To the Graduate School:

I am submitting herewith a dissertation written by Roland Parker Stephen Davis, Jr. entitled "Stability and Change in Aboriginal Settlement within the Lower Little Tennessee River Valley." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Anthropology.

Gerald F. Schroedl, Major Professor

We have read this dissertation and recommend its acceptance:

Accepted for the Council:

Vice Provost
and Dean of The Graduate School

STABILITY AND CHANGE IN ABORIGINAL SETTLEMENT WITHIN THE LOWER LITTLE TENNESSEE RIVER VALLEY

A Dissertation

Presented for the

Doctor of Philosophy

Degree

The University of Tennessee, Knoxville

Roland Parker Stephen Davis, Jr.

June 1986

ACKNOWLEDGMENTS

The following study is based upon archaeological research undertaken within the Tellico Reservoir over the last three decades. This research was conducted by The University of Tennessee, Department of Anthropology under the overall direction of Drs. Alfred K. Guthe, Jefferson Chapman, and Gerald F. Schroedl, and was sponsored by the Tennessee Valley Authority, National Park Service, and National Geographic Society. To the many individuals who were involved with the retrieval, analysis, and interpretation of archaeological remains recovered by the Tellico Archaeological Project, I owe my deepest gratitude.

Several persons deserve specific recognition for their contributions to this study. First, I would like to thank my doctoral committee: Dr. Gerald F. Schroedl (Chairman), Dr. Charles H. Faulkner, Dr. Jefferson Chapman, Dr. Richard Jantz, and Dr. Gipsie Ranney (Department of Statistics). Their many helpful comments and criticisms contributed substantially to the quality of this dissertation. I would especially like to express my gratitude to Gerald for his role as my teacher and mentor and to Jeff for providing me with the opportunity and support to conduct the archaeological research reported herein. Both have been good friends for many years and have been instrumental in my development as an archaeologist.

Systematic regional investigations within Tellico Reservoir, directed toward understanding past settlement systems, began in 1979 with the initiation of the Tellico Probabilistic Survey and were completed in 1982. The success of this survey project, which formed

the basis for the land use study presented in Chapter V, was due in large measure to the efforts of Mr. Larry R. Kimball and Mr. William W. Baden. In addition to directing the analysis of lithic artifacts recovered by the survey, Larry was instrumental in the development of the overall research design and provided a constant stream of insightful advise and constructive criticism. Bill was equally valued for his computer and mathematical skills. My graduate experience at The University of Tennessee was greatly enhanced by my association and interaction with these two colleagues.

Several other individuals who contributed to the success of the Tellico Probabilistic Survey and who also deserve a word of thanks include Dr. William M. Bass, Head of the Department of Anthropology, Dr. Paul W. Parmalee, Director of McClung Museum, and Messrs. J. Bennett Graham and Maxwell D. Ramsey of the Tennessee Valley Authority. Students who supervised the fieldwork phase of the survey, analyzed the recovered artifacts, and entered the resulting data onto computer files included Marla Baden, Nancy Bell, Cliff Boyd, Donna Boyd, Neal Brun, Dave McMahan, Richard Ramsey, Sandra Raredon, Brett Riggs, Don Spires, Steve Webb, and Tom Whyte. Their hard work made the survey project a success. Neal Brun also drafted the figures in Chapters III, IV, and V, and in Appendix 1.

I would also like to thank Dr. Roy S. Dickens, Jr., Director of the Research Laboratories of Anthropology, University of North Carolina, Chapel Hill, for his support of my research during the past three years and for allowing me to use the superb facilities at the Research Labs.

Analyses and text editing were performed at The University of Tennessee Computer Center, the University of North Carolina Computation Center, the Triangle Universities Computation Center, and the microcomputer laboratory of the Research Laboratories of Anthropology.

Finally, I wish to thank my wife Brenda for her constant love and encouragement. It is not always easy to be married to a graduate student!

ABSTRACT

Aboriginal settlement systems within the lower Little Tennessee River valley in southeast Tennessee are studied through analyses of archaeological data regarding regional land use patterns, the spatial distributions of settlements, and intrasite structure. These data derive from intensive archaeological survey, regional probabilistic sampling, and excavation, conducted by The University of Tennessee between 1967 and 1981. Analyses of settlement data, representing over 12,000 years of occupation, are preceded by the definition of a settlement typology, an evaluation of the spatial structure of environmental resources, and the development of chronological models of artifact variability for recognizing temporally specific site occupations. Regional land use patterns are defined through the spatial analysis of artifacts, employing a "non-site" sampling design, from a 34,000-acre survey area. This analysis indicates a clear and continuous dichotomy in land use between alluvial valley and upland landforms that is best explained in terms of residential site maintenance versus resource extraction. Settlement patterns for each of 17 recognized cultural phases and four undesignated temporal units, dating from the Paleo-Indian to Historic period, are defined from a sample of 624 archaeological sites. These patterns are derived from site distribution data and syntheses of available information about intrasite structure and content. Evaluation of similarities and differences between phase-specific settlement patterns indicate four major diachronic trends: 1) the fluctuation of settlement intensity and distribution during the Archaic period, reflecting shifts in

annual territories or ranges; 2) gradual population expansion and increased size differentiation among residential sites during the Late Archaic and Woodland periods; 3) rapid population growth, population consolidation within nucleated settlements, and the development of settlement hierarchies during the Mississippian period; and 4) settlement dispersion and eventual abandonment of the lower Little Tennessee River valley during the Historic period.

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CHAPTER I

INTRODUCTION

Archaeological investigations within the Tellico Reservoir, situated along the lower Little Tennessee and Tellico rivers in southeast Tennessee, were undertaken by The University of Tennessee, Department of Anthropology between 1967 and 1981, under contract with the Tennessee Valley Authority and the National Park Service (Figure 1). These investigations recorded 624 aboriginal sites and documented a 12,000-year period of aboriginal occupation dating from the early Holocene through the eighteenth and early nineteenth centuries.

Twenty-six sites were excavated and have allowed the establishment of a regional chronology as well as the study of prehistoric lifeways (see Baden 1983; Chapman 1973, 1975, 1977, 1978, 1979, 1980, 1981, 1982; Chapman and Newman 1979; Cridlebaugh 1977, 1981; Gleeson 1970, 1971; Guthe and Bistline 1981; Polhemus 1978, 1983; Russ and Chapman 1984; Salo 1969; Schroedl 1975, 1978b, 1982; Schroedl et al. 1985). An additional 30 sites were subjected to more limited test excavation to obtain artifact samples and evaluate future archaeological research potential (Chapman 1974, 1980; Davis 1980b; Davis et al. 1982; Gleeson 1970, 1971; Salo 1969). The majority of recorded sites, however, are known only from data obtained by archaeological survey. While early surveys (1967-1970) were directed toward discovering sites suitable for excavation, three area-wide, problem-specific archaeological surveys also were conducted in order to: 1) record and sample deeply buried sites along the first alluvial terrace

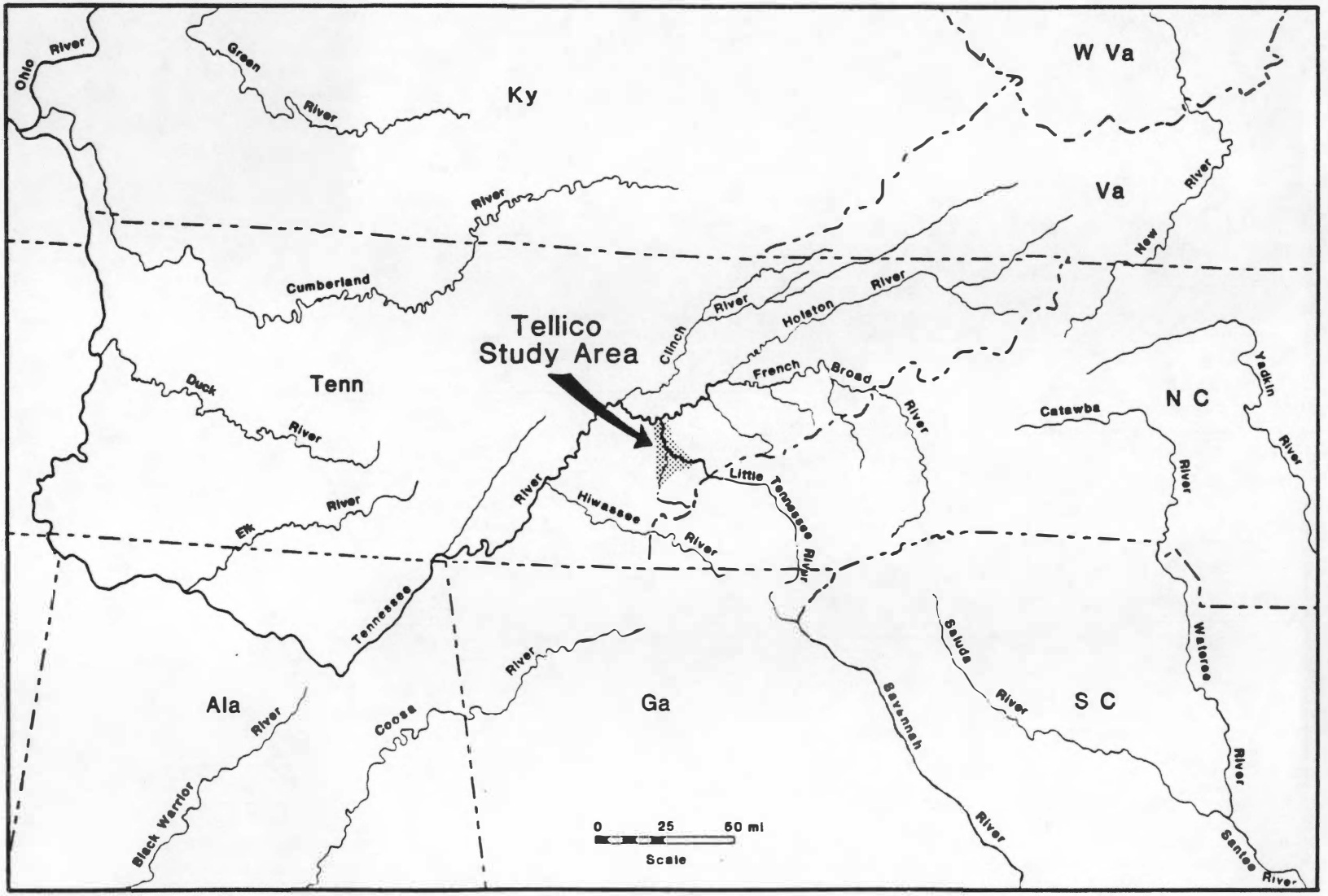


Figure 1. Map of the interior Southeast showing the location of the Tellico study area.

of the Little Tennessee River (Chapman 1978); 2) expand and evaluate the adequacy of the existing site inventory for the "below pool" or impoundment zone of Tellico Reservoir (Kimball 1985); and 3) obtain a systematic set of survey data from both valley (below pool) and upland (above pool) zones that could be used to study aboriginal land use patterns (Davis 1980a, 1980b; Davis et al. 1982).

In addition to identifying the valley's archaeological wealth and documenting both a lengthy and continuous sequence of human activity, the site data resulting from these investigations comprise a sizable and moderately comprehensive set of information for studying aboriginal settlement systems.

PREVIOUS SETTLEMENT RESEARCH

Despite extensive research into the aboriginal occupation of the lower Little Tennessee River valley, knowledge about the prehistoric settlement systems and their evolution through time is limited. With the exception of recent analyses of broad, prehistoric land use patterns using probability-based survey data (Baden 1985; Davis 1980a, 1982, 1985; Davis et al. 1982; Kimball and Baden 1980), previous settlement studies have been limited to analyses of intrasite patterning and structure (e.g., Kimball 1981; Schroedl 1980) and intersite patterning based solely upon excavated site data (e.g., Chapman 1976; Polhemus 1975). These land use studies were largely directed toward developing predictive locational models and did not utilize extant settlement data from previous archaeological investigations within the study area.

The initial study of the probabilistic survey data considered surface collected artifacts from individual sampling units as single site assemblages and attempted to delimit regional land use patterns from spatial variability among these artifact assemblages (Davis et al. 1982). This analysis involved the development of a functional site typology and subsequent classification of artifact assemblages, evaluation of associations between site types and certain environmental variables, and a general assessment of diachronic trends. It was concluded that the survey data reflected a regional pattern of aboriginal land use that involved differential exploitation of valley and upland life zones and persisted from Archaic to Mississippian times. Residential activities were concentrated along major rivers and tributary streams while the uplands experienced activities associated largely with resource extraction.

Although this study was successful in modeling the general configuration of aboriginal settlement within the study area and provided useful information for future management of archaeological resources by the Tennessee Valley Authority, it was largely inadequate for detecting more specific settlement patterns. The consideration of surface collections as assemblages permitted only a gross characterization of a site's function based upon the cumulative effect of all site occupations. In addition, too few temporally diagnostic artifacts were found to allow for the detection of chronological patterns beyond general differences between Archaic/Early Woodland and Middle Woodland/Mississippian occupations. Lastly, because only a small number of sampling units were collected from the alluvial

terraces of the Little Tennessee and Tellico rivers prior to reservoir inundation, the survey data were largely insufficient for assessing details of residential site patterns.

A second and more recent study by Baden (1985) focused upon diachronic trends in settlement variability within the study area. This study, involving the statistical manipulation of topographic variables and the spatial mapping of significant site density increases between five time periods, concluded that: 1) site density increased along major river valleys during the Archaic and Early Woodland periods; 2) intensive site use shifted to the mouths of primary streams during the Middle Woodland period; and 3) the Mississippian settlement pattern could be characterized by extensive expansion onto cultivatable soils. Two potentially serious problems are seen with this study. First, the mathematical modeling of topography, based upon elevation measures and measures of distance from major streams, does not sufficiently differentiate among major landform types. In particular, portions of upland landforms near the Little Tennessee and Tellico rivers tended to be characterized more as alluvial landforms, thus masking the marked discontinuity in site distribution between valley and upland (see Davis et al. 1982). Second, by not considering functional variability among sites, the resulting patterns of site density increases cannot be fully explained.

STATEMENT OF PROBLEM AND SIGNIFICANCE

The problems addressed by this study are the definition of aboriginal settlement systems and the explication of settlement change and stability within the lower Little Tennessee River valley. Specifically, research was focused upon the development of a series of settlement models for the entire period of aboriginal occupation (ca. 11,000 B.C. - A.D. 1838). Twenty-one separate temporal units are presently recognized within Tellico Reservoir (Kimball 1985:451-452) and were used to define temporally discrete units of analysis. Individual settlement models were constructed empirically using a combined database incorporating probabilistic survey, nonprobabilistic survey, and excavated site data. Explanation of settlement systems was based upon the functional differentiation of sites and an analysis of their environmental contexts. Settlement systems were then examined chronologically to identify patterns of continuity and change. Recognizable patterns were evaluated with respect to general theories about adaptation and cultural evolution within the Southeast and considered diachronic change as a possible response to evolving subsistence technologies, increased social complexity, and alteration of the biophysical environment.

The anthropological significance of this study is threefold. First, it provides a synthesis of available archaeological data from the lower Little Tennessee River valley, focusing upon one aspect of aboriginal lifeways--settlement systems. An analysis of settlement systems is essential to integrating the vast array of site-specific information presently available for the study area. Archaeological

settlement research is particularly appropriate since extensive archaeological investigations of the valley are now completed.

Second, the study is significant because it provides a framework for interpreting archaeological site distributions elsewhere within the southern Ridge and Valley province. Other settlement studies presently available for this area are few (e.g., Lewis and Kneberg 1946; McCollough and Faulkner 1973). Regionally, the study is relevant to understanding prehistoric adaptations within other tributary valleys of the Tennessee River system such as the Hiwassee, Little, and Little Pigeon river valleys.

Finally, results of the study add to an ever-increasing body of settlement data for the interior Southeast (e.g., Bass 1977; Bowen 1977; Dye 1977; Faulkner 1973; Faulkner and McCollough 1973; Jenkins 1974; McCollough and Faulkner 1973; Walthall 1980) and thus contribute to future studies of regional adaptation and culture process.

DESCRIPTION OF RESEARCH

The study of settlement systems can be approached from at least two perspectives. Traditionally, settlement studies have been concerned largely with the location and interrelationship of places or sites where people resided (Chang 1972; Trigger 1967; Willey 1953). Such studies have attempted to define patterning among residential sites thought to have been occupied either simultaneously or sequentially within a seasonal round.

At least a few relatively recent studies of hunter-gatherers have examined settlement systems from a more generalized perspective,

emphasizing spatial differences in land use related to residential site maintenance and resource extraction activities (e.g., Bettinger 1977; Thomas 1972, 1973). These studies have sought to understand man's interaction with his environment rather than simply his place within it. Within the Southeast, traditional methods of site survey and evaluation have resulted in a general failure to detect resource extraction activities (excepting quarry locations) since such sites are typically characterized by extremely low artifact density and usually lack subsurface integrity. As a consequence, there has been no empirical basis within this region for evaluating land use patterns.

These two settlement perspectives can be considered hierarchical and, in fact, complement one another. Land use studies provide a basis for evaluating broad adaptive patterns while studies of residential site patterning attempt to explain a single aspect of adaptation--namely, the spatial structuring of places of habitation within the context of social, technological, and environmental constraints. Extant archaeological data from Tellico Reservoir are sufficient to study both land use and residential site patterning.

Research of settlement patterns within the lower Little Tennessee River valley was undertaken in two stages. Stage 1 consisted of an analysis of general land use patterns, focusing upon differences between valley and upland site utilization. Previous analysis of surface samples from probabilistic survey had suggested that substantial dissimilarities in aboriginal land use existed between these two environmental zones (Davis 1982). During Stage 1 research,

probabilistic survey data were reanalyzed to define the spatial distributions of individual artifact classes (e.g., tool and debitage classes) and to draw inferences about the spatial structure of underlying land use activities. Evaluation of temporal differences in artifact distributions was undertaken to assess broad patterns of diachronic change in aboriginal land use. For this analysis, time was divided into two general periods--Early (Early Archaic through Early Woodland) and Late (Middle Woodland through Historic). Gross temporal recognition was considered useful since: 1) these two temporal units generally coincide with major stages in the evolution of subsistence economies (i.e., hunting and gathering versus intensive horticulture and maize agriculture); and 2) it permitted the use of most artifact samples from probabilistic survey which failed to produce temporally diagnostic artifacts (see Kimball 1982). Functional interpretation of artifact classes followed earlier models devised for artifact assemblage studies in Tellico Reservoir (Davis 1985; Davis et al. 1982; Kimball 1981; Kimball and Baden 1980), and provided a basis for determining activities represented within specific artifact samples. Spatial distributions of artifacts were articulated with spatial patterns of biophysical resource availability and considered differences in artifact occurrence in terms of site maintenance and resource extraction activities (Binford and Binford 1966).

All fieldwork and artifact classification necessary for Stage 1 research was completed during the Tellico Probabilistic Survey Project (see Davis et al. 1982). Sixty-two percent (n=262) of the 425 sampling units surveyed produced approximately 66,000 aboriginal

artifacts. The spatial analysis of individual artifact classes was not undertaken as part of the original project. Instead, artifacts from individual sampling units were treated collectively as assemblages. The present analysis reevaluates land use patterns from a truly "non-site" perspective, examining artifact rather than site distributions (see Dunnell and Dancey 1983; Thomas 1975).

Stage 2 research consisted of an analysis of all available site data from the study area to evaluate temporally specific settlement patterns. These data represent 624 aboriginal archaeological sites sampled by probabilistic surface reconnaissance, nonprobabilistic surface reconnaissance, deep testing for buried sites, and archaeological excavation. Most artifact samples from surface collections and testing (where available) have been analyzed using generally compatible artifact classification systems (see Davis et al. 1982; Kimball 1985). Several excavated site samples were analyzed differently but are still comparable at an acceptable level of generalization (e.g., necessary to recognize specific temporal periods of occupation and general site function). In short, the artifact data employed in Stage 2 research consisted of existing published and unpublished artifact inventories.

During Stage 2 research, sites were classified temporally following a framework proposed by Kimball (1985) and employed by the Tellico Probabilistic Survey (Davis et al. 1982). This framework defined one Paleo-Indian, 13 Archaic, three Woodland, and four Mississippian temporal units. Functional variability among sites was analyzed separately for each time period. Artifact content, as well

as other site attributes such as site size (when known), general artifact density, and the presence of other non-artifactual remains (e.g., features, structures), were examined. Translation of functional variability into a settlement typology was based on general models of cultural adaptation in the Southeast and empirical data from excavated sites within the study area. For example, the analysis sought to recognize settlement types such as base camps and temporary hunting camps (field camps to use Binford's (1980) terminology) within Archaic site samples and site types reflecting more complex settlement structure (e.g., homesteads, hamlets, centers) for Mississippian period samples. Temporally specific site samples were analyzed spatially and within their environmental context to define individual settlement patterns and to interpret the settlement systems (i.e., the set of rules which generate a particular pattern [Flannery 1976:161-162]) which underlie them. Settlement systems were then studied sequentially to elucidate systemic change through time.

LIMITATIONS

Three factors limit the precision by which settlement systems can be modeled using available archaeological data from the lower Little Tennessee River valley. First, the study universe represented by the extant archaeological database coincides with TVA's Tellico Project boundary; consequently, it does not constitute a naturally or culturally bounded spatial unit and may not contain all elements of settlement systems based in the lower Little Tennessee River valley. It is likely that settlement systems during some time periods were

characterized by activities that extended well beyond the study area. Furthermore, even though a sizable portion of uplands was sampled adjacent to Tellico Reservoir, dissimilar land uses may have existed beyond those areas. In short, the direct applicability of the analysis results to areas peripheral to the study area cannot be demonstrated.

Second, the extant archaeological database for Tellico Reservoir is of variable quality because numerous investigators were involved with the project and because procedures of archaeological sampling and record-keeping evolved considerably during the 15-year history of the Tellico Archaeological Project. Since much of the study area (including the entire area of site-intensive excavation) is no longer accessible due to reservoir impoundment, there is no possibility of improving the database with additional samples. Therefore, only a moderately low-level analysis of settlement systems is possible. Site-specific information regarding community plan and intrasite activity structure is available only for a few sites. As a result, most conclusions about site function are based largely upon artifact content. Since most artifact samples from sites recorded in the study area represent mixed assemblages from two or more occupations, conclusions about site function for a particular occupation are necessarily general.

