late prehistory in the Bottoms, the size structure of settlements remains fairly stable (Figure 13). Most settlements are under 1 ha in size, with a maximum extent of ca. 16 ha being reached at a couple of sites. During the Medley phase, few small sites, <1 ha in size, are present, and it is argued later in this section that these sites are under-represented in the sample.

For the rank-size analysis, site area was transformed using a logarithm to base 10 and then plotted. The plots (Figure 14) for each time period are similar, all being somewhat concave. Concave rank-size distributions have been called a "primate" pattern (Berry 1961). Berry attributes primate patterns to the presence of extremely large and very small sites in a settlement system. Fewer mid-level sites than expected were present prehistorically in the Bottoms. Interaction would have been between the largest and smallest sites, perhaps indicating the lack of a mid-level settlement and social hierarchy. This can be interpreted as representing a simplier form of a chiefdom social organization.

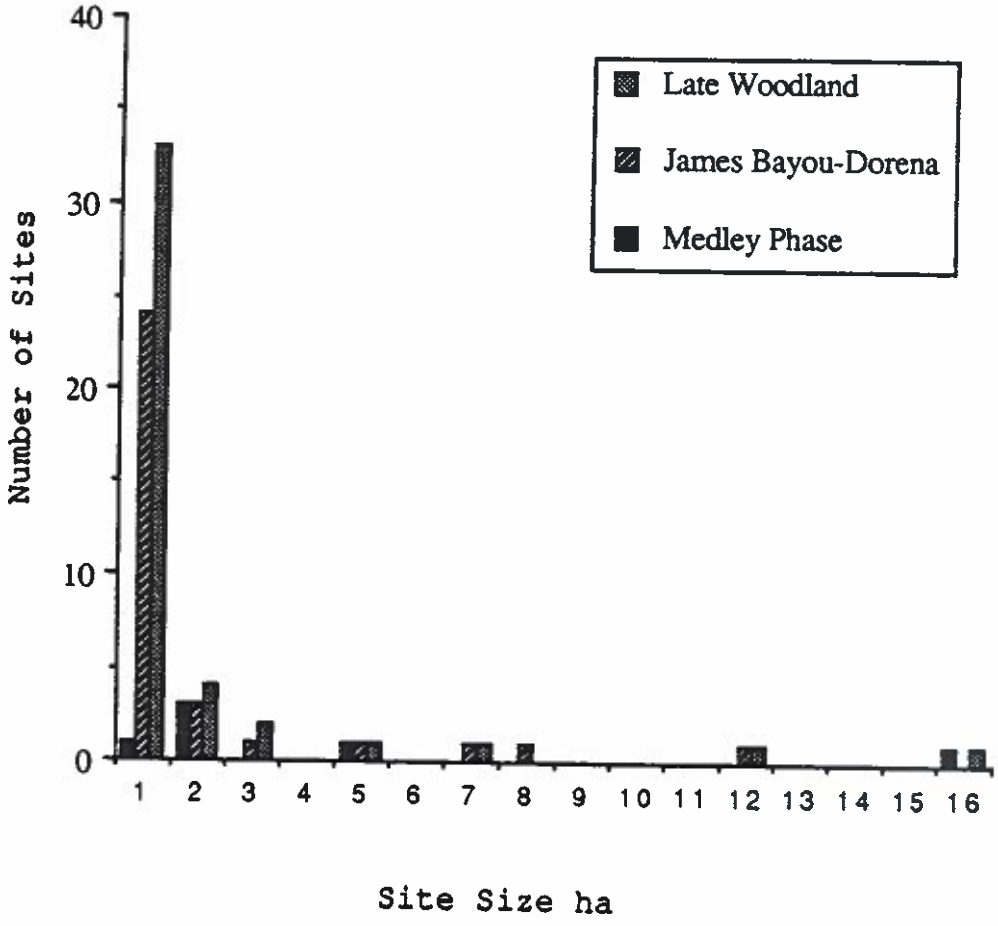

FIGURE 13. Histogram of Site Sizes By Time Period.