Third, because a majority of the sites (and all probabilistic survey samples) were defined from surface collections, direct subsistence and seasonality data are not available. Interpretations of subsistence therefore must rely upon previous studies of excavated

site data (e.g., Bogan 1980; Chapman and Shea 1981). Direct subsistence data are wholly lacking at upland sites.

Despite these limitations, the Tellico archaeological database is of sufficient size and quality for a generalized analysis of settlement systems, and therefore provides a basis for gaining insight into changing lifeways during the course of aboriginal occupation within the study area.

CHAPTER II

MODELS OF CULTURAL ADAPTATION AND SETTLEMENT TYPOLOGIES

Archaeological settlement patterns can be analyzed at three levels. These include: 1) the formal-functional characteristics of individual dwellings or other architectural features; 2) a site's internal structure or community plan; and 3) the structural and intersite relationships among settlements at the regional level (Clarke 1977; Dickens 1978; Trigger 1967). This study is concerned primarily with settlement patterning at the regional level and the systems which underlie that patterning.

The investigation of regional settlement systems from an archaeological perspective occurs at four sequential stages, beginning with the generation of an undifferentiated inventory of spatially recorded sites, artifacts, or artifact clusters, and culminating with an informed interpretation of the functional variability which they exhibit and the cultural reasons for their particular spatial configuration (Figure 2). The first stage involves the actual collection of relevant data, usually an inventory of sites generated by some type of regional-scale survey. Although a probability-based survey design is usually most desirable (Binford 1964), other forms of survey which are either comprehensive or exhaustive may produce equally informative site inventories.

Analysis begins with temporal recognition--that is, the identification of synchronous sites which comprise the site pattern of a particular archaeologically defined culture. Temporal recognition,

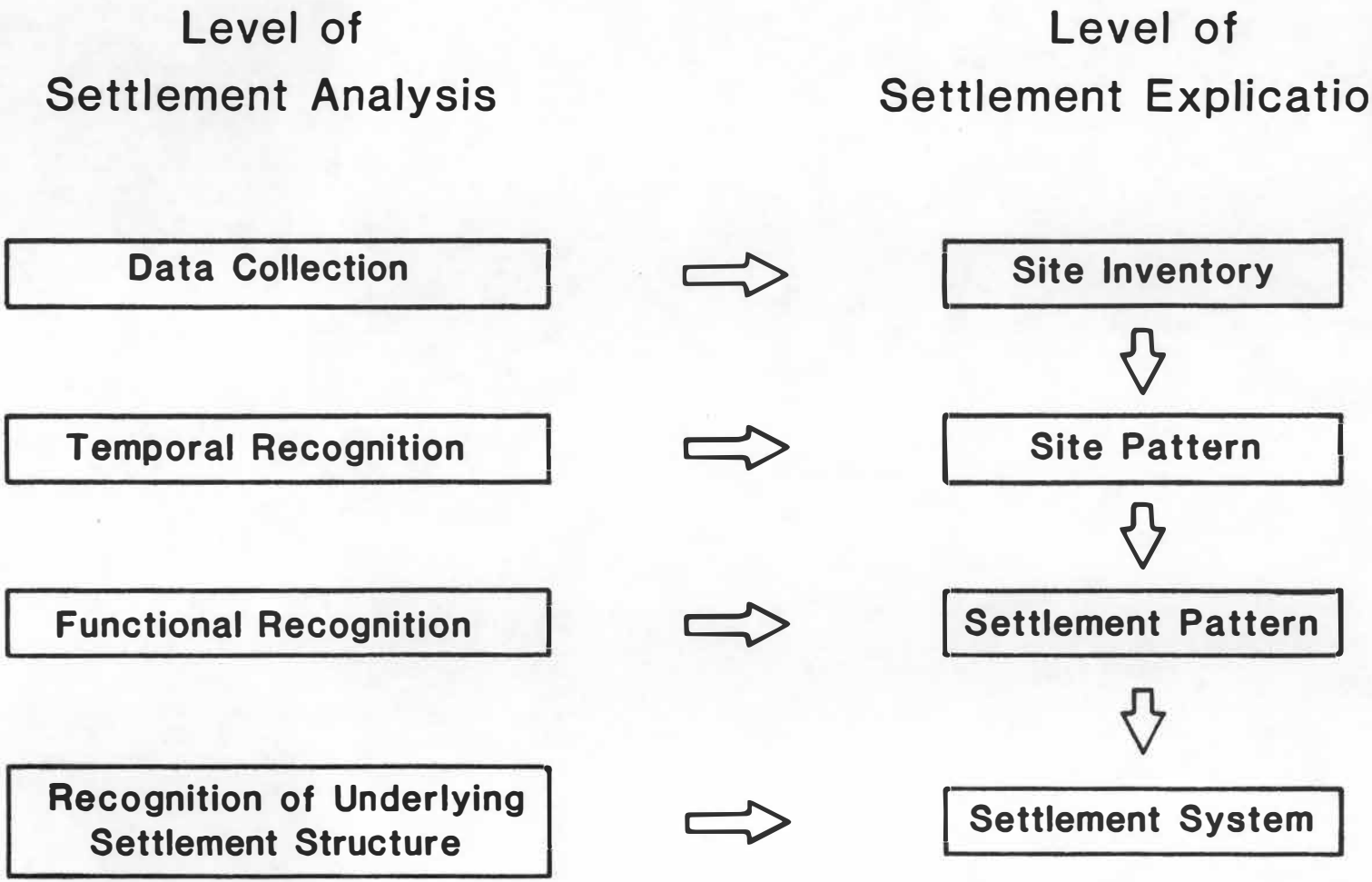


Figure 2. Schematic diagram relating levels of settlement analysis and settlement explication.

normally based on temporally diagnostic artifacts or "time markers," is a necessary prerequisite to any detailed study of archaeological settlement since it determines which sites are a product of the same cultural system. Synchronism usually can be defined only in a relative sense (e.g., within broad segments of time); consequently, it is seldom possible to determine if two or more sites were occupied simultaneously.

The third stage of study involves the recognition of functional variability inherent in the range of sites represented for a particular archaeological culture, based on site content and location, and the construction of a suitable typological framework to account for such variability. The placement of functionally differentiated sites within a spatio-environmental context comprises an archaeologically defined settlement pattern. While the definition of settlement pattern does not require the identification and functional interpretation of all possible sites, it does require the consideration of a sample of sites obtained in such a way that all possible locations and functions have an opportunity to be observed. Ideally, the settlement pattern should encompass the entire region occupied or exploited by a particular culture; however, this is seldom achieved by regional survey due to the practical constraints of archaeological survey and an inability to establish precise boundaries for extractive behavior (i.e., home range or territory).

The final stage of analysis involves the delineation of a set of "rules" which explain the settlement pattern in terms of economic, social, or political systems. These rules define the settlement

system and can be expressed as general probabilistic statements about the spatial distribution and function of sites comprising a settlement pattern (see Flannery 1976:162-163). In this sense, the settlement system explains how sites within a settlement pattern are functionally interrelated as well as the structure which underlies their spatial distribution. Spatial structuring may exist as a networking of functionally articulated sites (i.e., site-specific structuring), or it may exist simply as a zonal response to a particular set of environmental variables.

In the remainder of this chapter, three models that have been proposed to explain cultural adaptation among aboriginal populations in the interior Southeast are examined. Conclusions resulting from this examination are used to establish relevant settlement typologies for studying settlement change and continuity within the lower Little Tennessee River valley. Two separate typologies--Collector and Agricultural—are proposed with each being applicable to a particular level of economic and social development.

MODELS OF CULTURAL ADAPTATION

During the fifty years since intensive archaeological research first began in the Southeast, a variety of models have been presented to describe the region's culture history. Most have sought to define spatio-temporal frameworks for organizing extant archaeological data on a regional scale (e.g., Ford and Willey 1941; Griffin 1946, 1967; Sears 1964; Dragoo 1976; Stoltman 1978). At least three studies (Willey and Phillips 1958; Caldwell 1958, 1971; Cleland 1966, 1976),

however, have sought instead to explain the processes of cultural evolution and adaptation which operated throughout Southeastern prehistory. These three studies reflect major schools of thought regarding culture development within the larger Eastern Woodlands culture area (Kroeber 1939). Each has played a significant role in shaping contemporary ideas and expectations about cultural adaptation and associated settlement systems. Two of these studies (Willey and Phillips 1958; Caldwell 1958) focus upon the implications of culture development in "nuclear" centers where civilizations arose (e.g., Mesoamerica) to other marginal or "non-nuclear" areas (e.g., North America), while the third study (Cleland 1976) models cultural development within the Eastern Woodlands from an economic perspective (Table 1).

Historical-Developmental Model

In 1958, Gordon Willey and Philip Phillips presented a synthesis of New World prehistory incorporating five broad stages of cultural development which they considered relevant to regions such as Mesoamerica and Peru-Bolivia where nuclear civilizations ultimately arose as well as "non-nuclear" areas including the Southeastern United States. They termed their approach "historical-developmental interpretation" and regarded it as a descriptive summary of prehistory rather than an attempt to explain historical developments. Despite this, the historical-developmental model did make a significant theoretical contribution to Southeastern archaeology by proposing qualitative similarity in cultural development between Mesoamerica and the Southeast prior to the rise of urban centers in the former region.

Table 1. Summary of cultural adaptation models.

Period[1]	Dates	Willey & Phillips 1958	Caldwell 1958	Cleland 1976
Mississippian	AD 900 - Contact	Formative Stage	Increased "Nuclear" Connections	Late Focal
Late Woodland	AD 600 - AD 900	"	Development of Regional Traditions	"
Middle Woodland	200 BC - AD 600	"	"	Late Diffuse
Early Woodland	1000 BC - 200 BC	"	"	"
Late Archaic	4000 BC - 1000 BC	Archaic Stage	Establishment of Primary Forest Efficiency	"
Middle Archaic	6000 BC - 4000 BC	"	"	Early Diffuse
Early Archaic	8000 BC - 6000 BC	"	"	Early Focal
Paleo-Indian	? - 8000 BC	Lithic Stage	Paleo-Indian	"

[1]Based on Griffin (1967).

The crux of their position was that aboriginal cultures within the Southeast, once stable agriculturally based economies had become established, were essentially pre-adapted to urbanism.

The five stages of historical development recognized by Willey and Phillips--Lithic, Archaic, Formative, Classic, and Post-classic--reflect an evolutionary relationship among hunting, hunting and gathering, agriculture, and agriculturally based urbanism. The Lithic stage was considered a hunting stage and in the Southeast was equated with Griffin's (1967) Paleo-Indian period. The subsequent Archaic stage in the Southeast was considered by Willey and Phillips (1958:107) to reflect migratory hunting and gathering cultures with progressively more gathering. The Formative stage, equated with Griffin's Middle Woodland, Late Woodland, and Mississippian periods, was defined by the "presence of agriculture or other comparably successful subsistence economy of comparable effectiveness, and by the successful integration of such an economy into well-established, sedentary village life" (Willey and Phillips 1958:146). Furthermore, Formative societies were considered "of a certain minimal complexity and stability whose population sizes and gross groupings have been made possible by specific food economies" (Willey and Phillips 1958:146). Within the Eastern Woodlands, the Formative stage began with the Middle Woodland period. The eastern Formative was considered marginal to the Mesoamerican Formative from which certain ideas diffused, with the diffusion process ultimately resulting in a "full-blown" Formative stage in the East and Southeast during the Mississippian period, embracing sedentary village and town

communities. Finally, the Classic and Postclassic stages represented the urbanized state-level societies that arose in Mesoamerica and South America, and therefore were not directly relevant as culture-classificatory units within Southeastern prehistory.

Two problems exist with the Willey and Phillips model. First, they failed to demonstrate evolutionary parallels between Mesoamerica and the East following the first half of the Archaic stage which would have justified the inclusion of both regions within the same developmental model. Second, assuming parallel cultural development, no clear explanation was offered as to why a "full-blown" Formative stage did not evolve independently in the East.

Primary Forest Efficiency

The concept of primary forest efficiency, proposed by Joseph Caldwell, provided for a radically different view of cultural development in the Southeast than that held by Willey and Phillips. Caldwell (1958:v) argued that the prehistory of eastern North America was "in part qualitatively different from whatever may be common to the configurations of growth in the 'nuclear civilizations' of Mesoamerica and in the Old World." While admitting various levels of culture contact between Mesoamerica and the East during later periods of eastern prehistory, Caldwell maintained that parallels in cultural development existed only at the beginning of the culture sequence. In short, he rejected the notion that the East could be subsumed within a framework specifically applicable to Mesoamerica. Caldwell considered eastern prehistory to represent a "non-nuclear" type of cultural development, stating that the development toward a "civilization"

stage (i.e., Classic stage) may be a special rather than a normal situation. According to Caldwell (1958:vi),

> We focus here not on primitive society as a typological antecedent to urban society . . . but rather on primitive culture as showing other developmental processes which might never of themselves lead to urban societies, particularly if they resulted in stable situations.

The non-nuclear character of cultural development within the East, as seen by Caldwell, reflected three diachronic patterns: 1) establishment of primary forest efficiency; 2) regional differentiation and stylistic change; and 3) increasing connections with nuclear American civilizations. The term "primary forest efficiency" was used by Caldwell to describe a perceived long and gradual adaptation to the deciduous forests of the East during the Archaic period, resulting in increased cultural homogeneity and economic stability through time. According to Caldwell (1958:18),

> during the five thousand or so years of Archaic duration ending in most regions about 2000 B.C., we find a trend toward greater hunting efficiency. With the progressive discovery of new food resources the seasonal economic cycles became established. Finally, there is evidence of an increasingly settled and materially richer life.

Primary forest efficiency, then, was seen as a process of "settling in" to a forest environment whereby sedentism was the logical outcome. In short, it provided an economic foundation for later developments.

Following the establishment of primary forest efficiency, the East underwent a period of regional differentiation and stylistic change. This coincides with Griffin's Woodland period. Although this period witnessed the development of incipient horticulture based upon both native and tropical cultigens, and the construction of massive earthworks in the Ohio valley and elsewhere, Caldwell (1958:viii-ix)

saw nothing in the archaeological record of the Woodland period that suggested technological or economic sophistication beyond that expected for highly efficient hunter-gatherers. Instead, he argued that efficient hunting and intensive collecting of certain locally abundant plant foods would have inhibited any potential shift to a more agriculturally dependent economic system.

> Our picture of the later East after the passing of the Archaic and prior to the appearance of Mississippian cultures is one of peoples who are still basically hunter-gatherers. . . . Such developments as acorn economies, perhaps the appearance of the bow and arrow, and improved fishing methods must have increased forest efficiency still further, rendering even more difficult the development of food production as a major economic basis (Caldwell 1958:ix).

Thus, in the absence of external stimuli, any trend toward intensive food production was considered unlikely by Caldwell.

The fact that socially complex cultures employing intensive maize agriculture did develop was viewed by Caldwell as solely a reflection of increased contact with nuclear civilizations in Mesoamerica. This culture contact situation led to the introduction of various cultigens as well as new religious, social, and technological ideas. These ideas were transmitted initially to "Gulf Tradition" cultures in the lower Mississippi valley where they were reformulated within a Woodland culture context. From there these ideas diffused northward up the Mississippi River and its tributaries. Because primary forest efficiency presumably would have inhibited the development of agricultural economies characteristic of the Mississippian period, Caldwell (1958:x) concluded that Mississippian cultural expansion represented actual migration rather than the diffusion of specific traits. Consequently, the similarities which Willey and Phillips saw

between the Mesoamerican Formative and Eastern Mississippian were regarded simply as the product of a donor-recipient contact situation which upset the normal evolutionary trajectory of cultural development within the Eastern Woodlands.

Caldwell's ideas about eastern prehistory have had a major impact upon most archaeologists working in the region, particularly with respect to interpretations of Archaic period subsistence. His concept of primary forest efficiency provided a plausible explanation for the apparent residential stability reflected in the Shellmound Archaic (see Claflin 1931; Webb 1946; Webb and Dejarnette 1942). However, with the development of interest in prehistoric subsistence during the mid-1960s and improved techniques for recovering and analyzing subsistence data, primary forest efficiency came under heavy criticism as being an overly simplistic model based more upon speculation than firm archaeological data (Cleland 1966; Asch et al. 1972).

Focal-Diffuse Model

An alternative interpretation and explanation of economic trends during the Archaic period has been proposed by Charles Cleland (1976). Cleland has argued that prehistoric cultural adaptations can be viewed along a continuum from highly specialized (focal) to very generalized (diffuse), and that shifts between the two ends of the continuum occurred at certain times during eastern prehistory as economic systems adjusted to external stimuli (e.g., climatic change, introduction of tropical domesticates, etc.). Focal adaptations are characterized by dependence upon a few similar resources and are both specialized and conservative, while diffuse adaptations are based on

the scheduled utilization of a great variety of dissimilar resources.

Certain archaeological consequences were identified by Cleland (1976:61-66) for each adaptive mode. Because focal adaptations are highly specialized, they tend to be characterized by: 1) limited functional variability in toolkits; 2) a well-developed storage technology to overcome seasonal rhythms; and 3) brief but intensive (and redundant) site utilization as a consequence of regularized patterns of resource extraction. Focal adaptations tend to produce a relatively high degree of cultural stability; however, change or adjustment of the economic system in the face of external pressure is often difficult because of over-specialization.

Diffuse adaptations, conversely, tend to be flexible and can readily adjust to change since they incorporate a potentially diverse array of economic orientations. This diversity is reflected archaeologically by: 1) increased variability in tool forms paralleling functional variability; 2) great technological variability among sites of a particular settlement system as a consequence of seasonally and ecologically specific resource extraction; 3) equally high variability in site size and permanence due to group mobility and resource scheduling; and 4) a tendency for sites to reflect extensive rather than intensive use.

Following his model of adaptation as a dichotomy between wide and narrow spectrum pursuits, Cleland (1976:69-72) has defined four broad patterns of adaptation during the prehistory of the eastern United States: Early Focal, Early Diffuse, Late Diffuse, and Late Focal. The Early Focal pattern coincides with Griffin's (1967) Paleo-Indian and

Early Archaic periods, and Willey and Phillips' (1958) Lithic stage. Cleland (1976:68-69) considered the Early Focal pattern to represent an adaptation centered upon hunting large gregarious herbivores of the late Pleistocene and early post-Pleistocene, and observed that tool-kits from this time period indicate limited activities related to processing meat, hides, and bone with little variability in either site size or permanence. This monolithic view of Paleo-Indian adaptation has been questioned since other non-hunting related activities are at least equally represented in Paleo-Indian tool assemblages and therefore imply a more complex and diversified adaptive response (Wilmsen 1968:38).

Cleland's (1976:69-70) Early Diffuse pattern can be equated with Griffin's Middle Archic period and was considered to represent an adaptive shift due to environmental stress as a result of the elimination of big game. A variety of new tools appeared during this period, including large wood-working and plant food processing implements, as well as a proliferation of functionally specific sites indicating resource procurement scheduling. Within the lower Little Tennessee River valley, archaeobotanical data fail to reflect significant differences between Early Archaic and Middle Archaic plant procurement strategies. Instead, they indicate the continuation of a strategy based on the collection of hickory nuts and acorns (Chapman and Shea 1981).

The Late Diffuse pattern incorporates the Late Archaic, Early Woodland, and Middle Woodland periods, and was characterized by "the firm establishment of multiple resource scheduling, as well as the

continued specialization of these diffuse adaptations" (Cleland 1976:70). Here, Cleland's interpretation differs significantly from both Willey and Phillips (1958) and Caldwell (1958). Whereas these researchers saw a trend toward increased focalization and intensification of resource procurement strategies throughout the Archaic, culminating in a sedentary lifeway during the Woodland period, Cleland argues effectively for the continuation and refinement of a diffuse adaptive strategy throughout much of the Woodland period. Although the introduction of pottery during this period presents a facade of significant culture change, subsistence orientation appears remarkably stable with the continuation of seasonal mobility and the incorporation of domesticates into a collector economy. In the interior Southeast, Woodland peoples probably were still largely hunters and gatherers.

Finally, Cleland's Late Focal pattern is signaled by the development of intensive maize agriculture at the onset of the Late Woodland and Mississippian periods. While both Willey and Phillips and Caldwell viewed the Mississippian development in the Southeast as a direct consequence of migration and population displacement, Cleland (1976:71-72) has left open the possibility for indigenous development in response to stimulus diffusion, noting that Late Diffuse economies were preadapted to intensive maize agriculture with respect to technologies and social organization related to the production, processing, and storage of plant products. At the Martin Farm site in the Tellico Reservoir, strong evidence exists for an indigenous Mississippian development at about A.D. 900 (Schroedl et al. 1985).

Focalization upon growing maize and other domesticates would have required a de-emphasis in mobility related to resource scheduling and a corresponding shift toward a settlement pattern centered around permanent, sedentary settlements.

SETTLEMENT IMPLICATIONS

Collectively, these models of prehistoric culture change in the Southeast provide a basis for postulating certain expectations about the nature of aboriginal settlement systems and land use patterns in the lower Little Tennessee River valley. First, all suggest that Paleo-Indian adaptation focused upon the hunting of large gregarious herbivores with wild plant foods playing a lesser, secondary role. This position is contrary to one taken by Wilmsen (1968). The infrequent occurrence and composition of Paleo-Indian sites within the Southeast (i.e., most are isolated projectile point finds) suggest a band level of social organization (see Service 1962, 1966) and a type of settlement pattern regarded as "restricted wandering" (Beardsley et al. 1956) or "general foraging" (Binford 1980). According to Service (1966:7),

> the band is usually a vague entity without very definite boundaries. The domestic family is often the only consistent face-to-face group, although brothers and their families may meet from time to time and sometimes hunt and forage together. The next largest group, the band itself, may take its definition merely from the fact that its members feel closely enough related that they do not intermarry. In some instances they also define themselves territorially, as inhabitants and "owners" of a foraging range.

Settlement systems consistent with a narrow spectrum hunting economy during the Paleo-Indian and possibly Early Archaic periods would have

been comprised of two general site types--residential bases or base camps and resource extraction loci (e.g., kill and butchering sites). Unfortunately, the paucity of Paleo-Indian sites prohibits much else in the way of settlement interpretation.

For the subsequent Archaic period, there is general agreement that the hunting and gathering adaptation became increasingly sophisticated over time with the development of a complex system of scheduling and residential mobility. However, less agreement exists about the nature of the Late Archaic economic system. Current archaeological evidence and interpretations tend to invalidate the conclusion that the Shellmound Archaic represents a settlement system employing base camps that were occupied year-round and at which Late Archaic peoples subsisted primarily on freshwater mussels. Parmalee and Klippel (1974) have shown that the caloric content of freshwater mussels is relatively low when compared to most other available animals and thus was probably inadequate to sustain a sedentary population. In addition, recent archaeological investigations, particularly within the Tennessee River drainage, have shown that shell middens comprise but one of several different kinds of Late Archaic sites. In some areas, including the upper Duck River valley (Faulkner and McCollough 1973) and lower Little Tennessee River valley (Chapman 1981), Archaic shell middens are absent altogether. Studies by Faulkner and McCollough (1973), Bowen (1977), and Dye (1977) all offer explanations of Late Archaic settlement-subsistence patterns in terms of residential mobility and resource scheduling within a seasonal round. Recent discussions of earlier Archaic settlement

patterns likewise emphasize the importance of mobility and scheduling for procuring varied, seasonally available food resources (Faulkner and McCollough 1973:417-419; Chapman 1975:233, 1979:82).

The concepts of scheduling and mobility permit a logistically organized procurement strategy for resolving conflicts posed by simultaneous availability of spatially segregated resources. Logistics characterize what Binford (1980) has referred to as "collector" subsistence-settlement systems. According to Binford (1980:10), such systems

> are characterized by (1) the storage of food for at least part of the year and (2) logistically organized food-procurement parties. The latter situation has direct "site" implications in that special task groups may leave a residential location and establish a field camp or station from which food-procurement operations may be planned and executed.

Consequently, greater variability among sites defining a settlement pattern can be expected with the development of a collector-based economic system (e.g., Cleland's Early Diffuse pattern). Binford (1980:10) recognizes five generalized types of sites that are generated by collector subsistence-settlement systems. The collector system centers around a base camp or residential base, from which other activities are staged and carried out. Exploitation of available resources occurs through foraging in the camp's immediate vicinity (i.e., within a foraging radius) as well as through overnight trips within a much larger site territory or logistical radius (Binford 1982:7). Temporary encampments and activity loci within the logistical radius tend to be task specific, collectively reflecting a potentially diverse range of activities. Logistical sites include field camps which serve the temporary residential needs of hunting and

collecting parties, stations or observation sites where information about game movement is collected, locations or task-specific activity loci where resource extraction occurs (e.g., kill sites, collecting sites, etc.), and caches where extracted goods and non-portable implements can be effectively stored for later retrieval or use. Because subsistence pursuits are not static over the course of a yearly seasonal cycle, a single site may be used for multiple, functionally distinct purposes.

With a trend toward greater sophistication in hunter-gatherer adaptation throughout the Archaic period and possibly through the Middle Woodland period (as reflected by Cleland's distinction between Early Diffuse and Late Diffuse patterns), increasing differentiation among logistical sites can be anticipated as well as greater residential permanence at base camps as more resource needs are met through logistical systems. In this sense, greater adaptive efficiency implies increased diversity in food resources rather than the focalization upon a limited range of resources as Caldwell (1958) argued. This interpretation is supported by archaeobotanical data for the Archaic and Woodland periods within the lower Little Tennessee River valley, with the species composition of botanical samples becoming progressively more diverse through time (Chapman and Shea 1981). Toward the end of the Archaic period, this diversity was enhanced by the addition of both tropical and local cultigens to the native diet.

There has been considerable debate about the effect of plant cultivation upon subsistence-settlement systems during the subsequent

Woodland period. While most researchers regard cultigens as a supplement to a basic hunting and gathering economy (see Caldwell 1958:19; Griffin 1967:183; Struever and Vickery 1973), a few have equated increased sedentism, mound and earthwork construction by some Woodland groups, and even Woodland ceremonialism with an agriculturally based economic system (Ford and Willey 1941:335; Sears 1971:325; Spaulding 1955:20; Willey 1966:268). This view of agriculture as a prime mover was also voiced by Willey and Phillips (1958:157-158) who argued that

> the great size of mounds, the nature and complexity of mortuary practices (suggestive of social stratification), the large and substantial houses, and the high artistic quality of some of the artifacts permit us to infer stable settlements and an effective economic base.

Investigations of Woodland period sites in the lower Little Tennessee River valley (see Chapman 1973; Cridlebaugh 1981; Schroedl 1978b) provide no compelling evidence that Woodland peoples were engaged in intensive horticulture or that they were residentially stable on a year-round basis.

The beginning of the Mississippian period in the interior Southeast (ca. A.D. 900-1000) represents a shift in subsistence-settlement systems associated with the economic focalization upon maize agriculture. Few would doubt that, for much of the Southeast, the Mississippian cultural configuration was qualitatively different from preceding Woodland cultures. While the definition of Mississippian culture has traditionally been based upon the presence of certain key traits (e.g., truncated, sub-structure pyramidal mounds and shell tempered pottery), Smith (1978) has recently offered an

alternative definition which treats Mississippian as a particular form of adaptation to a specific habitat situation and as a specific level of social organization. Smith notes that Mississippian adaptation is similar throughout the Eastern Woodlands in that it centers upon the meander-belt zones of major river valleys where linear bands of circumscribed agricultural lands exist for growing maize, beans, squash, and other native cultigens, and where biotic resources including fish, migratory fowl, deer, raccoon, turkey, and seed, nut, and fruit-bearing plant species are concentrated at unusually high densities. Such an adaptation permitted for a settlement system characterized by year-round sedentism.

In addition to their adaptive pose, Mississippian societies can be regarded as operating minimally at a ranked or chiefdom level of socio-cultural integration (Peebles and Kus 1977; Smith 1978:484). This level of social complexity, coupled with the need to maintain boundaries for support areas or territories, contributed to the development of fortified, nucleated settlements among many Mississippian groups. With respect to the general configuration of Mississippian settlement, Smith (1978:491) has suggested that many Mississippian populations can be

> generally characterized as having a settlement system consisting of dispersed farmsteads surrounding a local center, with the system representing a flexible compromise solution to the opposing pressures of optimum energy utilization and optimum social-cohesion--boundary-maintenance abilities.

One settlement implication of a chiefdom level society is that habitation sites will be of unequal size and importance to the resident population, depending upon the degree to which social,

political, and religious control is centralized. Thus, a site hierarchy can be anticipated that incorporates one or more local centers and a potential range of other habitation sites ranging from homesteads to villages. This pattern differs significantly from the earlier hunter-gatherer pattern where habitation sites (i.e., base camps) possess greater functional similarity.

Until recently, the development of Mississippian culture within the interior Southeast was thought to be solely a consequence of migration and population replacement from the central Mississippi valley (Caldwell 1958; Ford and Willey 1941; Griffin 1967; Willey and Phillips 1958). While population expansion is still a plausible mechanism for the spread of Mississippian culture throughout much of the Southeast, there is growing evidence for the diffusion of Mississippian ideas and their incorporation into indigenous Woodland cultures, resulting in what has been termed "emergent" Mississippian (Faulkner 1971, 1975; Salo 1969). With the recognition of n situ developmental sequences within the lower Little Tennessee River valley (Schroedl et al. 1985) and elsewhere (Walthall 1980:205), it is now clear that the process of Mississippian development in the Southeast was both complex and rapid. Earlier interpretation of site distributions for the Early Mississippian Martin Farm and Hiwassee Island phases in Tellico Reservoir suggest that fundamental settlement changes accompanied this process, reflecting a marked change in adaptive strategy and associated criteria for residential site selection (Schroedl et al. 1985).

COLLECTOR SETTLEMENT TYPOLOGY

From the preceding discussion, two broad stages in the evolution of settlement systems can be defined for the prehistoric Southeast, each reflecting a particular type of generalized subsistence base. Although the culture-developmental sequence prior to the Mississippian period has been segmented variously as Lithic-Archaic-Formative (Willey and Phillips 1958), PaleoIndian-Archaic-Woodland (Caldwell 1958; Griffin 1967), and Early Focal-Early Diffuse-Late Diffuse (Cleland 1976), to name but a few proposed classificatory schemes (also see Ford and Willey 1941; Stoltman 1978), the general mode of subsistence throughout this period was dominated by the hunting and gathering of available natural resources. Even following the introduction of tropical cultigens during the Middle Archaic and accompanying domestication of certain native species, it seems unlikely that any pre-Mississippian subsistence system in the interior Southeast became heavily dominated by food production. Instead, available archaeological data argue for the continuation of a hunter-gatherer subsistence pattern.

One implication of this conclusion is that basic similarities in site or settlement types can be anticipated for the various Archaic and Woodland occupations of the lower Little Tennessee River valley. Thus, while significant evolutionary change in both settlement and subsistence systems can be postulated for this period (see Caldwell 1958; Cleland 1976), a single settlement typology can be employed to study that change. The typology used here corresponds closely to one developed by Binford (1980) for collector settlement systems. Three

general settlement types are proposed and are defined below (Table 2).

Base Camps

Base camps are primary residential camps from which other resource-extracting activities are centered (referred to by Binford [1980] as residential bases). Artifact assemblages generated by base camps should reflect a variety of diverse activities associated with resource processing, tool maintenance, and maintenance of the residential population. Additionally, these assemblages can be expected to contain non-portable residential site furniture such as grinding stones and cooking vessels which could be cached at the site during periods of abandonment. Depending upon the degree of camp permanence, evidence of dwellings and the accumulation of spatially structured habitation refuse (i.e., midden) can also be anticipated. In logistically organized collector systems, base-camp sites typically will contain evidence of facilities, or features, that may have been used for storage. Both site size and artifact density can be expected to vary considerably for this settlement type, depending upon the yearly length of site use, extent of site re-use on a year-to-year basis, and group size. Such sites, because of the nature and intensity of activities that they represent, should be the most archaeologically visible of sites generated by hunters and gatherers.

Logistical Camps

The logistical camp, or field camp, is defined as a "temporary operational center for a task group" (Binford 1980:10). Field camps can be anticipated only for hunter-gatherer settlement systems where

Table 2. Expected settlement types for collector and agricultural settlement systems.

System Type	Settlement Type		
	Residence	Logistical Residence	Activity-Specific Location
Collector	Base Camp	Hunting Camp	Kill Locus
		Fishing Camp	Butchering Locus
		Plant Processing Camp	Plant Harvesting Locus
			Lithic Extraction Locus
			Station
			Cache
Agricultural	Local Center	Temporary Field House	Kill Locus
	Hamlet	Hunting Camp	Butchering Locus
	Homestead	Fishing Camp	Plant Harvesting Locus
		Plant Processing Camp	Lithic Extraction Locus
			Station
			Cache

resource procurement is logistically organized so that a portion of the group's resource base is obtained by smaller, specialized task groups. Although a logistical camp may serve certain maintenance functions similar to those normally associated with a base camp (such as tool repair and processing of obtained resources), only a limited range of these activities will be simultaneously represented due to the task-specific nature of such sites. However, it should be pointed out that this limited spectrum of activities can be easily obscured by overlapping but functionally dissimilar occupations. Although artifact density at logistical camps usually will be much lower than for associated base camps, redundant site use over a long period of time may create abnormally dense artifact accumulations. Unlike base camps, logistical camp sites generally will lack features (other than hearths) or evidence of domestic structures. These camp sites can be differentiated further by the specific kinds of procurement activities associated with them. Within the lower Little Tennessee River valley, logistical camps most likely to be represented archaeologically include hunting camps, fishing camps, and nut-gathering camps.

Activity Loci

Activity loci refer to a diverse range of sites or locations where specific resource-procurement activities occurred. These include kill sites and butchering sites, as well as many locations of activities (e.g., plant-processing stations) which may or may not be represented in the archaeological record. Activity loci typically experience only limited use characterized by "low bulk" procurement where tool exhaustion and discard can be expected to be low.

Furthermore, little redundancy in site use can be anticipated which would increase artifact density over time. Given their extremely low visibility and potentially great variability in tasks represented, such manifestations can be neither reliably detected nor interpreted on a site-by-site basis. Consequently, "under low-bulk extraction or low redundancy in localization, the archaeological remains of locations may be scattered over the landscape rather than concentrated in recognizable 'sites'" (Binford 1980:9).

Two other site types (stations and caches), recognized by Binford (1980) for collector settlement systems, are included as activity loci even though they are not directly related to resource procurement. Such sites do not appear to be represented within the archaeological database for the study area.

AGRICULTURAL SETTLEMENT TYPOLOGY

A second settlement typology is proposed for studying the Mississippian period occupations (including Overhill Cherokee) of the lower Little Little Tennessee River valley. This typology follows Smith's (1978) definition of Mississippian as a particular kind of adaptation and level of socio-cultural integration, and is consistent with current interpretations of Mississippian settlement variability (Green and Munson 1978; Peebles 1978; Price 1978; Steponitis 1978), as well as with typologies proposed for Formative Mesoamerica (Flannery 1976:162; Parsons 1971:22). Differences between agriculturally based, Mississippian settlement systems and earlier collector systems include: 1) greater residential sedentism; 2) a potential for

increased residential aggregation or settlement nucleation afforded by intensive maize agriculture; and 3) the development of functional inequalities among residential settlements brought about by corresponding socio-political inequalities within a chiefdom level of social organization. The agricultural settlement typology is comprised of five general site types which are defined below. A sixth type--the regional center--is superordinate to local centers and is not represented within the study area.

Local Centers

Local centers are defined as "relatively large, often fortified settlements, located centrally to a dispersed settlement pattern of small homesteads" (Smith 1978:490). Such sites can be expected to be situated adjacent to large tracts of agriculturally productive soils and function both as centers for civic and ceremonial activities and as defended sanctuaries for the outlying population during periods of hostility with neighboring groups. Smith (1978:490), based on his study of the Powers phase, suggests that many Mississippian villages may have had a "relatively small segment of the local population living within its walls on a permanent basis"; however, this view is not supported by the archaeological evidence from large Mississippian sites within the lower Little Tennessee River valley (Chapman 1982; King et al. 1969; Polhemus 1983; Schroedl 1975).

Archaeologically, local centers can be defined as large, artifactually dense village sites with evidence of civic architecture (e.g., substructure mounds, townhouses, etc.) and having an intrasite community plan with domestic structures surrounding an open plaza

area. The site may also have been palisaded for defensive purposes. Local centers (excepting regional centers) are the most conspicuous of Mississippian period sites.

Hamlets

Hamlets are domestic settlements containing several houses and lacking civic architecture and plazas. Smith (1978:500) notes that this settlement type usually is characterized as incorporating 10-20 domestic structures. This type is postulated to represent a satellite community of a larger local center but which is economically self-supporting. It is considered functionally similar to the next settlement type, the homestead, representing simply an aggregated cluster of domestic structures. Smith (1978:500) does not recognize the hamlet as a settlement type distinct from homesteads. Its designation here allows typological consideration of size differences among non-village residential sites.

Archaeological visibility of hamlets should be substantially lower than for local centers due to both lower artifact density and smaller site size. Green and Munson (1978:310) suggest a size range for Mississippian hamlets in southeastern Indiana of .25 to 1.0 ha (0.6-2.5 acres). Criteria for classification based on surface collections include: moderate artifact density, evidence of architecture (e.g., daub, clay hearth fragments, etc.), and the presence of pottery.

Homesteads

The homestead settlement type can be characterized as the "permanent year-round settlement of one to several nuclear-extended families" (Smith 1978:500) and, as such, represents the lowest-order residential site type of the Mississippian settlement system. Criteria for classifying homesteads are similar to those described for hamlets with the primary difference being that homesteads have lower artifact densities and possess smaller site dimensions. Archaeologically, such sites are the least visible of Mississippian domestic sites and within the study area have only been rarely sampled through excavation (see Polhemus 1978; Chapman 1980).

Given that hamlets and homesteads represent functionally similar settlement types differentiated primarily by size, criteria for distinguishing between them are not clear-cut. Price (1978), in his analysis of the Powers phase settlement system in the central Mississippi valley, recognized a hamlet settlement type that was distinctly different in size from either villages or limited-activity sites (i.e., homesteads). Green and Munson (1978) use a cutoff value of .25 ha (0.6 acres) to differentiate between hamlets and farmsteads (or homesteads) with hamlets representing populations of 10-25 people and homesteads supporting 5-10 people.

Logistical Camps

Four potential kinds of logistical camps or temporary habitation sites supporting functionally specific task groups are proposed for Mississippian settlement systems. These include temporary field houses, hunting camps, fishing camps, and plant-processing camps. The

latter three site categories duplicate those defined for collector settlement systems. Field houses consist of seasonally occupied dwellings or scaffolds constructed adjacent to agricultural fields and used as observatories for frightening away birds and other animal pests prior to harvest. James Adair (1775:407) described the use of these structures for the Chickasaw, and it is probable that crop-watching was also a common practice among other Mississippian agriculturalists. Smith (1978:500) has suggested that field house sites may bear a superficial resemblance to homesteads. Such sites probably are not recognizable through surface collecting (in contrast to homesteads) because they represent limited activities that generate little archaeologically recoverable residue.

Activity Loci

Finally, the range of anticipated sites reflecting resource extraction activities can be expected to be similar to those previously described for collector settlement systems (Table 2). Activity loci normally represent "low bulk" procurement activities which (excepting lithic resource extraction) produce only a limited number of recoverable artifacts. Consequently, their archaeological visibility is at best extremely poor. Sites which should be recognizable by archaeological surface reconnaissance include kill sites, butchering sites, and lithic extraction sites.

SUMMARY

In this chapter, ideas regarding the evolution of aboriginal cultures within the Southeast were reviewed to formulate general

expectations about the nature of settlement systems during the prehistory of the lower Little Tennessee River valley. These expectations are presented as two separate, temporally specific settlement typologies.

It is suggested that, despite the magnitude of differences in material-culture inventories between Archaic and Woodland occupations, and changes in subsistence that occurred during the 6,000 years separating the Early Archaic and Middle Woodland periods, sufficient similarity in overall adaptation exists for studying the settlement systems of both cultural periods within a single settlement typology. This typology emphasizes the fundamental characteristics of Archaic and Woodland peoples within the study area as food collectors, rather than intensive food producers, who lacked a well-developed system of social stratification.

Following the Woodland period (ca. A.D. 900), subsistence economies of inhabitants within the interior Southeast, including the Tellico study area, became dominated by intensive food production. Associated with this economic shift was the development of stratified societies. Because of these changes and their specific implications for residential site patterning, a second typology is proposed for studying Mississippian period settlement systems. Unlike the Collector typology, this settlement typology anticipates the presence of functionally differentiated habitation sites.

These two typologies form the basis for organizing site data from the study area into functional categories and thus provide the means for transforming site patterns into settlement patterns.

CHAPTER III

ENVIRONMENTAL SETTING

The Tellico study area is situated along the Little Tennessee (RM 0-33.1) and Tellico (RM 0-20.5) rivers in southeast Tennessee and includes portions of Blount, Loudon, and Monroe counties. The study area encompasses approximately 34,444 acres of bottomlands and uplands, including 14,400 acres now inundated by Tellico Lake.

The Little Tennessee River flows into the Tennessee River opposite Lenoir City at the northernmost end of the study area and drains an area of 2,627 square miles, including parts of Tennessee, North Carolina, and northern Georgia. Principal tributaries within this drainage system include the Nantahala, Tuckasegee, Oconaluftee, Cheoah, and Tellico rivers. Most of this drainage area lies within the Appalachian Summit, a rugged mountainous region with steep cliffs and rock outcrops, and is comprised of swift flowing, mountain streams; however, the last 40 miles of the Little Tennessee River (prior to inundation) was a moderately slow flowing stream of variable width (i.e., 200-600 ft) with a well-developed terrace system and several large islands (Tennessee Valley Authority 1972). For the last 31 miles of its course through the Tellico study area, the Little Tennessee River bisects a series of northeast-southwest trending ridges and valleys which comprise part of the Ridge and Valley physiographic province (Thornbury 1965).

CLIMATE

The regional climate of East Tennessee is temperate continental and can be classified as humic mesothermal, characterized by a definite seasonal rhythm (Thornwaite 1948). Recorded temperature extremes for Knoxville, located about 25 miles northeast of the study area, range from -16°F in January to 104°F in July; the average length of the growing season is greater than 200 days (Tennessee Valley Authority 1972).

Precipitation is well distributed with autumn months receiving the least amount of rainfall and winter months receiving the most. Average annual precipitation recorded within the study area over a 25-year period was 58.9 inches. Flooding of the lower terraces (T-0, T-1) was most common during winter and early spring, and occurred almost annually prior to the construction of Fontana Dam in 1944 (Tennessee Valley Authority 1972).

Recent palynological investigations at Anderson Pond on the eastern Highland Rim of Tennessee (ca. 70 mi west of Tellico Reservoir) suggest that the climatic conditions described above may have been generally stable throughout most of man's known occupancy of the study area (Delcourt 1979:268-271). Specifically, while cove hardwood taxa are well represented in early Holocene (12,000-10,000 B.P.) pollen spectra and suggest cool, mesic climatic conditions, spectra from middle and late Holocene contexts (9,500 B.P. - present) are comprised largely of warm temperate taxa, indicating relatively stable arboreal flora and assumedly modern climatic conditions. Minor climatic fluctuations after 9,500 B.P. include a mid-Holocene warming

and drying trend from 8000-5000 B.P. and increased precipitation during the late Holocene (2000-200 B.P.) (Delcourt 1979:270-271). One postulated effect of increased warmth (with respect to late glacial times) and absolute precipitation during the early Holocene was a concomitant increase in the sedimentation rate for the Little Tennessee River which resulted in rapid aggradation of the floodplain (T-1) surface (Delcourt 1980:120). An implication of this climatic effect is that the first terrace was seasonally unstable and probably not well suited for winter habitation during the early and mid-Holocene. At about 3000 B.P., the Little Tennessee River abandoned the first terrace surface, incised its present channel, and established the modern floodplain (Delcourt 1980:121). This incision of a new channel probably reduced the frequency of first terrace flooding.