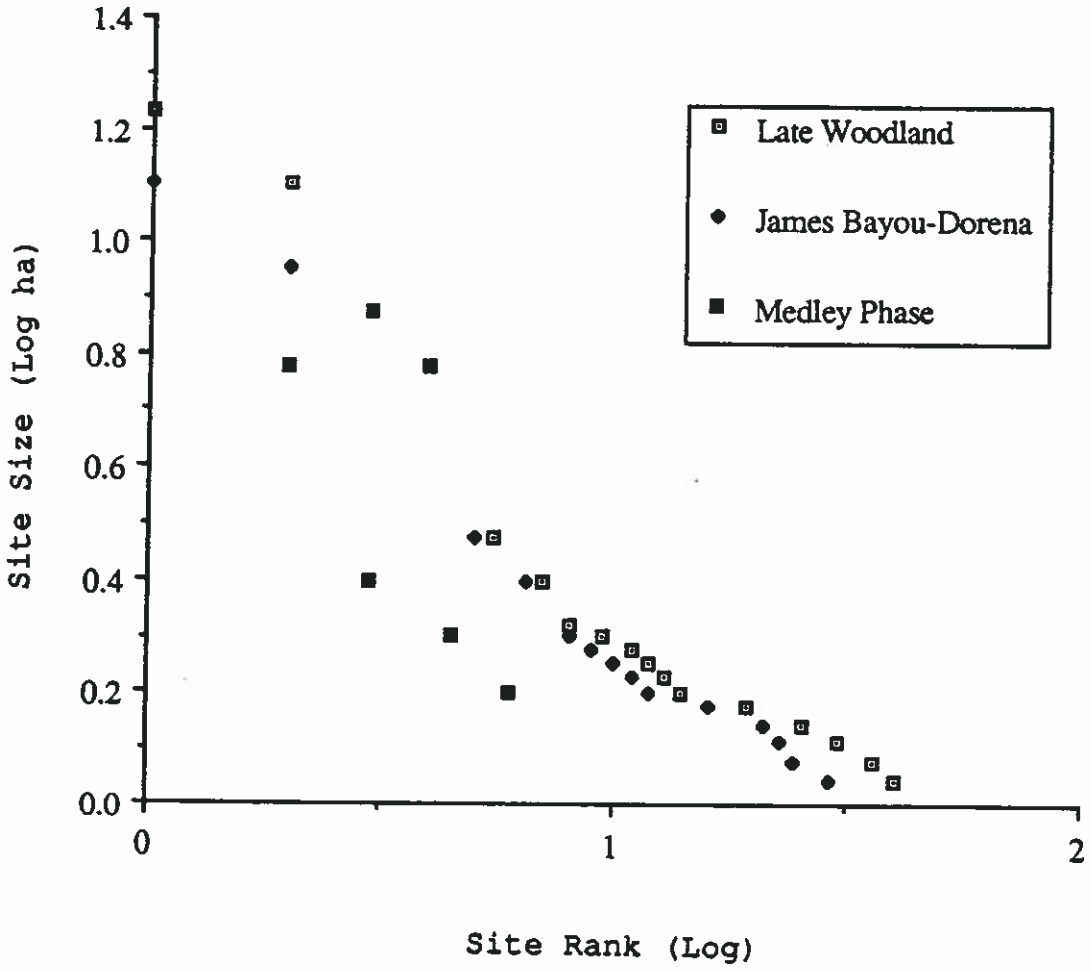

FIGURE 14. Rank-Size Distribution of Sites By Time Period.

Site Area Trends

Based on inspection of the raw data, it appears that Mississippian occupation of the Bottoms decreased sometime after A.D. 1300. Previously, it had been hypothesized that while the number of sites decreased from the Late Woodland through the Mississippi period, total site area on the Bottoms remained relatively stable (Kreisa 1987). However, this is not the case. Using site size estimates, Late Woodland site areas total 51 ha, James Bayou-Dorena phases 39 ha, and the Medley phase 25 ha.

But, it must be remembered that each period or phase represents unequal amounts of time -- the Late Woodland period is 500 years, the James Bayou-Dorena phases are 400 years, and the Medley phase is 200 years. Based on this alone, fewer Medley phase sites would be expected. When the site area totals given above are standardized by length of time period, Late Woodland components have a total site area of 5.7 ha/100 years, James Bayou and Dorena components 9.3 ha/100 years, and Medley components 12.5 ha/100 years. As presented earlier in this report, it is likely that fewer Medley phase sites have been found than are actually present in the Big Bottoms. This is due to the necessity of obtaining large ceramic samples from sites, and would tend to under-represent the smallest sites -- farmstaeds and hamlets. This alone would cause an under-estimation of the total site area occupied during the Medley phase, and hence the estimate of over 12 ha/100 years represents a low figure. Population density was probably higher during this phase than during any other prehistoric phase. It can be concluded that population size actually increased through time, including into the Medley phase.

Nearest-Neighbor Analysis

Nearest-neighbor analysis consists of a number of techniques used to evaluate the spatial distribution of points in a given area (Hodder and Orton 1976). The technique used here measures the distance between a site and its nearest neighbor. An observed mean nearest-neighbor distance is calculated, and compared with an expected mean nearest-neighbor distance, which is based on an assumed random distribution of sites. When the ratio of observed to expected mean nearest-neighbor distances (R) approaches 1, sites are randomly distributed. When the ratio is 0, sites are clustered together, while a ratio above 1 indicates a regular site distribution pattern (Clark and Evans 1954).

The ratio of observed to expected mean nearest-neighbor distances for Late Woodland sites on the Big Bottoms is 0.38, which is interpreted as an aggregated settlement pattern. As

previously discussed, Late Woodland sites cluster into "neighborhoods," due to environmental factors such as the need for dry and arable land. Sites larger than 1 ha have smaller sites as their nearest-neighbor, indicating two-tiered settlement hierarchy was in existence in the Big Bottoms during the Late Woodland period.

An essentially similar nearest-neighbor ratio was obtained (R=0.45) for James Bayou-Dorena phase sites. The clustering of settlements continued, as does the presence of neighborhoods (Kreisa 1987). Most sites greater than 1 ha in extent have smaller sites as their nearest-neighbor, again suggesting the continuation of a two-tiered settlement hierarchy much like that of the Late Woodland period.

Finally, an increase in the nearest-neighbor ratio (R=1.6) is obtained for the Medley phase. This ratio is suggestive of regularly spaced site pattern. Biases due to the small sample size may influence the ratio.

Discussion

Similar patterns for the Late Woodland period and James Bayou-Dorena phases were obtained from the three spatial analyses. Rank-size analysis indicates a stable site size structure, although the total area occupied increased somewhat through time. The settlement structure consisted of clustered neighborhoods, within what appears to be a two-level hierarchy. Neighborhoods consisted of one or more villages surrounded by numerous farmsteads, and isolated from one another by floodplain topography. These patterns may have changed during the Medley phase with an increase in site area occupied, possibly larger populations, and a different site distribution pattern.

Locational Aspects of Material Culture

Theories of Mississippian social organization are examined in this section, which focuses on a locational analysis of material culture. The model of Mississippian settlement systems most often cited by archaeologists consists of a hierarchy of several site types, including towns, villages, hamlets, and farmsteads (Green and Munson 1978; Griffin 1985; Krause 1985; Peebles 1978; Peebles and Kus 1977; Smith 1978; Steponaitis 1978). Contrasted with this is the position taken by Muller (1978, 1986, 1987), who feels that few social differences existed within Mississippian societies, as evidenced by the lack of differentiation of material culture between towns, villages, hamlets, and farmsteads in the Black Bottom of southern Illinois.

Residuals Analysis

This section examines the possibility that differences in assemblage diversity between site types exist. Thomas (1983) has examined the assumptions behind analyses of assemblage diversity in the identification of site types. Assemblage diversity is assumed to be associated with population size, site function, and activity diversity at sites. For the Mississippian settlement system, towns should have the highest artifact diversity and high artifact density. Farmsteads and/or specialized extractive locales should have the lowest artifact diversity and low artifact density. Villages and hamlets will fall between these two extremes.

Measures of diversity are often affected by sample size. The diversity of artifact types is correlated with sample size, so that the largest samples tend also to be the most diverse (Grayson 1984; Jones et al. 1983; Rhode 1988; Thomas 1983). In this regard, a simple plot of number of artifact types against sample size often tells more about collection techniques than about assemblage diversity, especially when the sample size is small (Thomas 1983).