PHYSIOGRAPHY AND TOPOGRAPHY

The Tellico study area lies at the juncture between the Ridge and Valley and Blue Ridge physiographic provinces (Thornbury 1965:100-129). This juncture is demarcated by the Great Smoky Fault (Hardeman 1966) which crosses the Little Tennessee River valley at the base of Chilhowee Mountain (RM 31.0). Only a small portion of the study area is situated east of the Great Smoky Fault and thus within the Blue Ridge province. This physiographic province, locally termed the Unaka Mountains (Miller 1974:3), is geomorphically complex and is comprised of rugged, mountainous terrain (Elevations 2,500-6,000 ft AMSL) with steep, narrow stream valleys. All lands considered within

this province as part of the present study are situated on the alluvial terraces of the Little Tennessee River.

The remainder of the Tellico study area lies within the Ridge and Valley province and can be divided into four sections. These sections consist of northeast-southwest trending ridges and broad valleys that parallel the Blue Ridge province, and formed a basis for stratifying archaeological samples within the study area (see Chapter IV). The first section encountered west of the Great Smoky Fault, the Dissected Knobs, is bisected by the Little Tennessee River between RM 23.3 and RM 31.0. This section consists of a belt of deeply eroded knobs and rolling hills underlain by shale, sandstone, and non-cherty limestone (Hardeman 1966; also see Kimball 1985). Most of the study area lying within the Dissected Knobs is drained by Tellico River. Stream valleys are generally steep-walled with narrow alluvial terraces. Elevations range from about 800 ft AMSL within the stream valleys to over 1,400 ft AMSL along the adjacent knobs.

The Dissected Knobs are flanked on the west by the Upper Valley section, a broad valley of rolling hills and generally low relief lying between the Notchy Creek Knobs (RM 23.3) and Bat Creek-Red Knobs (RM 13.3). Elevations range from 800-950 ft AMSL. The underlying geology of this section consists of cherty and non-cherty limestone, dolomite, and shale. The development of solution cavities within the limestone and dolomite strata has produced numerous karst features including caverns, sinkholes, and underground streams. One result of the dominant karst topography within this section is a general lack of surface water outside the primary tributary valleys. These

tributaries, all of which drain more than 20 square miles, include Tellico River, Baker Creek, Island Creek, Ninemile Creek, and Notchy Creek. Secondary tributaries which flow into these streams and the Little Tennessee River are limited in areal extent, and much of the adjacent upland surfaces are entirely devoid of permanent, above-ground water resources.

The Bat Creek-Red Knobs comprise a third physiographic section within the Ridge and Valley portion of the study area and consist of a single linear feature, approximately one mile in width, which intersects the Little Tennessee River at RM 12.3-13.3. This steep, dissected ridge reaches a uniform elevation of over 1,100 ft AMSL, rising more than 200 ft above the surrounding upland surface, and would have constituted a moderate barrier to aboriginal travel within the uplands. These knobs are largely underlain by shale and, because of their steep slope, were not sampled by the probabilistic archaeological survey.

The fourth section within the Ridge and Valley physiographic province is the Lower Valley and includes the portion of the study area below Bat Creek-Red Knobs (RM 0-12.3). This section is similar to the Upper Valley section in that the underlying geology is dominated by cherty and non-cherty limestone and dolomite formations, and the topography is dominated by karst features. However, streams are more localized with only one primary tributary draining more than 20 square miles. This tributary, Fork Creek, drains the northwestern slope of Bat Creek Knobs. The remaining streams within the study area drain only the immediate valley margins of the Little Tennessee River

with the interior uplands being drained by primary tributaries that flow northward into the Tennessee River. The general topography consists of low, rolling hills that vary from 800-900 ft AMSL in elevation.

The Little Tennessee River flows through all five physiographic units and comprised the focus of aboriginal adaptation within the study area. The valley is topographically diverse, being comprised of islands, sloughs, and a well-developed alluvial terrace system. Ten alluvial terrace surfaces (T-0 to T-9) have been identified along the lower Little Tennessee River and represent over 80 ft in vertical separation (ca. 745-830 ft AMSL) at the dam axis (RM 0.4) (Delcourt 1980:115). The three most recent terrace surfaces (T-0 to T-2) occur almost continuously throughout the entire length of the study area; however, older terraces (T-3 to T-9) tend to occur only as isolated remnant surfaces along the valley margins. Whereas the active floodplain (T-0) is seldom greater than 50 ft in width, first (T-1) and second (T-2) terraces are up to 3,000 ft and 4,000 ft wide in some areas. In general, however, the first terrace is usually less than 500 ft wide. These alluvial terraces offered the aboriginal occupants of the valley a variety of possible settlement locations that were generally well drained, close to permanent water sources, and situated in close proximity to several potentially rich microenvironments.

LITHIC RESOURCES

The Tellico study area contains a variety of lithic materials that were utilized by its aboriginal inhabitants. With few

exceptions, most lithic resources necessary for manufacturing tools were locally available and probably were obtained with only a minimal amount of effort. The most important of these resources were chert, chalcedony, quartz, and quartzite.

Seven major varieties of local chert are recognized. All of these derive from dolomite formations of the Knox Group (Late Cambrian-Early Ordovician) and crop out at several locations along the lower Little Tennessee River and its tributaries (see Kimball [1982, 1985] for detailed descriptions of these and other Tellico lithic resources). The best quality cherts—Knox Black Chert and Knox Black Banded Chert--occur as small nodules and are spatially restricted to the Upper Valley Uplands, where they crop out along the Little Tennessee River from RM 19-21.5, along Tellico River from RM 2-5, and along the lower portion of Ninemile Creek. Six such outcrops were identified by Kimball during his 1977 reconnaissance of the valley (Kimball 1985). Three lesser quality varieties of tabular chert—Knox Oolitic Chert, Knox Mottled Chert, and Knox Porcellaneous Chert--occur only within the Lower Valley Uplands and have been mapped along the edge of the Little Tennessee River valley from RM 4-10. The two remaining varieties--Knox Light Gray Banded Chert and Knox Dark Gray Banded Chert--occur in nodular form and have been reported from similar localities within both the Lower Valley Uplands and Upper Valley Uplands.

Chalcedony derives from the Shady Dolomite formation (Cambrian) and has been reported from the Dissected Knobs along Tellico River, at the southernmost end of the study area. Quartz and quartzite both

occur throughout the study area as cobbles within the stream bed of the Little Tennessee River and along extremely old alluvial terraces.

Other lithic resources that occur locally either within geologic strata or as redeposited gravels derived from the Blue Ridge province to the east include: limestone, dolomite, shale, sandstone, conglomerate, siltstone, hematite, gneiss, schist, and slate. Lithic resources utilized by aboriginal inhabitants of the study area that derive from non-local sources include: a variety of cherty and non-cherty cryptocrystalline materials, chlorite schist, soapstone, mica, and greenstone. The four latter categories probably were obtained from the nearby Blue Ridge province.

SOILS

Most soils located within the study area are derived from either the residuum of Paleozoic age limestone, dolomite, shale, and sandstone strata which underly the region, or from residuum reworked as either colluvium or alluvium. Soils located on alluvial terraces of the Little Tennessee River are derived, in part, from sediments of igneous and metamorphic rock transported downstream from the Blue Ridge province (Delcourt 1980).

Alluvial soils include loams and silt loams of the Congaree, Etowah, Statler, and Transylvania series. Upland soils consist mostly of silt loams, clay loams, and cherty loams of the Cumberland, Decatur, Dewey, Fullerton, Litz, Sequoia, and Waynesboro series (Elder 1959, 1961; Hall et al. 1981).

VEGETATION

Shelford (1963:19, 37) places the lower Little Tennessee River valley at the zone of transition between an oak-chestnut forest (oak-deer-chestnut faciation) and a mixed mesophytic forest (tulip-deer-oak faciation). Braun (1950) ascribes the Ridge and Valley province of East Tennessee, including most of the study area, to her Oak-Chestnut Forest Region. Eighteenth century written accounts of abundant natural resources within the lower Little Tennessee River valley, particularly those of Lt. Henry Timberlake (Williams 1927) and John Gerard de Brahm (Williams 1928:193) who referred to the valley as an "American Canaan," attest to the presence of a rich floral environment capable of supporting a diverse faunal population. Recent forest inventories within the valley, compiled prior to the creation of Tellico Lake, recorded the presence of over 60 species of trees and woody shrubs (Tennessee Valley Authority 1972).

Three sources of data are used below to assess vegetational diversity within the study area and include: 1) studies of modern flora; 2) witness tree data from early nineteenth century government land surveys; and 3) archaeobotanical studies of carbonized plant remains from archaeological sites excavated within Tellico Reservoir.

One study of modern forest communities within the central portion of the Ridge and Valley province in East Tennessee has been undertaken which contributes useful information for characterizing forest environments within the lower Little Tennessee River valley (Martin 1971). Martin examined the relationship among forest composition, topography, and soils at 58 old-growth stands within a six-county area

encompassing the study area and provided data for associating forest communities with specific soil types. These data indicate a differential distribution of forest communities and complexes between valley and upland zones, and within the upland zone of the study area. Specifically, soils found on the lower alluvial terraces (T-0 and T-1) were almost entirely associated with hydric and mesic taxa classified as Bottomland Hardwoods while older terraces and uplands supported more mesic to xeric taxa dominated by white oak, chestnut oak, and tulip-poplar. The American chestnut, removed by blight, was probably a dominant constituent of white oak and chestnut oak forest complexes situated on dolomitic ridges and undulating upland surfaces (Martin 1971:297-300), and therefore was probably present throughout much of the upland zone. The Dissected Knobs area, because of its varied topography and soils, would have supported constituents of all major forest complexes (i.e., white oak, chestnut oak, tulip-poplar, and mixed mesophytic).

Another source of information regarding pre-settlement vegetation consists of witness tree records associated with early nineteenth century federal land surveys. The value of such records for vegetation reconstruction has been demonstrated elsewhere (Zawacki and Hausfater 1969; Delcourt 1976; King 1976). Unlike the data used in these reconstructions, the witness tree records relevant to the present study are extremely fragmentary and incomplete. These records derive from treaty boundary surveys (Houston 1819) and life estate surveys (Armstrong 1820) undertaken for Cherokee families wishing to remain in southeast Tennessee following the cession of Indian lands to

the United States government under the Treaties of 1817 and 1819. Most life estates, measuring one mile square or 640 acres, were located within an area encompassed by the Little Tennessee, Tennessee, and Hiwassee rivers (known historically as the Hiwassee District), and were surveyed by the Department of War.

Twenty-seven life estates were used to characterize vegetation patterns and are represented by 139 witness trees. Sixty-one witness trees recorded along the 46-mile length of the eastern Hiwassee District boundary comprise the remainder of the sample. This boundary line is positioned mostly along the tops of ridges within the Dissected Knobs and western edge of the Blue Ridge province. Boundary line and life estate locations are shown in Figure 3. Witness trees recorded at these localities are listed in Table 3 and summarized in Table 4. Although much of the vegetation within the region, particularly along alluvial bottomlands, had been extensively disrupted by aboriginal populations prior to Euroamerican settlement, these data provide at least a partial picture of late prehistoric environments. An examination of these data by landform and physiographic section suggests several noticeable trends. Bottomland hardwoods, dominated by elm and hackberry but comprised of several different species, were almost wholly restricted to the alluvial terrace landforms. Mesic upland species were dominant within the Lower Valley Uplands, Upper Valley Uplands, and Dissected Knobs. Post oak and black oak were the most common mesic upland species within the Lower Valley Uplands and Upper Valley Uplands samples while American chestnut was the dominant mesic species within the Dissected Knobs.

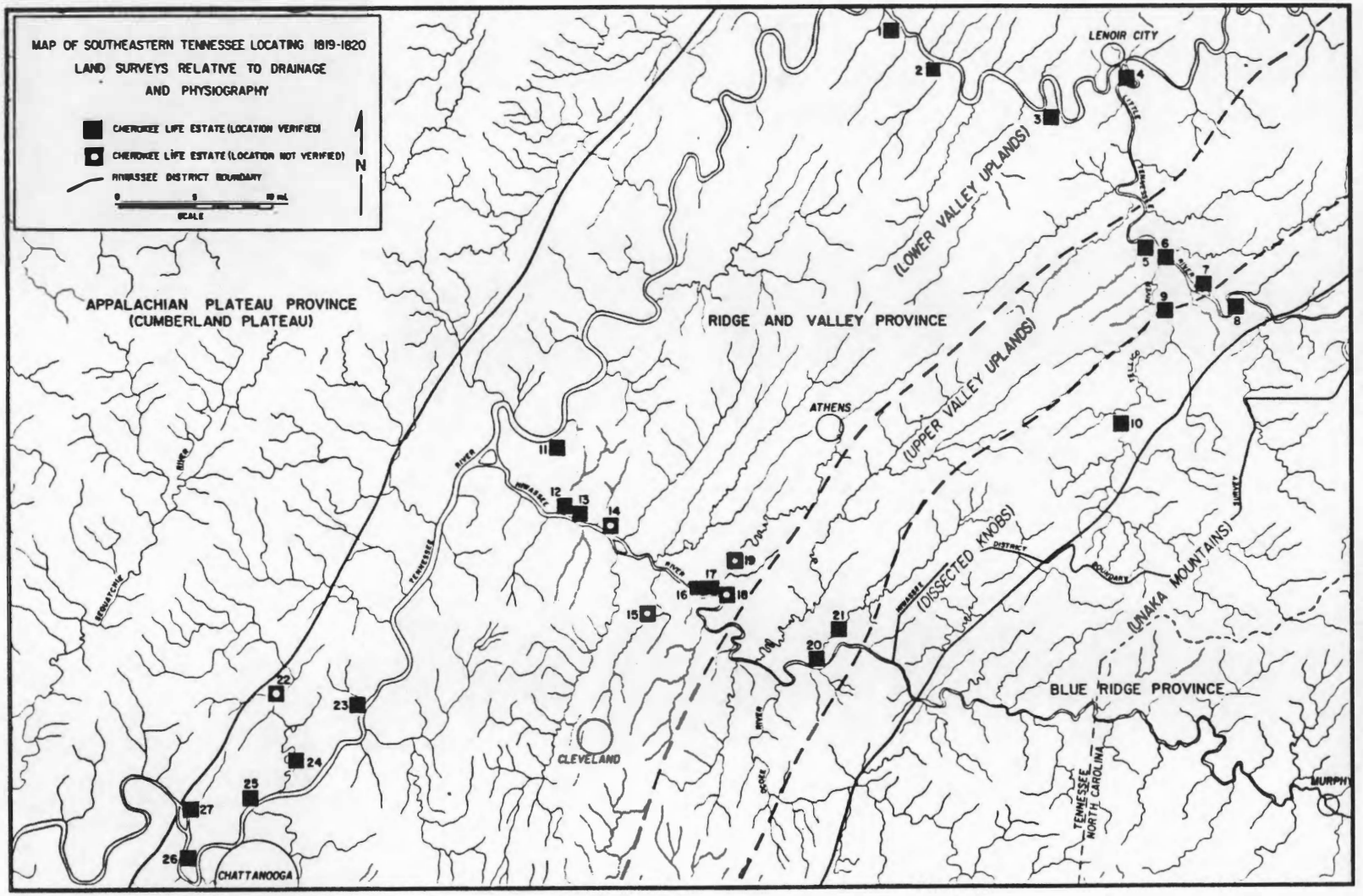


Figure 3. Map of southeastern Tennessee locating 1819-1820 land surveys relative to drainage and physiography.

Table 3. Distribution of early nineteenth century witness trees by survey tract.

Tract No.	River Terraces	Lower/Upper Valley Uplands	Dissected Knobs
1	1 Red Oak	1 Hickory, 1 Blackjack	-
2	1 Elm	-	-
3	1 Ash, 1 Elm, 1 White Oak, 1 Walnut	1 Chestnut, 1 Hickory, 1 Dogwood, 1 Spanish Oak 1 Red Oak, 1 Post Oak	-
4	1 Poplar, 1 Elm	1 Hickory, 1 Black Oak	-
5	-	4 Hickory, 1 Post Oak	-
6	1 Mulberry, 1 Hickory	3 Hickory, 1 Post Oak, 1 Black Oak	-
7	-	2 Hickory, 1 Ash, 1 Elm, 1 White Oak	-
8	1 Hackberry, 1 Wild Cherry, 2 Sassafras	-	1 Spanish Oak
9	-	-	1 Hickory
10	-	-	1 Pine, 1 Walnut, 1 Poplar
11	1 Hackberry, 1 Spanish Oak, 1 Ash	2 Post Oak, 2 White Oak	-
12	1 Sweet Gum, 1 Hackberry	2 Hickory, 1 Blackjack	-
13	1 White Oak, 1 Hornbeam	-	-
14	1 Sugar tree, 1 Hornbeam, 4 Dogwood	1 Post Oak	-
15	-	2 Post Oak, 1 Blackjack, 2 Black Oak	-
16	1 Hickory, 2 Black Oak, 1 Ash, 1 Sugar Tree	2 Hickory, 1 Post Oak	-
17	1 Beech, 1 Red Oak, 1 Hickory, 1 Elm, 1 Spanish Oak	1 Post Oak, 1 Poplar, 1 Pine	-
18	1 Sugar Tree, 1 Ash, 1 Beech	-	-
19	-	3 Black Oak, 2 Post Oak, 1 Pine	-
20	2 Hickory, 1 Mulberry, 1 Sycamore, 1 Spanish Oak	-	-
21	-	1 Post Oak	-
22	-	2 Pine, 2 Post Oak, 2 Black Oak	-
23	2 Elm, 1 Sycamore, 1 Maple	-	-
24	-	2 White Oak, 1 Dogwood, 1 Black Oak, 1 Black Gum	-
25	2 Spanish Oak, 1 Hackberry	1 Hickory, 1 Post Oak	-
26	4 Hackberry, 1 Maple, 1 Mulberry, 1 Elm	1 Hickory, 1 Black Oak	-
27	1 Box Elder, 1 Mulberry, 2 Black Walnut	1 Red Oak, 1 Black Oak, 1 Post Oak, 1 Dogwood	-
Hiwassee District Boundary	-	-	22 Pine, 10 Chestnut, 6 Red Oak, 6 White Oak, 5 Black Oak, 3 Chestnut Oak, 2 Hickory, 2 Blackjack, 2 Spanish Oak, 1 Maple, 1 Black Gum, 1 Poplar

Table 4. Distribution of early nineteenth century witness trees by landform/physiographic section.

Tree and Probable Generic Name[1]	Habitat[2]	River Terraces		Lower and Upper Valley Uplands		Dissected Knobs/ Blue Ridge	
		n	%	n	%	n	%
Hornbeam, Carpinua caroliniana	Bottomland	2	3.2	-	-	-	-
Beech, Fagus grandifolia	Bottomland	2	3.2	-	-	-	-
Elm, Ulmus sp.	Bottomland	7	11.1	1	1.4	-	-
Hackberry, Celtis occidentalis	Bottomland	8	12.6	-	-	-	-
Mulberry, Morus rubra	Bottomland	4	6.3	-	-	-	-
Sweet Gum, Liquidambar styraciflua	Bottomland	1	1.6	-	-	-	-
Box Elder, Acer negunda	Bottomland	1	1.6	-	-	-	-
Sugar Tree, Acer saccharum	Bottomland	3	4.8	-	-	-	-
Maple, Acer sp.	Bottomland	2	3.2	-	-	1	1.5
Ash, Fraxinus sp.	Bottomland	4	6.3	1	1.4	-	-
Sycamore, Platanus occidentalis	Bottomland	2	3.2	-	-	-	-
Black Walnut, Juglans nigra	Mesic Upland	3	4.8	-	-	1	1.5
Chestnut, Castanea dentata	Mesic Upland	-	-	1	1.4	10	15.3
Post Oak, Quercus stellata	Mesic Upland	-	-	19	26.8	-	-
White Oak, Quercus alba	Mesic Upland	2	3.2	5	7.0	6	9.1
Chestnut Oak, Quercus prinus	Mesic Upland	-	-	-	-	3	4.5
Spanish Oak, Quercus coccinea	Mesic Upland	5	7.9	1	1.4	3	4.5
Black Oak, Quercus velutina	Mesic Upland	2	3.2	10	14.1	5	7.6
Blackjack, Quercus marilandica	Mesic Upland	-	-	4	5.6	2	3.0
Wild Cherry, Prunus pensylvanica	Mesic Upland	1	1.6	-	-	-	-
Black Gum, Nyssa sylvatica	Mesic Upland	-	-	1	1.4	1	1.5
Hickory, Carya sp.	Xeric Upland	5	7.9	18	25.5	3	4.5
Sassafras, Sassafras albidum	Xeric Upland	2	3.2	-	-	-	-
Dogwood, Cornus sp.	Xeric Upland	4	6.3	3	4.2	-	-
Pine, Pinus sp.	Disturbed Upland	-	-	4	5.6	23	34.9
Poplar, Liriodendron tulipifera	Disturbed Upland	1	1.6	1	1.4	2	3.0
Total		63	100.0	71	100.0	66	100.0

[1] Nineteenth century survey reference.

[2] Habitat characterization based on Cridlebaugh (1984); habitat requirements derived from Harrar and Harrar (1962) and Radford et al. (1968).

Xeric upland species, represented largely by hickories, occured mostly within the Lower and Upper Valleys while disturbed upland species (e.g., pines) dominated the entire Dissected Knobs sample.