A two-step process of investigating assemblage diversity is used here (Thomas 1983). First, an estimate of the extent of the sample size effect is obtained. Second, assemblage variability independent of sample size is analyzed. Thomas (1983) suggests four avenues for the investigation of this variability; 1) quantitative investigation of reasons behind the differences in sample size; 2) qualitative investigation of the artifact types which comprise site type assemblages; 3) comparison of regression slopes of different site types; and 4) analysis of the residuals.

The approach used here concentrates on residuals, although comparisons of slopes and a qualitative investigation of artifact types are also used. Residuals represent unexplained variability, or that portion of assemblage diversity that varies independently of sample size effects (Hartwig and Dearing 1979).

Ceramic and lithic assemblages are analyzed here. Assemblage size has been standardized for site size, since large sites should yield more artifacts due to the larger size of the collection universe. This has been done by dividing sample size by site area to yield an adjusted sample size. The correlation between the number of artifact types and adjusted sample size was determined to obtain the strength of the sample size effect.

Data included in this analysis were obtained from the Big Bottoms survey and other sources (Clay 1961; Klinger et al.

1983; Lewis n.d.; Mackin 1986; Mainfort n.d.; McGraw 1981; McNerney and Nixon 1980; Schock and Langford 1978; Wolforth n.d.). Sites were grouped into <1 ha or small sites and >1 ha or large sites for analysis. Once residuals from a regression of adjusted sample size and artifact diversity were obtained, they were plotted against site size, number of mounds present, and soil productivity. A correlation coefficient of determination (R^2) was also calculated for these relationships. This was chosen to assess the strength of the relationships and the amount of variation the relationship explains. Lewis-Beck (1980) suggests that it is preferable to the correlation coefficient (r) for those purposes.

Analysis of the relationship between sample size and diversity indicates it is a minor factor for Late Woodland period and James Bayou-Dorena phase ceramics and lithics. For each, sample size accounts for less than 20% of assemblage variability. Sample size accounts for 27% of the Medley phase ceramic assemblage variability, but 82% of the lithic variability. From this it can be concluded that sample sizes have little effect on Late Woodland and James Bayou-Dorena phase artifact diversity, but a greater effect on Medley phase artifact diversity.

Late Woodland Period

The plot of the ceramic residuals against site size reveals a positive linear relationship (Figure 15). Sites >1 ha have a more diverse assemblage than sites <1 ha in extent, with little overlap between the two distributions. Site size accounts for 30% of this variability. Large sites without mounds have as or more diverse assemblages than sites with mounds, and sites with both high and low ceramic diversity are present on all soil types.

A plot of the lithic tool residuals against site size suggests little difference between the lithic tool inventories of large and small sites (Figure 16). Site size is positively correlated with and accounts for 47% of the variability, although much overlap is present between the lithic tool inventories of large and small sites. Mound sites have slightly more diverse assemblages than other large or small non-mound sites. Soil productivity, though, is weakly correlated with tool diversity.

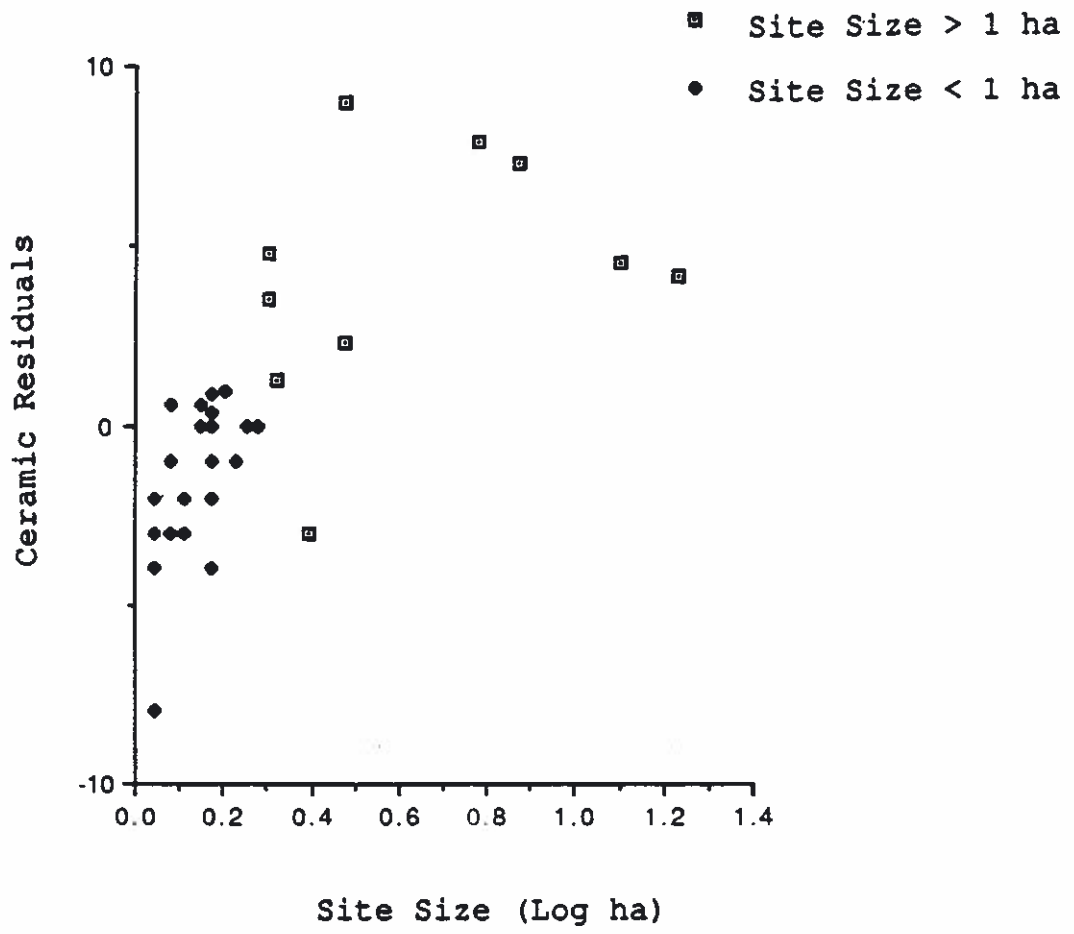

FIGURE 15. Scattergram of Late Woodland Ceramic Diversity.

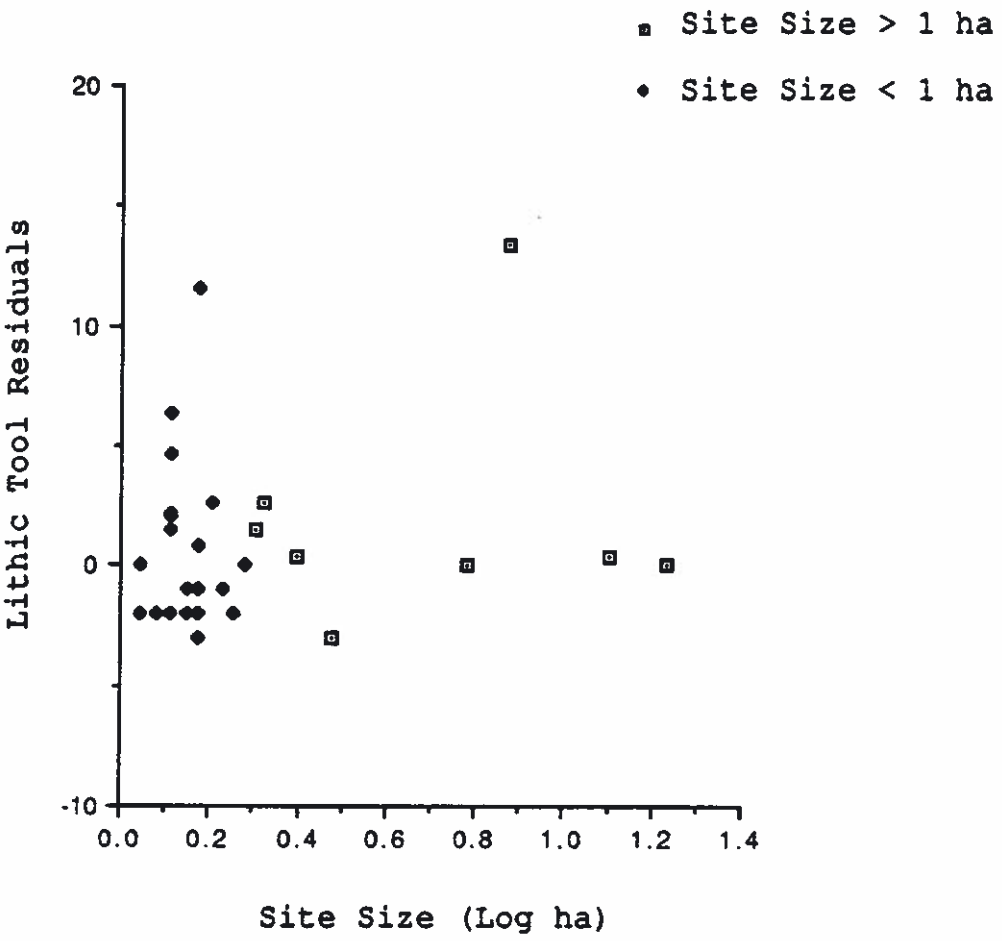

FIGURE 16. Scattergram of Late Woodland Lithic Diversity.

James Bayou and Dorena Phases

The relationship between site size and ceramic diversity during the James Bayou and Dorena phases is positive, and when plotted, a linear pattern can be noted (Figure 17). Larger sites tend to have a more diverse ceramic assemblage than do smaller sites. Within the large sites, two clusters can be separated, those over 5 ha in extent and often with mounds, have the most diverse assemblages, and those 1-2 ha in extent which most often are not associated with mounds and have less diverse ceramic assemblages. Sites under 1 ha in extent have the least diverse assemblages of all sites. The presence of mounds is weakly but positively correlated with ceramic diversity (R^2=.26), although other large, non-mound sites also tend to have diverse assemblages. Soil productivity and ceramic assemblage diversity are not correlated.

The relationship between lithic tool diversity and site size is also positive and linear (Figure 18). But, except for two large sites, the pattern is similar to that of Late Woodland period lithic assemblages. Site size alone accounts for over half of the variability, with large sites having more diverse assemblages than small sites. Neither the presence of mounds nor soil productivity are strongly correlated with lithic tool assemblage diversity.

Medley Phase

When ceramic diversity is plotted against site size, an asymptotic distribution is obtained (Figure 19). Large and small sized sites have somewhat different ceramic assemblages. The largest sites are Sassafras Ridge (15Fu3), a large Mississippian town with the most diverse ceramic assemblage, and 15Fu19, a large village which has a slightly less diverse assemblage. With generally less diverse assemblages are a number of hamlet-sized sites and 15Fu105, a farmstead-sized site with the least diverse assemblage. Site size accounts for almost half of the variability within the ceramic assemblages. The presence of mounds also is highly correlated with ceramic assemblage diversity.

Lithics have an asymptotic pattern (Figure 20), much like that of the Medley phase ceramics. Sample size is highly correlated with lithic tool diversity indicating that large samples are more diverse, with large samples present at the largest sites. The remaining unexplained variability suggests that site size, the presence of mounds, and soil productivity are poorly correlated with lithic tool diversity.