Several of the recorded witness trees represent nut-bearing or mast-producing species which would have been important to aboriginal populations by yielding edible nut crops and attracting exploitable fauna such as deer and turkey. Nut-bearing trees include oak, American chestnut, hickory, American beech, and black walnut, and occured mostly within the uplands, comprising 84.6% of the Lower and Upper Valley Uplands sample and 59.1% of the Dissected Knobs sample. In contrast, these species made up only 33.4% of the River Terraces sample. Assuming that the witness tree data reflect general vegetation patterns that were dominant prehistorically, the upland zones adjacent to the lower Little Tennessee River valley would have supported both a significantly higher proportion and greater absolute number of economically important (i.e., food-producing) species that could have been exploited seasonally by aboriginal inhabitants of the valley.

The third source of information concerning vegetation within the study area consists of archaeobotanical studies of carbonized plant remains. These studies have been directed primarily toward understanding aboriginal plant use (Chapman and Shea 1981) and, more recently, toward interpreting the effects of human occupation within the valley upon local vegetation (Cridlebaugh 1981, 1984). Chapman and Shea (1981:77-79) document a pattern of changing floral resource utilization which emphasizes the dominance of acorn and hickory nut

collection from the Early Archaic period (ca. 7,500 B.C.) to the early Historic period, partially supplanted by the increased importance of herbaceous seed crops after the Middle Archaic period (ca. 4,000 B.C.) and a progressively greater reliance upon tropical cultigens during the Late Archaic, Woodland, and Mississippian periods (2,500 B.C. to Historic period). Cultivation of tropical cultigens culminated in the development of an intensive maize agricultural system after about A.D. 1000. This generalized model of plant utilization implies a gradual shift through time from a predominantly upland-based resource collection strategy to a bottomland-based collection and cultivation strategy. The changing role of plants or plant parts (i.e., greens) which normally are not preserved within an archaeological context is unassessed by this model.

Increased disturbance of bottomland and adjacent upland habitats has been documented for the Woodland period (ca. 200 B.C.-A.D. 500), based upon wood charcoal data from selected archaeological contexts. Cridlebaugh (1981, 1984) has used these data to show that the mesic deciduous forests on the alluvial terraces of the lower Little Tennessee River valley and the immediately adjacent upland zone were being progressively disrupted and replaced during the Woodland period by disturbance-favored taxa, thereby creating conditions conducive to increased exploitation of herbaceous seed crops. The detection of this trend was based upon the changing composition of charcoal assemblages interpreted to represent indiscriminant firewood procurement. Causal factors which may explain these changes in forest composition include a greater demand for wood brought about by

increased sedentism or absolute population size and possibly the purposeful manipulation of the local environment related to plant cultivation. This trend of forest disruption undoubtedly intensified during the Mississippian period with the development of nucleated settlements, population expansion, and a shift toward a strong reliance on maize agriculture.

LOCAL FAUNA

The local fauna implied by eighteenth century descriptions of the region was both abundant and varied. Lt. Henry Timberlake, writing in 1765, noted a large number of buffalo, deer, bear, panther, wolf, fox, raccoon, opossum, beaver, otter, rabbit, squirrel, turkey, geese, duck, partridge, and pheasant within the lower Little Tennessee River valley (Williams 1927:69-71). Despite extensive modification of the local environment during the twentieth century, modern inventories of animal populations within East Tennessee and Great Smoky Mountains National Park still attest to the rich faunal diversity observed by Timberlake. These inventories are comprised of over 500 vertebrate species, including 72 mammalian species, about 247 avian species, 39 reptilian species, 39 species of amphibians, and 122 different species of fish (Bogan 1976:14-15). However, without a detailed knowledge of the local environment throughout prehistory, it is difficult to model the spatial variability of faunal resources within the region beyond the more obvious environmental associations. Disruption of forest habitats, either naturally or anthropogenically, probably had marked effects on both faunal resource distribution and density. For

example, studies by Ruff (1938) in the Pisgah National Game Preserve, North Carolina, suggest that white-tailed deer normally browse in open, disturbed, or edge areas, and only congregate in closed, mast-producing climax stands during the winter months. Other economically important species such as turkey also would have been attracted seasonally to stands of mast-producing trees (Shelford 1963:59).

Archaeologically retrieved faunal remains from Tellico Reservoir can be used to provide a general assessment of the relative importance of locally occurring species to aboriginal subsistence; however, these data are available primarily for the Late Mississippian and early Historic periods (see Bogan 1976, 1980). Faunal remains from earlier Woodland and Archaic period sites tend to be either extremely fragmentary or non-existent due to effects of extreme soil acidity. An analysis of almost 76,000 vertebrate faunal elements from the Late Mississippian Dallas occupation at Toqua (40MR6) identified the presence of over 100 species. Of these, deer was the best represented, followed by (in descending order of inferred relative importance) bear, turkey, raccoon, beaver, and woodchuck (Bogan 1980:54). Heavy reliance upon deer as a major protein source has been documented ethnographically for most Southeastern Indian groups (Swanton 1946:249). Evidence from Russell Cave, located approximately 100 miles southwest of the study area, suggests a similar pattern of faunal resource exploitation extending back to the Archaic period (Weigel et al. 1974).

SUMMARY

Although the lower Little Tennessee River valley offered its aboriginal inhabitants a rich and varied environment, most exploitable resources were not uniformly distributed within this environment. Given that any cultural adaptation within this region would have been structured in part both spatially and seasonally to maximize its resource potential, we may likewise expect the archaeological residues of past settlement systems to be differentially dispersed across the landscape, reflecting the specific manner by which prehistoric populations within the study area utilized the available resources. Some specific trends in variable resource availability and their implications for aboriginal land use are briefly summarized below.

First, the Little Tennessee River valley undoubtedly offered the greatest variety in resource availability. The alluvial terraces, being generally level, well drained, and located near a permanent water source, provided numerous sites suitable for both seasonal and permanent camps and villages. In addition, most potential habitation sites along alluvial terraces would have been situated within close proximity to several potentially distinct microenvironments, including the immediate riverine zone (i.e., river and shoreline), seasonally inundated lower alluvial terraces, upper terrace mesic habitats, and adjacent mesic and xeric upland forest habitats. The riverine zone offered a variety of exploitable aquatic fauna whereas both the shoreline and lower terrace habitats would have been unique in providing an extensive, seasonally disturbed habitat for herbaceous plants yielding edible greens and seed crops. This latter habitat

also would have seasonally attracted browsing animals such as deer. The upper terrace (T-2 and older) forest habitat would have supported a mesic bottomland forest of variable species composition, providing an abundant source of raw materials for structures, implements, and fuel, and also containing several exploitable nut-bearing tree taxa. Following the Early Woodland period (ca. 200 B.C.), this habitat was progressively disturbed by aboriginal populations, a process that would have served both to increase the density of usable, herbaceous plants and to create more browse for sustaining a larger deer population. In addition to these environmental factors, the alluvial terraces also offered rich, arable soils that were well suited to intensive agriculture.

The upland environment can be divided into three physiographic sections--Lower Valley Uplands, Upper Valley Uplands, and Dissected Knobs. The first two sections are quite similar in topography except for a general lack of major tributary streams within the Lower Valley Uplands. Both would have supported extensive forests comprised largely of nut-bearing and mast-producing species, and probably offered high densities of nut crops and animals attracted to masts such as deer, bear, and turkey during fall and early winter. With the deforestation of much of the bottomlands by Mississippian times, the immediate upland environs probably became more important as a source of wood and fuel. Although the Dissected Knobs also possessed a similar biotic resource potential (i.e., seasonally high densities of nut crops and certain animal species), the numerous stream valleys of the Tellico River drainage within this section would have provided

variable habitats more like those found within the Little Tennessee River valley.

In summary, both the lower Little Tennessee River valley and Dissected Knobs offered varied environments that could be easily exploited by habitation camps and villages positioned along the Little Tennessee and Tellico rivers, respectively. Because of restricted valley area, the Dissected Knobs probably supported a much smaller residential population. The Lower Valley Uplands, Upper Valley Uplands, and the non-riverine portion of the Dissected Knobs probably were unsuitable as residence locations due to seasonally limited resources, less fertile soil, and a paucity of permanent water sources. Consequently, it is likely that these areas were utilized primarily on a seasonal basis to obtain specific biotic resources.

CHAPTER IV

ARCHAEOLOGICAL SURVEY METHODS

Archaeological investigations within the lower Little Tennessee River valley were initiated by The University of Tennessee, Department of Anthropology, in 1967, and were directed toward mitigating the direct impact of the Tennessee Valley Authority's Tellico Reservoir Project. These investigations, including associated analyses of archaeological data, continued almost uninterrupted until 1979 when the reservoir was finally completed. Because of uncertainties throughout this period regarding the exact date of reservoir completion and the appropriation of funds to mitigate the loss of archaeological resources within the proposed reservoir, archaeological research was forced to proceed on a year-to-year basis. In addition, the continual threat of reservoir inundation resulted in virtually all archaeological work being confined to the proposed below pool zone (ca. 14,300 acres). As a consequence of this situation, the additional 22,000 acres of land surrounding the proposed Tellico Lake and also owned by the Tennessee Valley Authority remained an archaeological terra incognita. The only archaeological resources known to exist within this zone were a small number of conical burial mounds originally recorded in the late nineteenth century by the Smithsonian Institution (Thomas 1894).

Most of the archaeological effort within the reservoir proper focused upon intensive excavation at a few select sites. Research questions addressed by these investigations tended to be site-specific

and largely culture-historical in scope. One general result of this work was the documentation of a relatively continuous archaeological sequence from the Early Archaic period (ca. 7,500 B.C.) to the historic Overhill Cherokee occupation at the end of the eighteenth century. A major problem with this research was that it did not attempt to identify and evaluate the entire range of archaeological resources within the valley, nor did it provide a sufficient database for addressing broader questions related to aboriginal settlement systems and land use (Schroedl et al. 1975). The lack of systematic survey data prevented the consideration of research questions that were regional in scope.

NONPROBABILISTIC SURVEY DESIGN

Three phases of archaeological survey were undertaken prior to the initiation of a probabilistic survey in 1979; a fourth was undertaken afterwards to assess specific upland tracts being considered for development by TVA. A detailed history of investigations within the reservoir area, including an assessment of overall research value and sampling biases, is presented by Kimball (1985). More recent investigations within the uplands are reported by Davis (1980; Davis et al. 1982).

Initial archaeological survey (1967-1971) was directed toward identifying large and dense sites that were suitable for excavation (Salo 1967; Gleeson 1970, 1971). Sites identified through survey generally were not systematically recorded. With the exception of several large village sites previously recognized by the Smithsonian

Institution (Thomas 1894) and through the ethnohistoric record (Williams 1927), most sites recorded during this phase were situated along the first terrace of the Little Tennessee River.

The next phase of survey followed the recognition of deeply buried archaeological deposits at Rose Island (Chapman 1975). This discovery prompted an intensive, purposive, buried site survey during 1976-1977 along the first terrace of the Little Tennessee River, employing a backhoe (Chapman 1978). The buried site survey was significant because it documented the presence of numerous early, deeply buried sites within the valley. Unfortunately, although over 260 buried archaeological strata at over 70 sites were recorded, artifact samples generally were not obtained. Consequently, only a minimal amount of information about chronology and site function was generated for most sites.

Finally, recognition of previous inadequacies in archaeological surface survey prompted a brief yet relatively systematic reconnaissance of areas generally ignored by prior surveys. This survey, undertaken by Kimball and Bass in 1977, focused upon lands situated on the older terraces of the Little Tennessee River and along Tellico River, and recorded 129 new sites (Kimball 1985). Perhaps the most significant result of this survey was the clear recognition that the archaeological database generated collectively by both survey and excavation did not comprise a sufficient and usable information set for addressing regional research questions. This conclusion prompted the initiation of systematic, probability-based archaeological survey

within the below pool zone of Tellico Reservoir immediately prior to inundation in 1979.

PROBABILISTIC SURVEY DESIGN

Probabilistic surface sampling of the study area proceeded in three phases. Initial sampling was undertaken from October to December, 1979. This survey was confined to the below pool zone, and a total of 100 randomly selected sampling units (SU's) were surveyed (Davis 1980a). This survey employed controlled plowing of sampling units to produce uniform surface conditions and demonstrated the applicability of such a survey technique in regions where vegetation causes considerable surface sampling bias. Seventy-nine of the sampling units produced archaeological remains associated with the aboriginal occupation of the lower Little Tennessee River valley.

The second phase of probabilistic sampling was undertaken from March to July, 1980 and included the survey of 64 sampling units within a 2,600 acre upland tract adjacent to Tellico Lake and designated Industrial Area II (Davis 1980b). Forty of these sampling units produced archaeological remains. In addition to probabilistic survey, the entire area (including 850 acres that had been recently plowed) was intensively examined to identify additional sites. Comparisons of probabilistic and nonprobabilistic samples with respect to artifact composition and spatial distribution showed no significant differences and thereby provided empirical support for the use of the probabilistic sampling design to archaeologically assess the remaining 20,000 acres of TVA-owned uplands adjacent to Tellico Lake (Davis 1983).

The final phase of probabilistic survey was initiated in September, 1980 and was completed in September, 1981. During this phase, all remaining TVA lands were sampled. Of the 261 sampling units surveyed, 143 produced artifact samples. With the completion of this phase of survey, a total of 262 archaeological samples had been recovered from 425 sampling units (see Appendixes 2-3).

Sampling Methodology

Probabilistic archaeological survey within the study area employed a "non-site" sampling design. This necessitated abandoning the concept of site for the immediate purpose of archaeological resource identification and relying instead upon the systematic sampling and inspection of units of geographical space, defined by an imaginary grid imposed on the study area. The applicability of this general method of regional sampling for addressing questions about aboriginal land use has been amply demonstrated by Thomas (1971, 1975). Recently, Dunnell and Dancey (1983) have argued that use of the site concept within regional archaeological survey can actually inhibit a clear and concise understanding of the extinct behavioral systems being studied.

Two primary reasons can be offered for employing a "non-site" sampling design for regional land-use studies. First, most archaeological surveys are undertaken to gain some understanding of the kinds and frequency of archaeological manifestations present within a study area. Such surveys generally aspire to provide a sample in which all relevant archaeological resources expected to occur within a given area have an opportunity to be observed. If generalization is a

principal goal of an archaeological survey, then it would appear useful that some form of random sampling be employed to help insure that the resultant data represent an unbiased estimate of the phenomena they represent. Within the context of regional scale archaeological survey, the use of random sampling is even more important since such survey areas can seldom, if ever, be adequately investigated in their entirety. The use of random sampling in such cases allows the archaeologist to be selective without risking the introduction of sampling bias. When the population to be sampled is known and can be explicitly defined, random sampling is an easy and relatively straightforward task. Unfortunately, a survey that samples sites can seldom meet this requirement since the population of sites is almost never known beforehand. Therefore, sites are poorly suited as sampling units for probabilistic archaeological survey.

Second, there is a more fundamental problem with using the site as a primary unit of observation. Archaeological sites are not phenomena that can be observed in the field; rather, they are inferences made by the archaeologist which postulate a systemic relationship among the artifacts or archaeological features that define a site (see Binford 1975). Given that human behavior is seldom circumscribed in an absolute and finite manner, definitions of site boundaries usually are very imprecise and often are based upon the recognition of a limited range of site-specific archaeological residues. The entire spectrum of archaeological phenomena within a region usually can be expected to be highly variable with respect to site size, content, delimitation, and archaeological visibility;

consequently, their use as primary units of observation within archaeological survey is unnecessarily cumbersome and imprecise for certain kinds of research questions. Specifically, it can be argued that sites are inappropriate units of analysis for land use studies which must consider the full range of expected archaeological manifestations.

The method of sampling employed in the present study of land use patterns avoids this dilemma by sampling geographical space rather than archaeological phenomena. In addition to the Desert West where "non-site" or quadrat sampling has been widely used over the last two decades with considerable success (e.g., Bettinger 1977; Matson 1971; Matson and Lipe 1975; Thomas 1975), quadrat sampling also has been employed in at least two other regional surveys in the eastern United States (Nance 1980; O'Brien and Warren 1979). In both instances, site detection and surface collection of artifacts depended upon either the presence of exposed, cultivated fields or shovel tests. Random survey sampling in general is only beginning to be widely applied within the Southeast.

The paucity of previous systematic attempts at archaeological survey can be attributed to: 1) dense and highly variable vegetational conditions that prevent the recognition of archaeological phenomena in any reliable manner; 2) the heretofore lack of interest in addressing research questions which require comprehensive survey data on a regional scale; and 3) the still prevalent view held by many archaeologists that the primary role of archaeological survey is to locate large sites worthy of excavation. Probably the greatest

obstacle to the successful use of random survey sampling in the Southeast is the highly variable nature of surface conditions. Given the traditional methods of surface inspection to identify sites, it is easy to understand the reluctance among many archaeologists to embrace probabilistic sampling. In fact, at least one survey of a large reservoir employing a random sampling design was terminated prematurely due to difficulties imposed by less than adequate vegetation conditions (see Taylor and Smith 1978).

Others have had more success in locating sites through random sampling using a method of shovel probes or shovel tests (Ferguson and Pace 1981; Goodyear et al. 1979; House and Ballenger 1976; Lovis 1976; Nance 1980). A primary problem with this method of sampling is that it often provides little useful information beyond locating archaeological sites and defining site boundaries (based upon predetermined artifact frequency criteria). Specifically, such methods seldom provide artifact samples that are sufficiently large to generate statements regarding intrasite and intersite assemblage variability and to make inferences regarding site function. The use of shovel tests has been further criticized by Trinkley (1980) and Davis and Ward (1983) who note that sampling designs employing small collection units such as shovel holes or small surface exposures to detect sites are only consistently successful in locating large and extremely dense sites. The diffuse nature of surface artifacts comprising archaeological sites identified within Tellico Industrial Area II (Davis 1980b) suggests that such sites, common in upland habitats within the Tellico study area and considered to reflect

extractive activities, would not be easily detected by the kinds of shovel test strategies commonly employed.

A regional survey design that seeks to obtain usable artifact collections and is aimed at sampling the entire range of archaeological manifestations detectable at the surface should be based instead upon an artifact collection strategy that allows for systematic, uniform, and areally extensive examination of the surface. Whereas this can be easily accomplished in agriculturally prepared (i.e., plowed) fields, much of any regional sampling area is unlikely to be suited to this kind of survey coverage. Within the Tellico study area, uniform surface conditions within all sampling units were created through the use of controlled plowing. This procedure allowed the survey to generate directly comparable surface collections from all sampling units and provided for relatively extensive areal coverage when contrasted with shovel testing.

Sampling Units

The sampling unit employed by the probabilistic archaeological survey was a square quadrat measuring 300 ft on each side and encompassing approximately 2.07 acres. Sampling unit size was determined on the basis of both pragmatic and research-oriented considerations. Previous nonprobabilistic survey within Tellico Reservoir by Kimball (1980) provided general data for predicting the spatial dimensions of archaeological sites likely to be encountered within the survey area. Specifically, the 64 sites located between 1967 and 1976 had mean dimensions of 170.7 ft (sd=144.29) by 712.2 ft (sd=591.78) while 122 sites located during the 1977 survey have mean

dimensions of 157.8 ft (sd=91.21) by 422.1 ft (sd=318.79).

Given these data, it was felt that a unit size of at least 250 x 250 ft was essential to insure sampling of more than just a small, incomplete portion of most sites. Determination of maximum sampling unit size was affected by an entirely different set of criteria including: 1) the need to choose a "manageable" unit size such that a sufficiently large number of samples could be obtained from the survey area; 2) the desire to maintain intra-sampling unit homogeneity with regard to geo-topographic variables (e.g., slope, landform, soil, etc.); 3) the analytical consideration of artifact collections from sampling unit contexts as analogous to single-site or single-locus assemblages; and 4) the very real pragmatic considerations of the initial below pool survey brought about by a limited field season and a very uncertain future for archaeological survey within the study area. A 500 x 500 ft unit size was originally chosen but quickly abandoned as too large for the below pool survey. Following experimentation with a variety of grid overlays, 300 x 300 ft was considered to be an optimum size given the criteria stated above.