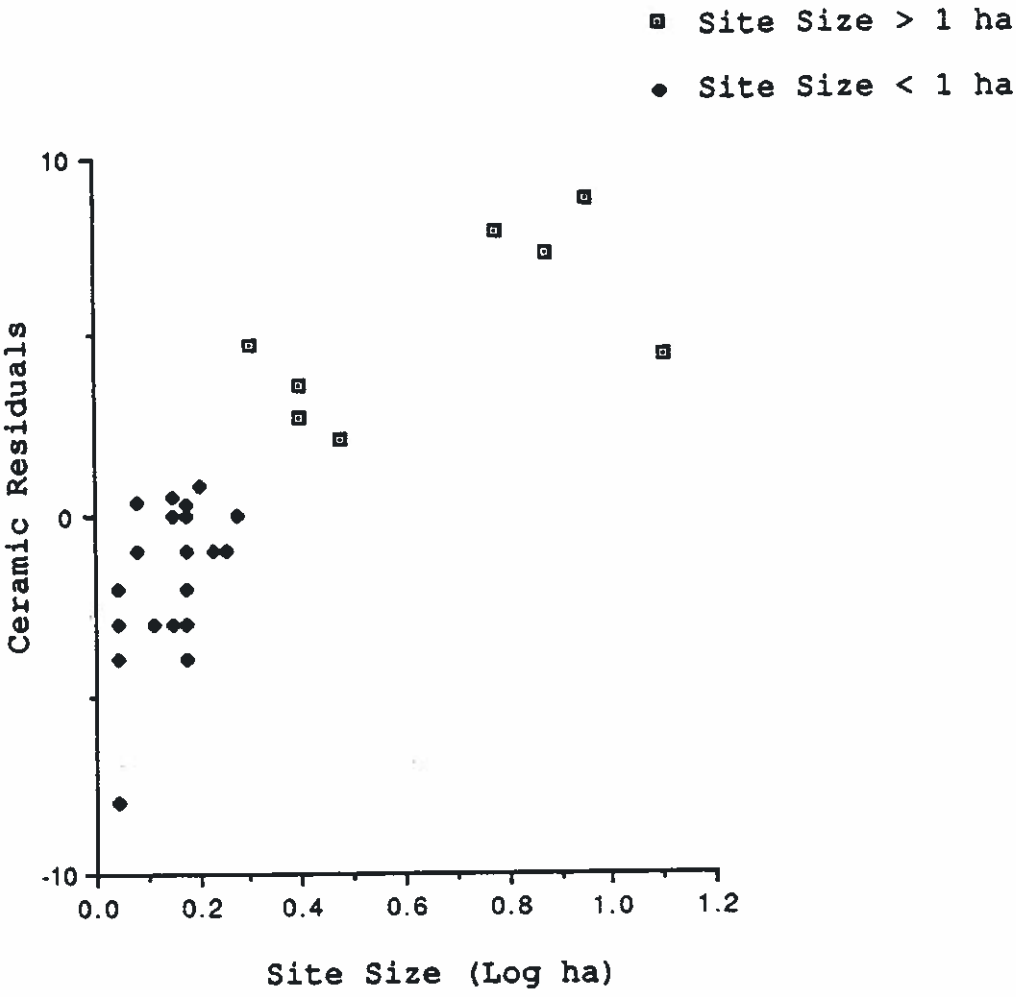

FIGURE 17. Scattergram of James Bayou-Dorena Phase Ceramic Diversity.

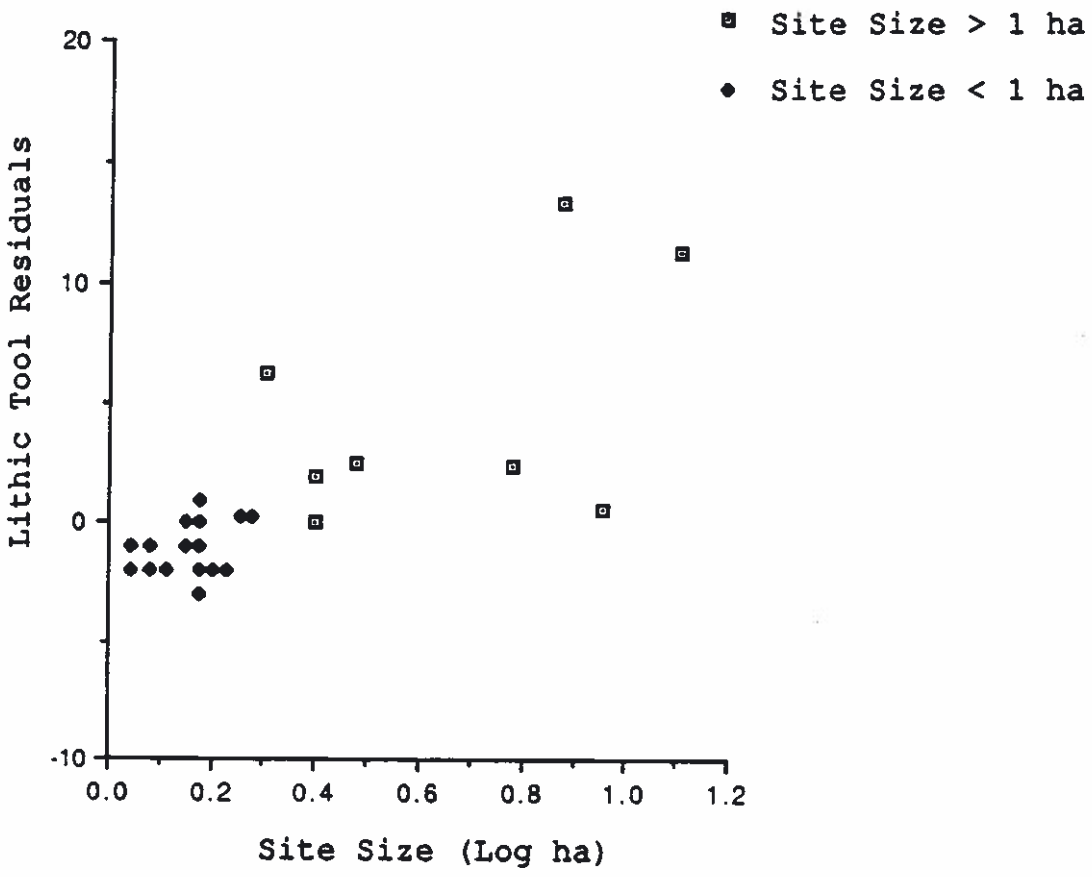

FIGURE 18. Scattergram of James Bayou-Dorena Phase Lithic Diversity.

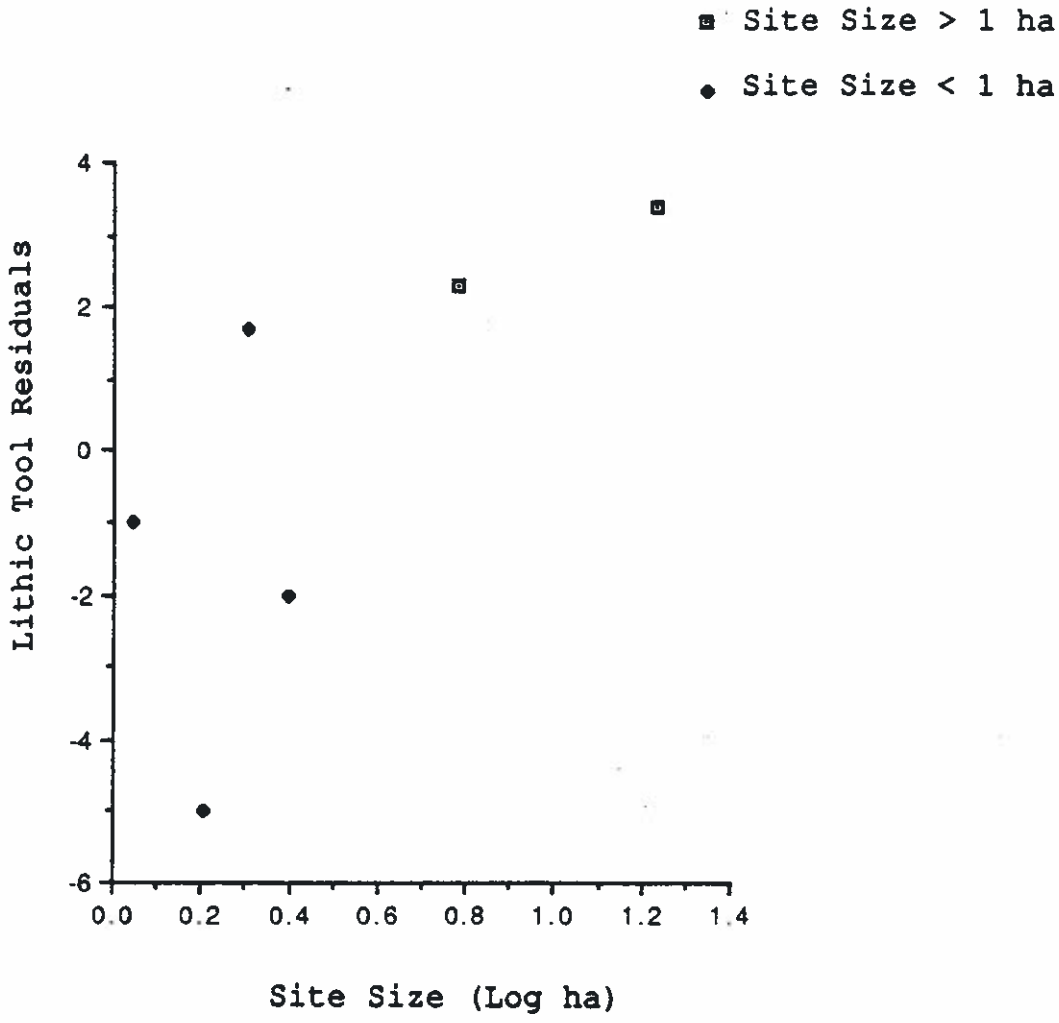

FIGURE 20. Scattergram of Medley Phase Lithic Diversity.

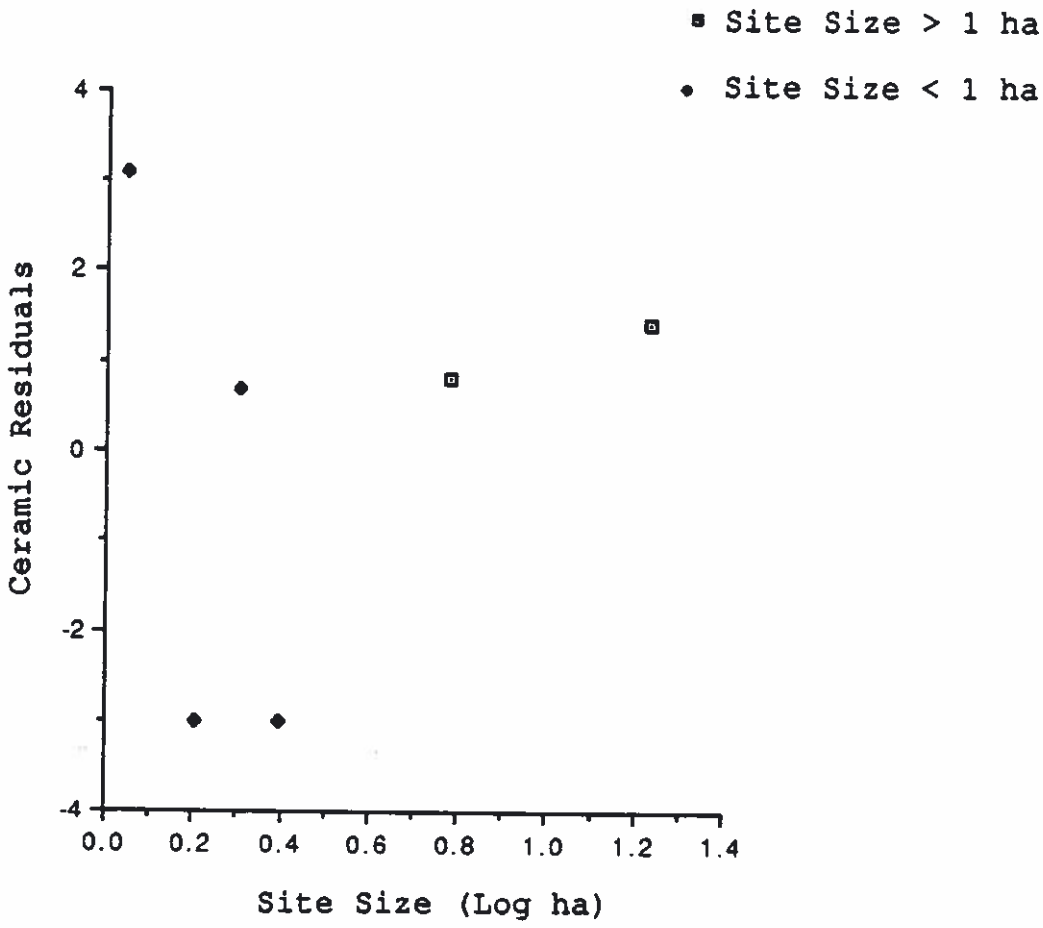

FIGURE 19. Scattergram of Medley Phase Ceramic Diversity.

Discussion

The analysis of residuals indicates a positive and somewhat linear relationship between site size and ceramic diversity for the Late Woodland period and the James Bayou-Dorena phases. Two levels of settlement, small sites and villages, were present during these times. The plot of ceramic diversity changes during the Medley phase to an asymptotic pattern, which may represent a multi-tier settlement system. Through time, the number of mounds at a site is positively though weakly correlated with ceramic diversity. Soil productivity is never correlated with ceramic diversity.