Another decision that had to be made concerned the method by which the sampling units would be prepared by plowing; specifically, whether or not to plow the entire sampling unit (2.07 acres). Given the relatively large amount of time required to plow and collect an entire sampling unit, a pattern of plowing was devised which reduced the time and effort expended at each unit while still maintaining systematic coverage of the entire sampling unit area (Figure 4). This pattern consisted of six 20 x 300 ft transects (i.e., three parallel

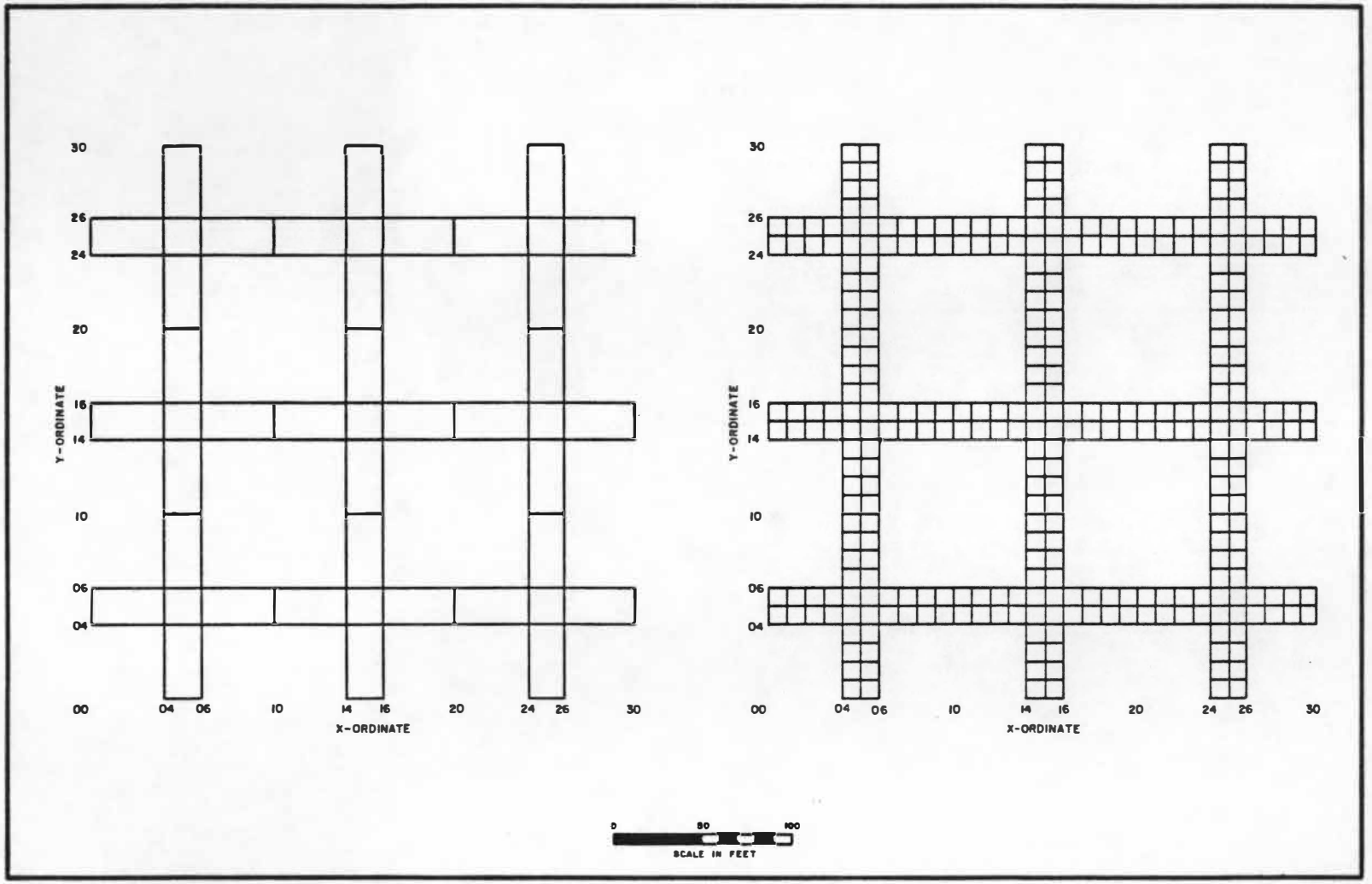


Figure 4. Plowing and collecting patterns for below pool (left) and upland (right) probabilistic surveys.

transects placed on 100-ft centers, crossed perpendicularly by three additional parallel transects also placed on 100-ft centers) that comprise 0.74 acres or 36% of the total surface area.

Fieldwork at each sampling unit proceeded in four phases: 1) locating the sampling unit in the field; 2) bushhogging to clear dense vegetation (if needed); 3) controlled plowing; and 4) artifact collection. The manner in which these four tasks were carried out differed between below pool and upland phases of sampling, and are discussed below.

Initially, sampling units were located in the field using 3-3/4 minute topographic maps (Scale=1:12,000). These were usually located with a transit and stadia rod or measuring tapes. Although most culturally-related features within the survey area had been destroyed by TVA clearing crews, it was often possible to use roads, house foundations, old fence lines, and stream confluences as approximate benchmarks. After a sampling unit had been located and staked out, a tractor-driven bushhog mowed the portions of the unit to be plowed. Several units were covered in 5-6 ft high weeds and some were partially grown over in pine and cedar saplings. Bushhogging was unnecessary at sampling units situated in pastures and in recently or actively cultivated agricultural fields. Sampling units were then plowed to ca. 0.8-1.0 ft depth. Most plowing was done with a two-bottom plow; however, some of the sampling units from the below pool survey were prepared with a three-bottom plow and two-bladed disk plow. All of these plows produced comparable results. In addition to plowing, upland sampling units (with few exceptions) were disked to

even out the plow furrows. Disking improved the collecting conditions at units located on clayey upland soils, but was unnecessary at below pool units where silty and sandy loams were predominant. Some upland units situated in actively cultivated fields did not require plowing or disking (Figure 5).

Finally, plowed transects at all sampling units were systematically surface collected following a sufficient amount (ca. >2.0 inches) of rainfall (Figure 6). Below pool sampling units were collected in 20 x 20 ft and 20 x 40 ft collection units; the remaining probabilistic samples were collected in 10 x 10 ft units (Figures 7-8). All objects (including rocks) visible on the surface of below pool sampling units were collected. This method insured optimum recovery of artifacts and tended to eliminate collector bias. Total collection of the sampling unit surface was abandoned within the uplands since most units contained numerous quartzite cobbles or weathered chert residuum. Amounts of rainfall preceding surface collection also varied between valley and upland units. Most below pool and Industrial Area II sampling units received from 1.0-2.0 inches of measured rainfall whereas the remainder of the units received over 3.0 inches. Systematic recollection of several sampling units throughout the study area following additional rainfall suggests that the effects of these rainfall differences upon the overall sample are not significant. Effects of rainfall upon surface collections within Tellico Reservoir are considered more explicitly by Baden (1982b).

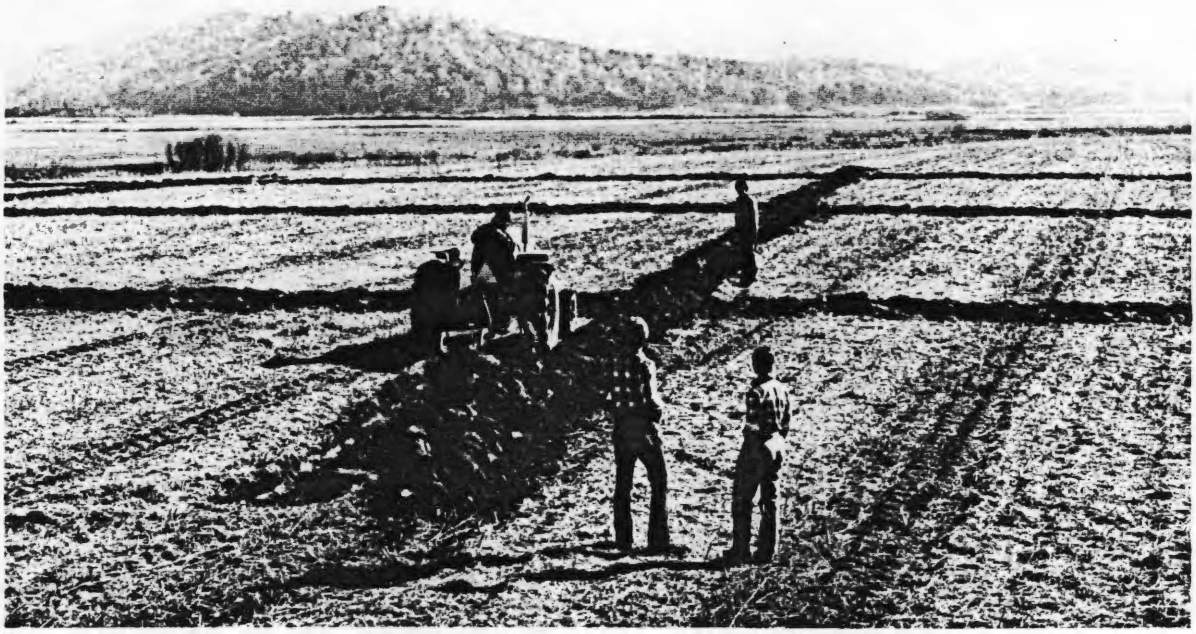


Figure 5. Controlled plowing of a probabilistic sampling unit.



Figure 6. Surface collecting a probabilistic sampling unit.



Figure 7. View of a typical below pool probabilistic sampling unit.



Figure 8. View of a typical above pool probabilistic sampling unit.

Sampling Area

The probabilistic sampling area consisted of approximately 34,444 acres of contiguous bottomland and upland adjacent (i.e., within 1-3 mi) to the lower Little Tennessee River between RM 0 and 33.5, and along Tellico River and its major tributaries for approximately 20 mi above its confluence with the Little Tennessee River. This area is artificially circumscribed, including only land owned by the Tennessee Valley Authority. Approximately 8,232 acres of this area was forested at the time of survey and therefore was excluded from sampling. The sampling population consisted of the 12,663 sampling units. The sampling area was divided into nine separate sampling strata. Maps showing the locations of these strata are presented in Appendix 1. Sampling units within these strata were subsequently recombined into four sampling domains for analysis purposes (Figure 9).

Sampling Strata

The nine sampling strata are as follows:

1) Lower Main Valley - This stratum included all sampling units located on alluvial terraces of the Little Tennessee River below the mouth of Tellico River (RM 0-18.5) and sampled as part of the below pool survey. The terrace systems encompassed by this stratum are moderately extensive and provided numerous well-drained habitats suitable for human occupation. The Lower Main Valley stratum included 1,092 sampling units and comprised 8.6% of the total sampling population.

2) Upper Main Valley - The Upper Main Valley stratum included all sampling units inundated by Tellico Lake on alluvial terraces of the

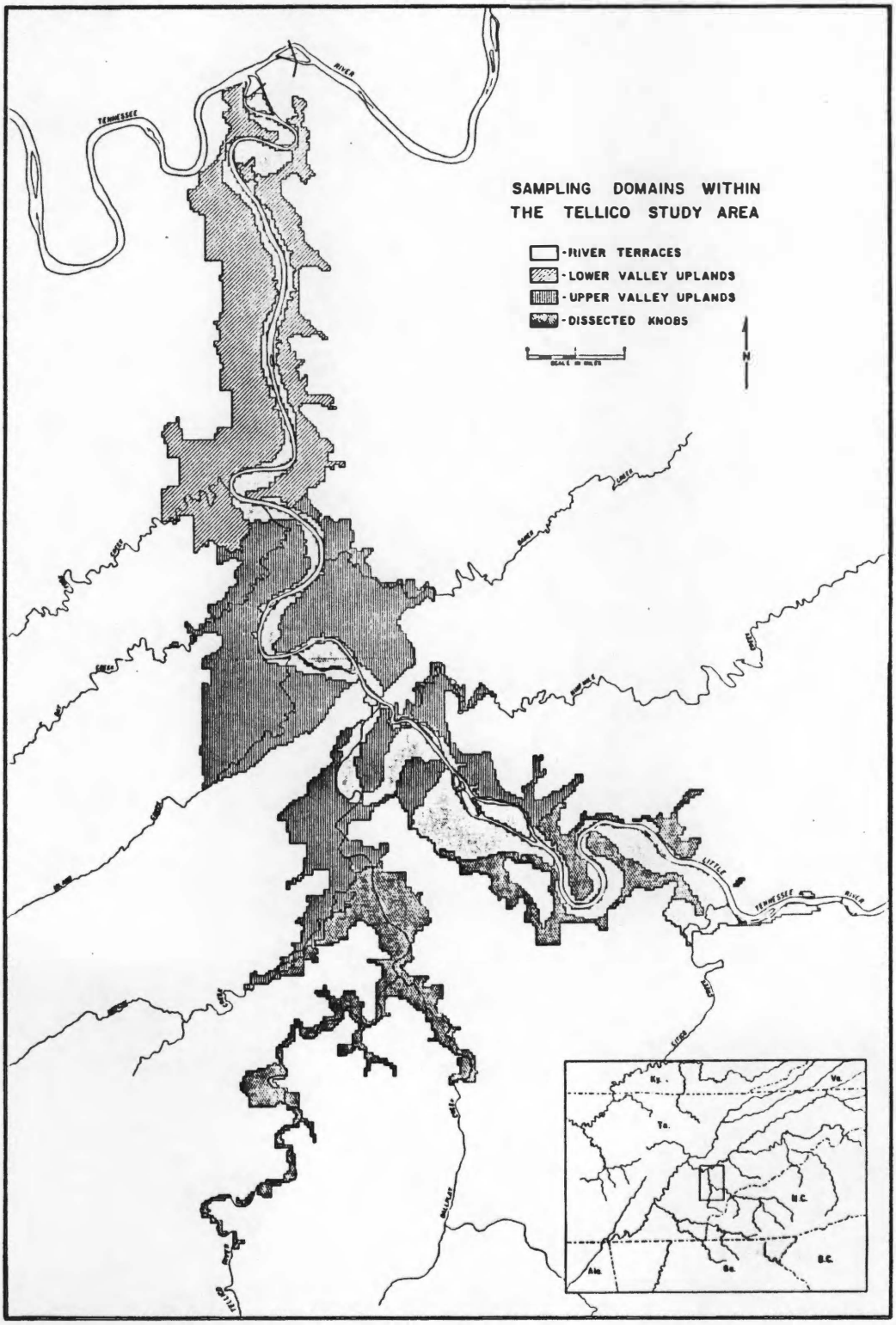


Figure 9. Map of the Tellico study area showing sampling domains employed by the probabilistic survey.

Little Tennessee River above the mouth of Tellico River and below the uppermost end of the impoundment zone near Citico Creek (RM 31.0). Thirteen hundred twenty-eight sampling units comprised this sampling stratum. Most of the area encompassing the Upper Main Valley stratum was situated on the south side of the Little Tennessee River where terrace development was extensive. The Upper Main Valley stratum comprised 10.5% of the sampling population.

3) Main Valley Tributaries - This stratum consisted of all sampling units inundated by Tellico Lake and situated adjacent to or on tributaries of the Little Tennessee River, excluding Tellico River drainage. Sampling units were almost wholly restricted to the extreme lower valley where a significant proportion of the valley slopes and tributaties were below 813-ft elevation (i.e., pool level). This stratum contained 2,934 sampling units and comprised 23.2% of the sampling population.

4) Tellico River Drainage - The Tellico River Drainage sampling stratum included all sampling units (n=1,272) located along Tellico River and its tributaries within the below pool zone of Tellico Lake. The majority of these units were situated on alluvial terraces of Tellico River, Notchy Creek, and Ballplay Creek. This stratum comprised 10.0% of the total sampling population.

5) Area II - The Area II stratum consisted of 1,317 sampling units situated within the upland zone adjacent to Tellico Lake between Bat Creek and Island Creek. This stratum was sampled to assess a proposed TVA industrial area and to determine the applicability of the

below pool sampling design for upland survey. The Area II stratum comprised 10.4% of the sampling population.

6) Lower Valley Uplands - The sampling area covered by the upland probabilistic survey was divided into four strata that coincided with the four primary sampling domains representing major geo-topographic zones within the study area. These included: Lower Valley Uplands, Upper Valley Uplands, Dissected Knobs, and Alluvial Terraces. The Lower Valley Uplands stratum consisted of 1,682 sampling units, or 13.3% of the sampling population, located adjacent to the Little Tennessee River valley between the mouth of the Little Tennessee River and Bat Creek-Red Knobs (RM 12.5). Sampling units were situated on both sides of the valley and extended from 0.5-1.0 mi away from the valley edge. This stratum, as with the Upper Valley Uplands and Dissected Knobs strata, was broken up by unsampled tracts of forested land.

7) Upper Valley Uplands - This sampling stratum was comprised of 2,086 sampling units situated on non-wooded, non-alluvial terrace lands adjacent to the Little Tennessee River valley between Bat Creek-Red Knobs and Notchy Creek Knobs (RM 23.5). Major tracts of sampled land occurred on Wear Bend (RM 16.0) and within the general vicinity of the Tellico River confluence with the Little Tennessee River. Approximately 16.5% of the sampling population were included within this stratum.

8) Dissected Knobs - The Dissected Knobs stratum included all sampling units on non-inundated lands east of Notchy Creek Knobs, excluding remnants of the Little Tennessee River terrace system

adjacent to the upper end of Tellico Lake. Four hundred and thirty units were included in this stratum, which comprised only 3.4% of the sampling population. Since most land within the Dissected Knobs area was steeply sloped and forested, sampling units generally were restricted to the valley margins of the Little Tennessee and Tellico rivers where remnants of cleared, old agricultural fields were present.

9) Alluvial Terraces - This stratum comprised 4.1% of the sampling population and consisted of 523 sampling units situated on non-inundated alluvial terraces of the Little Tennessee River between Bacon Bend (RM 26.0) and Chilhowee Dam.

Sampling Domains

The nine sampling strata were post-stratified into four sampling domains representing major geo-topographic zones (Figure 2). Based upon an evaluation of differences in habitat suitability and resource potential among these domains, it was suspected that land uses represented by archaeological materials from the domains would be dissimilar. The specific environments represented by the four sampling domains, as well as the variability in aboriginally relevant natural resources, are detailed in the previous chapter.

The four sampling domains are defined below:

1) Alluvial Terraces - This sampling domain was defined by all sampling units located within the alluvial valley of the Little Tennessee River. The Alluvial Terraces domain contained all units from the Lower Main Valley, Upper Main Valley, and Alluvial Terraces

strata, and portions of the Main Valley Tributaries (13.8%) and Tellico River (16.7%) strata.

2) Lower Valley Uplands - The Lower Valley Uplands domain comprised 22.3% of the sampling population, and included all non-valley sampling units between the mouth of the Little Tennessee River and Bat Creek-Red Knobs. As such, it contained all of the Lower Valley Uplands stratum and 38.9% of the Main Valley Tributaries stratum.

3) Upper Valley Uplands - The Upper Valley Uplands was defined by all non-valley sampling units located between Bat Creek-Red Knobs and Notchy Creek Knobs. It included all of the Upper Valley Uplands and Area II strata, 43.1% of the Main Valley Tributaries stratum, and 42.3% of the Tellico River Drainage stratum. The Bat Creek-Red Knobs portion of the survey area was also included within this domain; however, most sampling units could not be surveyed due to steep slope and forestation.

4) Dissected Knobs - The Dissected Knobs domain consisted of all sampling units between Notchy Creek Knobs and Chilhowee Dam not located on alluvial terraces of the Little Tennessee River, and comprised 8.5% of the sampling population. This domain was made up of the Dissected Knobs stratum, 4.2% of the Main Valley Tributaries stratum, and 41.0% of the Tellico River Drainage stratum.

Sample Size and Method of Selection

Sample size varied among the nine sampling strata according to survey phase (i.e., below pool, Area II, uplands) and data needs. Relatively small samples were obtained from the four below pool strata

due to time constraints. One hundred sampling units were surveyed from these below pool strata, representing sampling fractions (f) that range from f=.015 to f=.023. It is unfortunate that a larger sample could not be obtained prior to inundation since the valley proper was clearly the focus of most prehistoric activity. Upland strata, conversely, produced samples that were both relatively and absolutely larger. Samples from these strata ranged in size from n=22 to n=110 and represent sampling fractions of f=.042 to f=.100. In all, 425 sampling units (overall f=.034) were examined as part of the Tellico Probabilistic Survey. The distribution of these sampling units among the nine sampling strata and four domains is summarized in Table 5.

The decision to obtain larger samples from the upland strata followed an analysis of probabilistic and nonprobabilistic survey data from Area II (Davis 1980b, 1981). Specifically, a five percent probabilistic sample was drawn and compared with the results of an extensive and systematic nonprobabilistic survey that included coverage of over 800 acres (ca. 30% of Area II) with moderate to excellent surface visibility. These data were analyzed to assess differences between the probabilistic sample (i.e., the 41 units that produced archaeological remains) and the total site sample (n=130) with respect to predicted cultural period representation, artifact density, spatial distribution relative to stream proximity, and activity representation based upon variability in artifact assemblage composition. It was found that only the temporal dimension was not adequately estimated by the probabilistic sample due to a paucity of diagnostic artifacts (Davis 1980a). Given these results and the

Table 5. Sampling domain composition following post-stratification.

Original Sampling Stratum	Alluvial Terraces Domain				Lower Valley Uplands Domain				Upper Valley Uplands Domain				Dissected Knobs Domain				Total n
	n_h	N_h	W_h	f_h	n_h	N_h	W_h	f_h	n_h	N_h	W_h	f_h	n_h	N_h	W_h	f_h	
Lower Main Valley	16	1092	.31	.015	-	-	-	-	-	-	-	-	-	-	-	-	16
Upper Main Valley	20	1328	.37	.015	-	-	-	-	-	-	-	-	-	-	-	-	20
Main Valley Tributaries	7	406	.11	.017	15	1140	.40	.012	23	1264	.24	.018	0	123	-	.000	45
Tellico River Drainage	5	213	.06	.023	-	-	-	-	7	538	.10	.013	7	521	.55	.013	19
Area II	-	-	-	-	-	-	-	-	64	1317	.26	.049	-	-	-	-	64
Lower Valley Uplands	-	-	-	-	86	1682	.60	.051	-	-	-	-	-	-	-	-	86
Upper Valley Uplands	-	-	-	-	-	-	-	-	110	2086	.40	.053	-	-	-	-	110
Alluvial Terraces	-	-	-	-	-	-	-	-	-	-	-	-	43	430	.45	.100	43
Dissected Knobs	22	523	.15	.042	-	-	-	-	-	-	-	-	-	-	-	-	22
Domain Total	70	3562	1.00	.020	101	2822	1.00	.035	204	5205	1.00	.040	50	1074	1.00	.052	425

n_h - Sample size (i.e., number of sampling units surveyed).

N_h - Population size (i.e., total number of sampling units).

W_h - Stratum weight within domain$_h$ ($W_h = N_h/N$).

f_h - Stratum sampling fraction ($f_h = n_h/N_h$).

Domain sampling fractions are calculated as follows: $f = \sum W_h f_h$.

anticipation of better temporal data from an increased absolute sample size (n) for the remainder of the uplands and detailed analysis of temporal sensitivity within certain classes of lithic debitage, it was decided that a sampling fraction of f=.05 should be adequate for the Lower Valley Uplands, Upper Valley Uplands, and Alluvial Terraces strata. A fraction of f=.10 was chosen for the Dissected Knobs stratum due to the small population size of this stratum and the fact that few units sampled by the below pool survey would be incorporated within the Dissected Knobs domain following post-stratification.

The general procedure used to select a sample from a given stratum was as follows. First, lands located on the 22 Tellico Project 3-3/4 minute topographic maps and situated within the sampling area were gridded into 300 x 300 ft units. Next, all units within a given sampling stratum (excluding forested units except in Area II) were identified and labeled consecutively from 1 to n. A list of the appropriate number of sampling units was then randomly generated. An additional sample, usually of the same size, was also generated to provide a pool of alternate sampling units in case some of the initial units were found to be unsuitable due to recent disturbances or reforestation. Sampling units were then identified on the project topographic maps and subsequently located in the field.