Trends in the lithic assemblage differ from those of the ceramic assemblage throughout late prehistory. Little difference between small and large sites is present. It is likely that both maintained a tool assemblage that was necessary for agriculture, hunting, maintenance, and the production of goods. Larger sites, due to larger populations, would have needed greater amounts of material and perhaps a few additional tools. In essence, all sites required the same tools to obtain subsistence and material needs. There is little association between number of mounds and tool diversity during the Mississippi period, although this is not the case during the Late Woodland period. Soil productivity is not associated with tool assemblage diversity.

Regression Slopes

Numerous authors have suggested that a comparison of regression slopes can reveal different patterns between classes of data (Jones et al. 1983; Schlanger and Orcutt 1986; Thomas 1983). Similarity between slopes is assumed to indicate a similar patterning of data, while different slopes indicate a different relationship between the variables. In this analysis, regression slopes for Late Woodland period and James Bayou-Dorena phase sites are compared.

The regression slopes for ceramics (Figure 21) are basically similar for both time periods. Both regression slopes are positive, suggesting that ceramic diversity increases with site size. Lithic assemblages (Figure 21) exhibit a pattern different from that of ceramics. Both Late Woodland period and James Bayou and Dorena phase sites show a slower increase in lithic tool diversity as site size increases. The similarity between the Late Woodland and James-Bayou Dorena phases regression slopes suggests a continuity in the manner that material culture was being orgainized within the settlement systems. The pattern of Medley phase ceramics and lithics are both asymptotic, most probably a result of

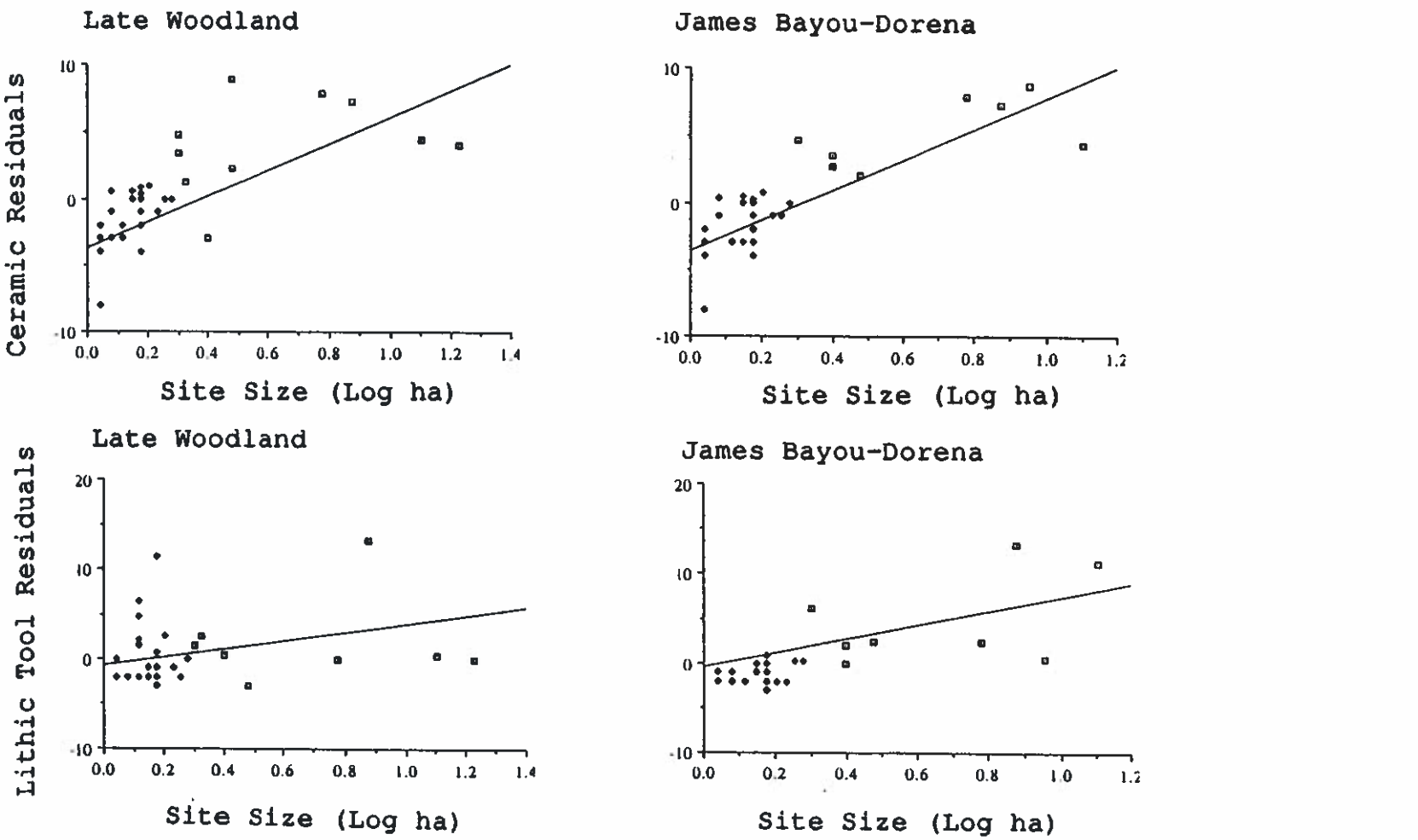

FIGURE 21. Comparison of Late Woodland and James Bayou-Dorena Phase Ceramic and Lithic Diversity.

small samples, but also perhaps an indication of changes in the way material culture was being organized.

Qualitative Trends

If differences in assemblage diversity are present, specific artifact types must occur at some sites and not at others. These differences should correlate with site function. This section attempts to identify which artifact types, if any, are associated with specific site types in the Big Bottoms.

All Late Woodland sites, regardless of size, have a basic ceramic inventory that includes Baytown Plain and Mulberry Creek Cordmarked. Large sites (>1 ha) more often have pans, incised, and red-filmed ceramics in their assemblages. All sites also have evidence of a basic core-debitage tool production trajectory. In fact, no specific lithic tool type is found at only a single site type.

All James Bayou-Dorena phase sites have a basic ceramic inventory of Mississippi and Bell Plain, and the finer paste varieties of Baytown Plain and Mulberry Creek Cordmarked. Old Town Red, Kimmswick Fabric Impressed, and Wickliffe Thick are included as part of the ceramic assemblages, although when present these types are found at both large and small sites. The lithic tool inventories are similar to those at Late Woodland sites.

Too few sites are present during the Medley phase to adequately generalize the presence of specific ceramic and lithic types across site types. Given the sample, though, it appears that decorated sherds such as O'Byam Incised and Matthews Incised are present at all sites. Other decorated types, including Barton Incised, Campbell Applique, Vernon Paul Applique, and Mound Place Incised, are more often present, but not restricted to, villages and towns. The lithic assemblages are similar to those of earlier periods.

This short discussion of qualitative trends in the ceramic and lithic assemblages indicates that all sites can have a particular artifact type in their inventory, although particular smaller sites had fewer types. Or, stated another way, large sites more often have all of the possible types than do small sites. Based on these data, no specialized sites existed in the Big Bottoms, and all sites had to engage in similar activities. These activities would have included agricultural pursuits, craft production, and regular maintenance activities.

Discussion

The analysis has not identified differences in material culture between sites as would be expected if the settlement system in the Big Bottoms was hierarchically organized. Similar patterns were obtained from all three locational analyses of material culture. Ceramics during the Late Woodland period and James Bayou-Dorena phase are more diverse at larger than smaller sites. For the lithics, both large and small sites had a similar diversity of lithic tools. These patterns change during the Medley phase. Both ceramics and lithics form asymptotic plots. Qualitative data analysis also does not suggest great differences between artifact assemblages of site types at any time period in the Big Bottoms. No specialized sites have been identified in the analyses presented here. The inhabitants at each site type regardless of time period required a basic ceramic and lithic inventory.

Based on these patterns, populations at all settlements, regardless of site size, would have had access to and used a basic ceramic and lithic assemblage. Functionally, the tools and ceramics would have been used to produce foods and material goods for maintenance activities and storage. The differences among sites may be primarily due to population size differences and only secondarily to the leadership roles of certain individuals. The nature of the settlement hierarchy on the Big Bottoms appears not to be based on site specialization and strong internal social divisions.

Trends in Settlement Systems on the Big Bottoms

Models of Mississippian and chiefdom societies have emphasized the presence of hierarchical social relationships and most incorporate the notion of a dualistic economy (Frankenstein and Rowlands 1978; Peebles and Kus 1977; Wright 1977). Models of dual economies generally assume the presence of a domestic sector involving most of the population, which produce food and goods for the maintenance of the family unit and surplus to subsidize an elite sector. The elite obtain this social surplus through tribute, either in the form of food, goods, or labor. Tribute fuels the prestige sector, which distributes surplus for maintenance of the elite, providing them access to sumptuary goods, a way of controlling lesser elite, and access to extra-regional relations through trade.

Contrasted with these models of Mississippian economics is Muller (1978, 1986) who suggests that Mississippian settlements represent highly redundant activity sets, with few if any members not involved in basic productive tasks.

Specialized sites and tasks are not present. Settlement hierarchies in this sense are misleading, and are due to population differences, not social or productive differences.

The data and analyses presented here, at least for the pre-A.D. 1200 period, are more in keeping with this latter view of Mississippian society. Artifact assemblages are highly redundant across site types, with site size being positively correlated with ceramic diversity. Particular differences between assemblages may be based more on differences in population size between the two sites. Indeed, the settlement system appears to rest on a two-level hierarchy.

CONCLUSIONS

The Big Bottoms survey of 1986 was successful in many respects. A large part of the northern portion of the Reelfoot Lake Basin was surveyed, including many different landforms. As a result, the site inventory for that portion of Fulton County almost doubled. The results of the survey, when combined with previous research, are useful in delineating trends in settlement patterns, culture history, and the nature of processes of settlement change.

The small number of Archaic, Early Woodland, and Middle Woodland components in the Bottoms, previously inferred by the ad hoc coverage of the area, appears to be confirmed. The reasons for this may be taphonomic (all sites dating to these periods are buried or destroyed), the floodplain may not have been heavily utilized, or archaeological markers of these periods may be too poorly defined to allow for the identification of these components.

By the Late Woodland period, the number of identified sites increases dramatically. This could be due to three factors; greater archaeological visibility of period markers, the long time span involved, or an increase in the population inhabiting the Bottoms. The last factor may be associated with an incipient horticultural economy (Kreisa 1988; Woodard 1988), which occupied land more amenable to crop production. Two site types can be identified at this time, farmsteads (<1 ha) and villages (>1 ha and ranging to 16 ha), sometimes associated with mounds. A simple, two-tiered hierarchy is present, with sites clustered into neighborhoods based on the constraints of a floodplain environment. Each neighborhood included 1-2 villages and numerous farmsteads.

A large number of sites also date to the James Bayou-Dorena phases. Differences in the site types are based not only on size, but on the presence of mounds and assemblage

diversity, although no specific artifacts are associated with a particular site type. Also occurring during the early portion of the Mississippi period was an increase in the total site area occupied. Similarly, the best evidence available at this point would suggest the continuation of a two-level hierarchical settlement structure.

Few data are available with which to make confident statements about settlement trends in the Big Bottoms during the late portion of the Mississippi period. A few trends, though, are evident. A new site type, the town, as represented by Sassafras Ridge was incorporated into the settlement system by at least A.D. 1200. Coupled with this is an increase in total site area occupied on the Bottoms over previous time periods. This increase may be even greater than estimated at present, since it is likely that many small Medley phase sites have not been identified.

The late prehistoric culture history of the Big Bottoms is suggestive of an increasingly complex Late Woodland-Mississippi period settlement system. Qualitative data suggest that all sites, regardless of size or the presence of mounds, have a broadly similar material assemblage. Populations at all sites had the need and ability to produce their own subsistence base and performed maintenance activities. Differences between sites are chiefly due to the presence or absence of a mound and plaza complex, and apparently do not extend to mundane village activities. Muller (1986) has suggested that many Mississippian societies were in fact organized in this manner, and not in a rigid social hierarchy as has often been suggested in the past.

This settlement pattern analysis of the Big Bottoms is a first step in understanding the nature of Late Woodland-Mississippi period social organization in the Big Bottoms. Many of the speculations made here should be tested by intensive excavations of the different site types. But, the current analysis reinforces Butler's (1977) claim that only when regions are intensively surveyed can changes in socio-political structures be identified. Continued investigation in the Bottoms will clarify many of the issues raised here.

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