Assessment of Sampling Bias

Exclusion of wooded units from the overall sampling frame represents one source of possible bias in the probabilistic sample. To assess this possibility, a sampling experiment was undertaken that included these wooded units. Specifically, simple random samples of

wooded units were drawn from each sampling domain. Samples were drawn only from the four above pool survey strata (i.e., Alluvial Terraces, Lower Valley Uplands, Upper Valley Uplands, Dissected Knobs). Below pool strata were excluded from consideration since no major wooded areas existed within these strata. Likewise, Area II was not considered since all wooded units were included within the sampling frame for this stratum.

Wooded samples drawn from the four upland domains are summarized as follows:

Domain	n	N	f^1	f^2
Alluvial Terraces	25	51	.490	.014
Lower Valley Uplands	50	1200	.042	.298
Upper Valley Uplands	50	1178	.042	.185
Dissected Knobs	50	1548	.032	.590

[1] sampling fraction

[2] proportion of domain.

Potential sampling bias was analyzed by comparing these wooded sampling units with the non-wooded sampling units that comprise the survey sample (n=425). Comparison involved seven environmental variables suspected to affect aboriginal land use and, by extension, the location and spatial distribution of archaeological resources. These variables included:

1) Landform - Previous analyses regarding the spatial location of archaeological resources within Tellico Reservoir indicated that they were differentially distributed with respect to landform class (Davis 1985; Kimball 1985). Nine major landform classes are recognized

within the study area: T-1 Terrace, T-2 Terrace, Older Terraces, Little Tennessee River Valley Slope, Tellico River Valley, Tellico River Valley Slope, Primary Tributary Valleys, Primary Tributary Valley Slopes, and Uplands.

2) Nearest Water Source - Analysis of the Area II probabilistic and nonprobabilistic survey data suggested a linear relationship between archaeological site density and proximity to the Little Tennessee River and its primary tributaries (Davis 1980b). Areas lacking permanent surface water sources tended to be devoid of archaeological resources representing more than limited extractive behavior.

3) Slope - While not specifically examined by previous analyses, it can be argued using the Tellico probabilistic sample that the spatial distribution of archaeological resources (particularly upland resources) is partially restricted by surface slope. It can also be shown that slope is a factor governing the placement of residential sites. Therefore, slope was considered a useful variable for comparing wooded and non-wooded sampling units. Slope was measured to the nearest degree, using available 3-3/4 minute topographic maps with 5-ft contour intervals, and then grouped into 5-degree ordinal categories (i.e., 1-5 degrees, 6-10 degrees, etc.).

4) Elevation Above Nearest Water Source - The difference in elevation between archaeological resources and nearest water source was not previously examined. However, present survey data indicated that this variable might also represent a determinant of archaeological site location. Elevation above nearest water source

was measured to the nearest 5 ft using 3-3/4 minute topographic maps with 5-ft contour intervals. These measurements were then grouped into 25-ft ordinal categories (i.e., 5-25 ft, 30-50 ft, etc.).

5) Distance From Little Tennessee/Tellico River - As stated earlier, the relationship between archaeological resource density and stream distance was previously recognized within the survey area (Davis 1980b). Samples drawn from wooded and non-wooded areas were therefore compared with respect to distance from the Little Tennessee/Tellico rivers. Distances were measured from topographic maps to the nearest 100 ft and were subsequently grouped into 1,000-ft ordinal categories (i.e., 100-1,000 ft, 1,100-2,000 ft, etc.).

6) Distance From Primary Tributary - This measurement was determined by the shortest distance from a sampling unit to the nearest primary tributary. Distances were taken from topographic maps, measured to the nearest 100 ft, and subsequently grouped into 5,000-ft ordinal categories (i.e., 100-5,000 ft, 5,100-10,000 ft, etc.).

7) Distance From Secondary Tributary - This variable was measured as the shortest distance to the nearest secondary tributary shown on 3-3/4 minute topographic maps of the project area. Distance was measured to the nearest 100 ft and subsequently grouped into 500-ft ordinal categories (i.e., 100-500 ft, 600-1,000 ft, etc.).

All variables were measured separately for randomly selected wooded units in each sampling domain. These variables also were measured for units comprising the Tellico probabilistic sample and were summarized for each domain as estimated proportions derived from

a stratified random sample (i.e., $P_{st} = \sum W_h P_h$, see Cochran 1977). A Chi-square two-sample test was used to evaluate differences between wooded and non-wooded samples with respect to landform and nearest water source (Table 6). The remaining variables were evaluated using a Kolmogorov-Smirnov two-sample test (Table 7). All tests evaluated the null hypothesis of no significant difference between wooded and non-wooded samples at $p<.001$. Given that these variables either directly or indirectly monitor key factors affecting site location and distribution, the two-sample comparisons provided an objective means of assessing the degree of confidence which should be placed on the Tellico probabilistic sample relative to the entire study area.

Wooded and non-wooded sampled populations within the Alluvial Terraces domain differed significantly for three variables: landform, nearest water source, and distance from the Little Tennessee/Tellico rivers. This was due largely because most wooded units in this domain were restricted to a single area--the older terrace remnants of the Little Tennessee River along Citico Creek. Since the proportion of wooded units to the entire domain is extremely low ($p=.014$), these differences are considered to have only a minimal effect upon reliably estimating population parameters within this domain.

The two sampled populations within the Lower Valley Uplands domain were significantly different only with respect to surface slope. No sampled non-wooded units exceeded 10 degrees in slope and 80% had less than five degrees slope; conversely, almost 70% of the wooded units exceeded five degrees in slope and several units had slopes greater than 10 degrees. In short, wooded units tended to be

Table 6. Summary of Chi-square two-sample tests comparing wooded (unsampled) and non-wooded (sampled) areas within each domain to assess sampling bias.

Variable	Domain	Analyzed Variable Categories	No. of Sampling Units[1] Wooded	Non-wooded	df	Critical Value ($p<.001$)	x^2
Landform	Alluvial Terraces	T1/T2	7	47	1	10.83	13.16*
		Older Terraces/Other	18	23			
	Lower Valley Uplands	LTRV Slope	7	10	2	13.82	1.27
		Primary Tributary	2	8			
		Uplands	41	83			
	Upper Valley Uplands	LTRV/TRV	8	15	2	13.82	8.44
		Primary Tributary	8	70			
		Uplands	34	119			
	Dissected Knobs	LTRV/TRV	8	34	2	13.82	36.77*
		Primary Tributary	7	10			
		Uplands	35	6			
Nearest Water Source	Alluvial Terraces	LTR/TR	0	43	2	13.82	31.56*
		Primary Tributary	7	10			
		Secondary Tributary	19	25			
	Lower Valley Uplands	LTR/TR	4	8	2	13.82	0.21
		Primary Tributary	3	8			
		Secondary Tributary	43	85			
	Upper Valley Uplands	LTR/TR	7	26	2	13.82	8.91
		Primary Tributary	4	57			
		Secondary Tributary	39	121			
	Dissected Knobs	LTR/TR	5	25	2	13.82	28.22*
		Primary Tributary	5	12			
		Secondary Tributary	40	43			

* Denotes a significant X^2 value.

[1] Number of non-wooded sampling units indicates the expected number based upon a stratified sample, and was calculated as follows: $n_{st}=n\sum W_h p_h$, where n=domain sample size, $W_h=N_h/N$ (stratum weight), and p_h=proportion of units in stratum$_h$.

Abbreviations: T1-first terrace; T2-second terrace; LTRV-Little Tennessee River Valley; TRV-Tellico River Valley; LTR-Little Tennessee River; TR-Tellico River.

Table 7. Summary of Kolgomorov-Smirnov two-sample tests comparing wooded (unsampled) and non-wooded (sampled) areas within each domain to assess sampling bias.

Variable	Domain	D	df	Critical X^2 Value (p=.001)	X^2
Slope	Alluvial Terraces	-	-	-	0
	Lower Valley Uplands	.474	2	13.82	30.06*
	Upper Valley Uplands	.419	2	13.82	28.20*
	Dissected Knobs	.888	2	13.82	78.85*
Elevation Above Nearest Water	Alluvial Terraces	.120	2	13.82	1.06
	Lower Valley Uplands	.245	2	13.82	8.03
	Upper Valley Uplands	.276	2	13.82	12.27
	Dissected Knobs	.611	2	13.82	37.33*
Distance From Little Tennessee/ Tellico River	Alluvial Terraces	.721	2	13.82	38.33*
	Lower Valley Uplands	.152	2	13.82	3.09
	Upper Valley Uplands	.259	2	13.82	10.78
	Dissected Knobs	.532	2	13.82	28.30*
Distance From Nearest Primary Tributary	Alluvial Terraces	.339	2	13.82	8.49
	Lower Valley Uplands	.314	2	13.82	13.19
	Upper Valley Uplands	.260	2	13.82	10.83
	Dissected Knobs	.181	2	13.82	3.28
Distance From Nearest Secondary Tributary	Alluvial Terraces	.271	2	13.82	5.40
	Lower Valley Uplands	.110	2	13.82	1.62
	Upper Valley Uplands	.062	2	13.82	0.62
	Dissected Knobs	.069	2	13.82	0.47

* denotes significant X^2 value.

more closely associated with relatively steep terrain. Given these results, observations made for the Lower Valley Uplands domain cannot be considered reliable for steep surfaces (i.e., >10 degrees). Almost one-third of the total sampling units within the Lower Valley Uplands are wooded; therefore, any estimates of archaeological resource density within this domain will be biased and probably slightly inflated.

Wooded and non-wooded sampled populations within the Upper Valley Uplands also differed only with respect to surface slope. Like the situation observed for the Lower Valley Uplands, almost 74% of the non-wooded sampling units had surfaces that were less than five degrees in slope and none exceeded 15 degrees. However, almost 70% of the wooded units were greater than 10 degrees and some were as steep as 25 degrees. In sum, wooded units in this domain tend to be steeper than non-wooded units. It was concluded, therefore, that the sample actually drawn from the Upper Valley Uplands was biased against steep surfaces and probably resulted in a slight over-estimation of archaeological resource density (given an inverse relationship between site occurrence and slope). Since wooded units in the Upper Valley Uplands comprise less than 19% of the total domain, the overall effect of this bias is probably minor.

In contrast to the three aforementioned sampling domains, the Dissected Knobs wooded and non-wooded units were significantly different for five variables: landform, nearest water source, slope, elevation above nearest water, and distance from the Little Tennessee/Tellico rivers. Since wooded units comprise almost 60% of

this total domain, serious sampling biases are considered to exist. All significant differences are attributed to a single source--the restriction of non-wooded sampling units to alluvial valleys and lower valley slopes of the Little Tennessee and Tellico river drainages. This situation is due to the rugged nature of the Dissected Knobs terrain and because only the alluvial valleys have been extensively transformed into agriculturally productive land. The situation is further compounded by the fact that the survey area within this domain was largely restricted to the reservoir area and the steep forested slopes adjacent to the reservoir. As a result, most of the units sampled from the Dissected Knobs stratum were located at the edge of the reservoir on previous agricultural lands. Because of this, extension of the survey results to the entire Dissected Knobs domain cannot be justified.

In summary, the sampling biases resulting from the exclusion of wooded, upland sampling units exist to varying degrees for all four sampling domains. Severe biases, however, exist only for the Dissected Knobs, preventing the valid extension of the survey results to the entire domain. Samples from the Alluvial Terraces, Lower Valley Uplands, and Upper Valley Uplands should be adequate for making generalizations about the nature and extent of archaeological resources within these sampling domains.

CHAPTER V

DETERMINATION OF CHRONOLOGY

The derivation of culture-specific settlement patterns from general site patterns is predicated upon the correct identification of chronological position and cultural association of identified sites and artifact assemblages. Archaeological investigations within the study area, conducted by The University of Tennessee between 1967 and 1981, generated sufficient data both for documenting a 12,000-year span of occupation prior to Euroamerican settlement in the early nineteenth century, and for establishing a chronological framework to organize data generated by archaeological surveys and excavations.

Seventeen separate cultural units comprising three major cultural periods (Archaic, Woodland, Mississippian) have been recognized by previous researchers (see Chapman 1985a; Kimball 1985; Schroedl et al. n.d.). Components of all units were sampled through archaeological excavation. Most of these represent the remains of base camps or habitation sites. In addition, sparse evidence consisting of projectile point finds indicates the possible presence of at least four other cultural units representing the Paleo-Indian, Early Archaic, and Middle Archaic periods. These units, however, remain undefined because of a lack of excavated contexts (Table 8).

With few exceptions, the recognition and designation of cultural units within Tellico Reservoir has been based upon chronological frameworks established elsewhere within the Southeast (cf. Broyles 1966, 1971; Coe 1964; Keel 1976; Lewis and Kneberg 1946; Whiteford

Table 8. Chronological framework for the Tellico Study Area.

Time Period	Temporal Unit (Kimball 1985)	Estimated Range	Phase
HISTORIC			
(Mississippian IV)	Overhill	AD 1600-1838	Overhill
LATE MISSISSIPPIAN			
(Mississippian III)	Dallas & Mouse Creek	AD 1300-1600	Dallas
EARLY MISSISSIPPIAN			
(Mississippian II)	Hiwassee Island I & II	AD 1000-1300	Hiwassee Island
(Mississippian I)	Martin Farm	AD 900-1000	Martin Farm
MIDDLE WOODLAND			
(Woodland III)	Icehouse Bottom	AD 350-600	Icehouse Bottom
(Woodland II)	Patrick	200 BC-AD 350	Patrick
EARLY WOODLAND			
(Woodland I)	Bacon Bend	1,000-200 BC	Watts Bar
LATE ARCHAIC			
	Undesignated (Iddins)	1,800-1,000 BC	Iddins
	Undesignated (Savannah River)	3,000-1,800 BC	Savannah River
MIDDLE ARCHAIC			
	Undesignated (Sykes)	4,500-3,000 BC ?	-
	Undesignated (Guilford)	5,000-4,000 BC ?	-
	Morrow Mountain	5,500-5,000 BC	Morrow Mountain
	Stanly	5,800-5,500 BC	Stanly
	Stanly	6,000-5,800 BC	Kirk Stemmed
EARLY ARCHAIC			
	Kanawha	6,100-5,800 BC	Kanawha
	LeCroy	6,500-5,800 BC	LeCroy
	St. Albans	6,900-6,500 BC	St. Albans
	Upper Kirk	7,400-6,800 BC	Upper Kirk
	Lower Kirk	8,000-7,300 BC	Lower Kirk
	Undesignated (Dalton)	8,500-8,000 BC ?	-
PALEO-INDIAN			
	Undesignated (Clovis)	11,000-8,500 BC ?	-

1951). Correlation with these frameworks within the study area usually was based upon culturally diagnostic artifacts--namely, projectile point and pottery types. The temporal model used in the present study is similar to one proposed by Kimball (1985), based upon his analysis of lithic and ceramic artifact samples from selected contexts in Tellico Reservoir and his reassessment of available radiocarbon dates for east Tennessee and adjacent regions. Whereas Kimball's cultural units were narrowly defined as separate time intervals in which specific projectile point types and ceramic types occurred, they are considered here more as archaeological phases. In doing so, additional data regarding overall artifact assemblages and archaeological features are used in defining individual phases. A phase is defined as an archaeological construct "possessing traits sufficiently characteristic to distinguish it from all other units similarly conceived . . ., spatially limited to . . . a locality or region and chronologically limited to a relatively brief interval of time" (Willey and Phillips 1958:22).

This chronological framework and the archaeological basis for it within Tellico Reservoir are briefly summarized below.

Paleo-Indian Period (before 8,500 B.C.)

The presence of man within the study area prior to about 8,500 B.C. is poorly documented and evidence consists entirely of isolated occurrences of fluted projectile points of the Clovis type. Although it is conceivable that Paleo-Indian campsites lay deeply buried along the first terrace of the Little Tennessee River, geomorphological studies suggest that this landform was probably too unstable for

settlement prior to the Early Archaic period (Delcourt 1980). In the absence of any identified Paleo-Indian sites on older terraces or within the uplands, it is likely that the study area was occupied only sporadically during this time period.

Early Archaic Period (8,500-6,000 B.C.)

Six Early Archaic temporal units have been defined by Kimball (1985); five of these are designated as phases. As with the Paleo-Indian period, the earliest Archaic occupation (ca. 8,500-8,000 B.C.) of the study area probably was sporadic, and is recognized only by the occurrence of a small number of Dalton type projectile points. The five remaining Early Archaic phases are defined primarily by distinctive projectile point types and have been documented in deeply stratified contexts at the Rose Island, Icehouse Bottom, Bacon Farm, and Calloway Island sites (Chapman 1975, 1977, 1978, 1979).

The first half of the Early Archaic period (8,000-6,800 B.C.) is represented by the Lower Kirk and Upper Kirk phases. Lower Kirk phase strata were observed only at the Icehouse Bottom site (Strata M-O) and contained morphologically distinct variants of the Kirk Corner Notched type (Chapman 1977; Coe 1964). Radiocarbon dates indicate an age of 8,000-7,300 B.C. and make this the earliest cultural context recognized within Tellico Reservoir. Features associated with this occupation included prepared clay hearths, some of which possessed textile and basketry impressions (Chapman and Adovasio 1977). Deeply buried Upper Kirk phase components, containing lithic tool assemblages characterized by formalized end scrapers, side scrapers, bifacial knives, pièces esquillées, pitted cobbles, and late variants of Kirk

Corner Notched, were sampled at Rose Island, Icehouse Bottom, Bacon Farm, Patrick, and Calloway Island. Radiocarbon dates from these sites place this phase between 7,400 B.C. and 6,800 B.C. At Icehouse Bottom, features included hearths, basins, fired areas, globular pits, and surface concentrations of rock. A similar range of features was also observed at other Early Archaic sites.

The latter part of the Early Archaic period (ca. 6,900-5,800 B.C.) is represented by the St. Albans, LeCroy, and Kanawha phases. These phases are marked by the occurrence of distinctive projectile point types with bifurcated bases, a decrease in the use of formalized lithic tools, and an increase in bipolar lithic reduction. Stratified sites where components of these phases were sampled include Rose Island, Icehouse Bottom, Bacon Farm, and Calloway Island (Chapman 1975, 1977, 1978, 1979).

Middle Archaic Period (6,000-3,000 B.C.)

The Middle Archaic period within Tellico Reservoir is marked by the appearance of stemmed projectile points, ground-stone atlatl weights, and chipped-cobble netsinkers, and the use of a greater variety of locally available lithic resources (Chapman 1985a). As with the preceding period, Middle Archaic phases are recognized primarily by differences in projectile point styles.

The Kirk Stemmed (6,000-5,800 B.C.) and Stanly (5,800-5,500 B.C.) phases are represented by morphologically similar points of the Kirk Stemmed/Stanly category. Although components of these phases were recognized at Rose Island, Icehouse Bottom, Bacon Farm, Calloway Island, and Citico, the Howard site excavations provided the best

stratigraphic evidence for establishing their chronological relationship. Aside from minor typological distinctions between Kirk Stemmed and Stanly, the lithic assemblages of these phases differed only with respect to a reduction in frequency of bipolar lithics following the Kirk Stemmed phase (Chapman 1979:82-83). Features associated with these phases were observed at Icehouse Bottom (Stratum D), Howard (Strata VIII-IX), and Bacon Farm (Stratum V), and were similar to those found in Early Archaic contexts.

The Morrow Mountain phase (5,500-5,000 B.C.) is best known within Tellico Reservoir from excavations at the Howard (Stratum VII) and Icehouse Bottom (Strata B-C) sites (Chapman 1977, 1979). This phase is characterized by assemblages containing Morrow Mountain I and II projectile points, mostly ad hoc chipped-stone tools, and debitage reflecting largely hard-hammer bifacial reduction. Excavated features included hearths, basins, small pits, fired areas, and surface concentrations of rocks. This latter category was much more common than at earlier sites.

The latter part of the Middle Archaic period (ca. 5,000-3,000 B.C.) is represented only by the sporadic occurrence of Guilford, Sykes, and possibly Halifax type projectile points. The ubiquity of Sykes points within surface collections suggests that they may reflect an unsampled Sykes phase occupation within the study area. If so, then a shift in settlement pattern following the Morrow Mountain phase may be indicated since no Sykes components were observed in stratified contexts overlying earlier Middle Archaic strata (Chapman 1985a:149). Conversely, it is also possible that the absence of identified

stratigraphic contexts reflects more complex geomorphological processes that have destroyed much of the archaeological record for the late Middle Archaic period.

Late Archaic Period (3,000-1,000 B.C.)

Two phases--Savannah River and Iddins--are defined for the Late Archaic period within Tellico Reservoir. The earlier and more poorly represented is the Savannah River phase (3,000-1,800 B.C.). This phase was sampled through archaeological excavation only at the Bacon Bend site. Excavation of Stratum 7 at Bacon Bend uncovered several rock-filled basins, or hearths, but no evidence of domestic structures. Lithic artifacts from the site included large Savannah River Stemmed projectile points made of slate and quartzite and a winged atlatl weight fragment. In addition, these investigations produced the earliest evidence for domesticated squash within the lower Little Tennessee River valley. Notched-pebble netsinkers and soapstone bowl fragments, usually common on Late Archaic sites within the study area, were not recovered at Bacon Bend (Chapman 1981).

The Iddins phase (1,800-1,200 B.C.) was sampled through excavations at the Harrison Branch, Patrick, and Iddins sites (Chapman 1981; Schroedl 1975, 1978b). Stratum III at the Iddins site was the best sampled context for this phase and revealed a linear concentration of rock-filled hearths along the front edge of the first terrace. Artifacts recovered from these excavations included Iddins Undifferentiated Stemmed points, numerous notched-pebble netsinkers, grooved axe fragments, and fragments of carved soapstone bowls.

Early Woodland Period (1,000-200 B.C.)

The Early Woodland occupation of the study area is represented by the Watts Bar phase. Components of this phase were best sampled at the Bacon Bend site (Salo 1969) and beneath the Early Mississippian occupations at the Martin Farm site (Schroedl et al. 1985). Ceramic evidence also suggest the presence of Watts Bar components at Rose Island, Calloway Island, and Patrick (Chapman 1975, 1979; Schroedl 1978b). These components contained crushed-quartz-tempered cord-marked and fabric-marked pottery of the Watts Bar series (Lewis and Kneberg 1957) representing large conical cooking vessels. Excavations at both Bacon Bend and Martin Farm were too limited to provide any additional observations about this phase.

Middle Woodland Period (200 B.C.-A.D. 600)

Two Middle Woodland phases--Patrick and Icehouse Bottom--are recognized. The Patrick phase (200 B.C.-A.D. 350) was best sampled by excavations at the Patrick site (Schroedl 1978b), but was also well represented in excavated remains from Rose Island and Calloway Island (Chapman 1975, 1979). At the Patrick site, two separate components were identified. The earlier component, Component 4, possessed a ceramic assemblage consisting almost exclusively of limestone-tempered fabric-marked sherds (>90%), and contained a lithic assemblage including large triangular projectile points, blanks, preforms, pièces esquillées, ground-stone celts, and gorgets. Features observed at the Patrick and Calloway Island sites included both deep and shallow pits, basins, hearths, and flexed burials in circular to oval pits. Grave goods, when present, consisted of steatite gorgets, biconical steatite

tubes, and tubular pipes. While the presence of numerous postholes indicate the construction of structures, no clear alignments were detected. Early Patrick phase components have been previously assigned to the Long Branch phase (McCollough and Faulkner 1973; see Chapman 1975, 1979; Schroedl 1978b).

A second Patrick phase component, Component 3, was also sampled at the Patrick site. This component possessed a more varied ceramic assemblage comprised largely of limestone-tempered fabric-marked (40%), check-stamped (22%), and plain (10%) sherds. Lithic artifacts and features were similar to those observed in Component 4. Schroedl (1978b) correlated this component with Kneberg's (1961) Candy Creek phase.

The latter half of the Middle Woodland period, during which time interaction increased significantly with adjacent regions, is represented by the Icehouse Bottom phase (A.D. 350-600). Both Chapman (1973) and Cridlebaugh (1981) have identified this culture unit as the Candy Creek-Connestee phase. This phase was well represented at the Icehouse Bottom site (Stratum II). The ceramic assemblage from this site contained limestone-tempered plain, simple-stamped, brushed, and cord-marked pottery (e.g., Candy Creek series) as well as sand-tempered plain, simple-stamped, and brushed pottery of the Connestee series. In addition, Swift Creek Complicated Stamped (Jennings and Fairbanks 1939) sherds and a small number of Hopewellian sherds classified as Chillicothe Rocker-Stamped (Prufer 1968) were also present in the assemblage. Other Hopewellian artifacts recovered from Icehouse Bottom include small prismatic blades made of Flint Ridge

chert (Chapman 1973). The role of this site within interaction spheres involving Ohio Hopewell and Middle Woodland peoples in western North Carolina has been discussed by Chapman and Keel (1979).

Although numerous postholes were documented at the Icehouse Bottom site, no structures were defined. Features consisted of straight-sided pits, globular pits, rock-filled pits, and basins. The absence of human burials indicates a different mortuary pattern from that documented for the Patrick phase. Recent excavations at the Kittrell Mound adjacent to Tellico Lake suggest that Icehouse Bottom phase mortuary practices may have involved burial within small stone mounds (Jefferson Chapman, personal communication 1985).

Characterization of the period following the Icehouse Bottom phase (ca. A.D. 600-900) is somewhat problematic due to an almost total lack of data. The best evidence for a Woodland occupation within the lower Little Tennessee River valley during this period consists of a single feature (Feature 80) from Jones Ferry, radiocarbon dated to A.D. 722±140 (Schroedl et al. 1985); however, this date appears to be too early for this feature. The ceramic assemblage from Feature 80, while lacking shell-tempered pottery, was very similar to Early Mississippian pottery from the Martin Farm site in terms of overall assemblage composition and specific attributes of vessel morphology and surface treatment. In addition, a second feature (Feature 20) was also excavated at Jones Ferry which contained similar pottery and a small number of shell-tempered sherds. As a consequence, the occupation represented by these features has been tentatively placed into the Martin Farm phase (despite its apparent

early date). While the designation of a Late Woodland culture unit intermediate to the Icehouse Bottom and Martin Farm phases may prove to be more appropriate (see Schroedl et al. n.d.), more information will need to be obtained before this can be determined.

Early Mississippian Period (A.D. 900-1300)

The Early Mississippian period is represented by two cultural phases. The earlier Martin Farm phase (A.D. 900-1000) was first recognized at the Martin Farm site where it was described as "emergent" Mississippian (Salo 1969). This phase represents an *in situ* development of the Mississippian cultural expression within the study area, brought about by a complex set of factors effecting the indigenous economic base and social institutions (Schroedl et al. n.d.). Specifically, there is firm evidence for greater reliance upon maize agriculture (probably of only minor importance in Woodland economies), and increased residential site size and complexity suggest socio-political patterns not previously manifested in the archaeological record.

The material manifestations of the Martin Farm phase include the construction of platform mounds, rectangular houses of both wall-trench and single-post construction, and the development of a ceramic technology with both shell-tempered and limestone-tempered pottery possessing plain and cord-marked surfaces. Vessels are of a globular form and several have loop handles.

The general paucity of burials at Martin Farm and Hiwassee Island phase components indicates a mortuary pattern that was spatially separate from habitation sites. It is likely that some, if not most,

of the numerous conical burial mounds identified in the study area (Thomas 1894) are associated with these phases. Indeed, such an interpretation is consistent both with Schroedl's (1978a) re-evaluation of the Hamilton burial mound complex and a single radiocarbon date of A.D. 1111±119 obtained from the Pate Mound (40MR16) about two miles downstream from the Martin Farm site (Davis et al. 1982).

The subsequent Hiwassee Island phase (A.D. 1000-1300) represents simply an elaboration of this cultural pattern. Habitation sites became more numerous and some became disproportionately larger, reflecting both an expansion of the local population and greater socio-political complexity. Technologies, however, remained generally stable with the most evident difference being in the manufacture of pottery. Ceramic types became almost exclusively shell tempered and there was an elaboration of vessel forms including globular jars, hemispherical bowls, and salt pans. One particularly distinctive trait of this phase was the use of a red pigment to paint the exterior of some vessels. Lithic technologies are virtually indistinguishable for these two phases, with small triangular projectile points dominating the stone tool assemblages.

Late Mississippian Period (A.D. 1300-1600)

The archaeological record of the Late Mississippian Dallas phase (A.D. 1300-1600) was clearly the most visible of all phases represented in the lower Little Tennessee River valley. The largest sites (e.g., Citico, Toqua, and Bussell Island) each covered several acres and possessed one or more platform mounds surrounded by a thick,

rich midden representing the architectural remains and domestic refuse of the inhabitants of these compact, nucleated villages. In addition, numerous smaller sites were identified throughout the valley. These remains clearly reflect a culture group with a socio-political system on the order of a chiefdom (Service 1962), who possessed a highly efficient economic base supported by intensive maize agriculture.

Extensive excavations of Dallas phase components were conducted by the University of Tennessee at Citico, Toqua, and Tomotley (Guthe and Bistline 1978; Polhemus 1983; Salo 1969); excavations at Bussell Island were conducted by the Tennessee Archaeological Society. These latter investigations, because of inconsistencies in field methods and recorded field observations, produced a data set that has only limited research value (Chapman 1982).

The material record of the Dallas phase, as represented collectively at Toqua and Tomotley, includes: platform mounds and associated plaza; evidence of one or more palisades along the site perimeter; rectangular houses of single-post construction; shell-tempered pottery with mostly plain and cord-marked exteriors, strap and lug handles, and decorations comprised of incising or modeling; and flexed burials in pits, usually accompanied by small pots or other grave offerings. With the exception of Dallas Excurvate triangular projectile points and possibly celts, Dallas lithic assemblages are similar in content to those of the Early Mississippian period.

Historic Period (A.D. 1600-1838)

During the Historic period, the lower Little Tennessee River valley was occupied by the Overhill Cherokee. Their archaeological

remains are represented by the Overhill phase. Although the exact relationship of the Dallas and Overhill phases remains uncertain, it is likely that Dallas played some role in the development of Cherokee (see Dickens 1986). Because Overhill research in the valley focused largely upon known Cherokee towns of the mid-eighteenth century (Williams 1927), little information was obtained for assessing the extent of the Cherokee occupation during the seventeenth century. The tendency for the known Cherokee towns to date slightly later in time as one moves downstream from Citico to Mialoquo (and away from the Cherokee heartland within the Appalachian Summit area) suggests that the seventeenth century archaeological record may be sparse.

The Overhill phase was well sampled during the course of the Tellico Project. Extensive excavations were conducted at Tomotley, Toqua, and Chota-Tanasee (Baden 1983; Polhemus 1983; Schroedl 1982). More limited investigations were conducted at Wear Bend, Citico, Tuskegee, and Mialoquo (Chapman 1980; Chapman and Newman 1979; Guthe and Bistline 1978; Russ and Chapman 1984).

Archaeological manifestations of the Overhill phase, as observed for the mid-eighteenth century, include: structures of vertical-post construction representing summer and winter houses; a large townhouse at major villages; a more dispersed intra-settlement plan (when compared with Dallas) lacking a palisade; a ceramic assemblage comprised largely of shell-tempered plain and carved-paddle stamped pottery, decorated with a filleted applique strip along the rim, and representing globular jars, bowls, and pans; the minor occurrence of

grit-tempered Qualla series pottery; and the ubiquitous occurrence of Euroamerican trade goods.

After the end of the nineteenth century, the Overhill phase occupation consisted mostly of small groups of families living at previous townsites and as scattered communities along the major southern tributaries of the lower Little Tennessee River. One such site (N28) was tested along the Tellico River at the southern end of the study area (Davis et al. 1982).

LITHIC ARTIFACTS

Introduction

Lithic artifacts used as chronological indicators within the study area include projectile points, other selected chipped-stone and ground-stone tools and ornaments, bifacial reduction debitage, and blades. Criteria used to identify and interpret the cultural associations of these artifacts follow detailed attribute analyses of Tellico lithic assemblages conducted by Kimball (1978, 1982, 1985). Whereas most lithic artifacts within the first two categories are associated with specific cultural phases, bifacial debitage and blades are only classifiable within broadly defined time periods. This is because the temporal variability within these artifact groups is due largely to gradual shifts in projectile point technology and blade manufacture rather than to a succession of culturally specific tool styles.

Projectile Points

Twenty-eight separate projectile point types, including one Paleo-Indian, 15 Archaic, five Woodland, and seven Mississippian, are recognized within the study area (see Kimball 1985). These types are defined by significant, recurrent associations of key attributes and most are existing types that were defined by archaeological investigations in regions adjacent to the lower Little Tennessee River valley. These types are defined below and discussed in terms of their known distributions and cultural associations (see Table 9).

Clovis Fluted (Kneberg 1956). This projectile point type has a fluted lanceolate form and dates to the Paleo-Indian period (ca. 11,000-8,500 B.C.). Clovis Fluted points are rare within the study area.

Dalton (DeJarnette et al. 1962). Dalton projectile points are characterized by an incurvate base with pronounced basal thinning. Lateral edges are often recurvate, resulting from re-sharpening. This type represents a transitional form from earlier lanceolate types of the Paleo-Indian period to corner-notched types of the Early Archaic period. Dalton points were only infrequently recovered by archaeological investigations in the study area. Chapman (1985a) has suggested an 8,500-8,000 B.C. age for this type within Tellico Reservoir.

Lower Kirk Corner Notched (Chapman 1977; Kimball 1985). This type is defined by an overall triangular form, an excurvate base exhibiting edge grinding, and deep corner notches. Projectile points of this type were observed in the deepest Early Archaic strata at

Table 9. Cultural association of projectile point types (after Kimball 1985).

Time Period	Phase	Projectile Point Type
PALEO-INDIAN		
	Undesignated	Clovis Fluted
EARLY ARCHAIC		
	Undesignated	Dalton
	Lower Kirk	Lower Kirk Corner Notched
	Upper Kirk	Upper Kirk Corner Notched
		Decatur
	St. Albans	St. Albans Side Notched
	LeCroy	LeCroy Bifurcated Stem
	Kanawha	Kanawha Stemmed
MIDDLE ARCHAIC		
	Kirk Stemmed	Kirk Stemmed/Stanly Stemmed
	Stanly	Kirk Stemmed/Stanly Stemmed
	Morrow Mountain	Morrow Mountain I
		Morrow Mountain II
	Undesignated	Guilford Lanceolate
	Undesignated	Halifax Side-Notched
	Undesignated	Sykes
LATE ARCHAIC		
	Savannah River	Savannah River Stemmed
	Iddins	Iddins Undifferentiated Stemmed
EARLY WOODLAND		
	Watts Bar	-
MIDDLE WOODLAND		
	Patrick	Camp Creek
		Greeneville
		Nolichucky
	Icehouse Bottom	Connestee Triangular
		Bradley Spike
EARLY MISSISSIPPIAN		
	Martin Farm	Hamilton Incurvate
	Hiwassee Island	Hamilton Incurvate
LATE MISSISSIPPIAN		
	Dallas	Dallas Excurvate
HISTORIC		
	Overhill	-
MISSISSIPPIAN/ HISTORIC (GENERAL)		Madison
		Straight Base, Incurvate Blade Triangular
		Incurvate Base, Straight Blade Triangular
		South Appalachian Pentagonal Corner-Notched Triangular

Icehouse Bottom, beneath strata containing Upper Kirk Corner Notched points, where they were radiocarbon dated to ca. 8,000-7,300 B.C. (Chapman 1977, 1985a).

Upper Kirk Corner Notched (Chapman 1977; Kimball 1985). This type is defined by an overall triangular form, a straight to incurvate base (with or without basal grinding), and corner notches. This was the predominant projectile point type within Upper Kirk phase assemblages at the Rose Island, Icehouse Bottom, Patrick, Bacon Farm, and Calloway Island sites (Chapman 1975, 1977, 1978, 1979), and dates to 7,400-6,800 B.C. (Chapman 1985a).

Decatur (Cambron and Hulse 1964:87). The Decatur type is defined by a triangular form, corner notches, and a blunted base produced by burination. Decatur points occur only rarely within the study area where they are associated with the Upper Kirk phase (Kimball 1985). An age of 7,400-6,800 B.C. is indicated.

St. Albans Side Notched (Broyles 1966, 1971). This type is the earliest, well-represented projectile point form of the Early Archaic Bifurcate Point Tradition recognized within the Tellico Reservoir (Chapman 1985a). It is defined by side to corner notches and a bifurcated base, and is the predominant point type within St. Albans phase (6,900-6,500 B.C.) components at Rose Island, Icehouse Bottom, and Bacon Farm (Chapman 1975, 1977, 1978).

LeCroy Bifurcated Stem (Kneberg 1956). This type is defined by a straight, parallel-sided stem that has been deeply notched at the base. LeCroy Bifurcated Stem points are diagnostic of the Early Archaic LeCroy phase (6,500-5,800 B.C.) within Tellico Reservoir and

were recovered in stratified context at the Rose Island, Icehouse Bottom, Patrick, Bacon Farm, and Calloway Island sites (Chapman 1975, 1977, 1978, 1979).

Kanawha Stemmed (Broyles, 1966, 1971). This projectile point type is defined by a straight to slightly expanded stem that has been notched at the base. Kanawha Stemmed was the predominant point type within the Early Archaic Kanawha phase (6,100-5,800 B.C.) assemblages excavated from Rose Island, Icehouse Bottom, Patrick, and Bacon Farm (Chapman 1975, 1977, 1978).

Kirk Stemmed/Stanly Stemmed (Chapman 1979; Coe 1964). This category encompasses two separate projectile point types that are defined by a straight to incurvate base and a straight, parallel-sided stem. The combining of these types follows Kimball (1985). This point category was associated with excavated components of the Kirk Stemmed phase (6,000-5,800 B.C.) at Rose Island, Bacon Farm, Howard, Calloway Island, and Citico (Chapman 1975, 1978, 1979; Chapman and Newman 1979), and with excavated components of the Stanly phase (5,800-5,500 B.C.) at Icehouse Bottom, Howard, Calloway Island, and Citico (Chapman 1977, 1979; Chapman and Newman 1979).

Morrow Mountain I Stemmed (Coe 1964). This type is defined by a triangular form and a rounded, excurvate base. Morrow Mountain I Stemmed projectile points were recovered from Morrow Mountain phase (5,500-5,000 B.C.) strata at the Icehouse Bottom and Howard sites (Chapman 1977, 1979).

Morrow Mountain II Stemmed (Coe 1964). This type is similar in form to the Morrow Mountain I type except for the base which is more

tapered and elongate. Morrow Mountain II Stemmed points were also recovered from excavated Morrow Mountain phase components within the Tellico Reservoir (Chapman 1977, 1979).

Guilford Lanceolate (Coe 1964). The Guilford Lanceolate type is defined by a lanceolate form with excurvate sides and a straight to incurvate base. Projectile points of this type were recovered only as isolated finds within Tellico Reservoir. Coe (1964:44, 118), based upon excavations at the Doerschuk and Gaston sites in North Carolina, has suggested that the Guilford Lanceolate type dates from about 5,000-4,000 B.C.

Halifax Side-Notched (Coe 1964). This type is defined by a thick, elongate form and a straight, side-notched base. Points of this type were rare within Tellico Reservoir. Their stratigraphic position between Guilford and Late Archaic Savannah River strata at the Gaston site indicate a late Middle Archaic temporal association (Coe 1964:118).

Sykes (Lewis and Lewis 1961). This projectile point type is defined by a short expanded stem and a straight to excurvate base, formed by removing small corners at the base. Sykes points were recovered from late Middle Archaic strata at Icehouse Bottom; however, Chapman (1977:30) did not consider them to be typologically distinct from small stemmed points which occurred at later Late Archaic and Early Woodland period sites. Similar artifacts from Layer E at Russell Cave, Alabama (Griffin 1974) and from the Ervin site along the middle Duck River, Tennessee (Hofman 1984) have been radiocarbon dated to the fourth millenium B.C. A late Middle Archaic (4,500-3,000 B.C.)

context is assumed for this type within the lower Little Tennessee River valley.

Savannah River Stemmed (Coe 1964). This type is defined by a straight, parallel-sided stem and a straight base. Savannah River Stemmed projectile points were associated with the Late Archaic Savannah River phase (3,000-1,800 B.C.) occupation at the Bacon Bend site (Chapman 1981).

Iddins Undifferentiated Stemmed (Chapman 1981). This type is defined by a triangular to lanceolate form and a stem that is straight to slightly expanding or contracting, with a straight to slightly incurvate base. This was the predominant projectile point type associated with the Late Archaic Iddins phase (1,800-1,200 B.C.) component at the Iddins site (Chapman 1981). Other excavated Iddins phase components where this type predominated include Harrison Branch (Schroedl 1975) and Patrick (Schroedl 1978b).

Camp Creek (Kneberg 1956). This type is a large triangular projectile point with straight lateral edges and an incurvate base. Within the Tellico Reservoir, Camp Creek points were recovered from early Middle Woodland Patrick phase (200 B.C.-A.D.350) components at the Patrick (Schroedl 1978b), Rose Island (Chapman 1975), and Calloway Island (Chapman 1979) sites.

Greeneville (Kneberg 1957). This type is a large triangular projectile point with excurvate lateral edges and an incurvate base. Greeneville points are associated with Patrick phase components in Tellico Reservoir (see Kimball 1985).

Nolichucky (Kneberg 1957). This type is a large triangular

projectile point with recurvate lateral edges and a straight to incurvate base. Nolichucky points were also recovered from early Middle Woodland Patrick phase components at the Patrick (Schroedl 1978b), Rose Island (Chapman 1975), and Calloway Island (Chapman 1979) sites.

Connestee Triangular (Keel 1976). This type is a medium-sized triangular projectile point with straight to incurvate lateral edges and a straight to slightly excurvate base. This was the predominant projectile point type of the Middle Woodland Icehouse Bottom phase (A.D. 350-600) component at the Icehouse Bottom site (Chapman 1973; Cridlebaugh 1981).

Bradley Spike (Kneberg 1956). This type is defined by a thick, narrow, lanceolate form with a small straight-sided stem and a straight base. Projectile points of this type were recovered from Middle Woodland contexts at the Icehouse Bottom (Chapman 1973; Cridlebaugh 1981) and Patrick (Schroedl 1978b) sites. Kimball (1985) suggests an Icehouse Bottom phase association for this type.

Hamilton Incurvate (Kneberg 1956). This type is a small triangular projectile point with incurvate lateral edges and an incurvate base. Although originally defined as a Late Woodland type, cultural associations within Tellico Reservoir are with the Early Mississippian Martin Farm (A.D. 900-1000) and Hiwassee Island (A.D. 1000-1300) phases (Boyd 1982). Hamilton Incurvate points were a major constituent of Early Mississippian lithic assemblages at the Martin Farm and Jones Ferry sites (Schroedl et al. 1985).

Dallas Excurvate Triangular (Lewis and Kneberg 1946). This type

is a small to medium-sized triangular projectile point with excurvate lateral edges and a straight base. Dallas Excurvate Triangular was the predominant projectile point type associated with the Late Mississippian Dallas phase (A.D. 1300-1600) occupations at Tomotley (Guthe and Bistline 1978) and Toqua (Polhemus 1983).

Madison (Scully 1951). This type is a small triangular projectile point with straight lateral edges and a straight base. This projectile point type is associated with all Mississippian cultural phases within the study area (Kimball 1985).

Straight Base, Incurvate Blade Triangular (see Kimball 1985). This category conforms to Kimball's Category 26 and is defined by a small triangular form with incurvate lateral edges and a straight base. These points have a general Mississippian cultural association.

Incurvate Base, Straight Blade Triangular (see Kimball 1985). This category conforms to Kimball's Category 27 and is defined by a small triangular form with straight lateral edges and an incurvate base. These points have a general Mississippian cultural association.

South Appalachian Pentagonal (Keel 1976). This type is defined by a small size and pentagonal form. A general Mississippian period context is indicated.

Corner-Notched Triangular (see Kimball 1985). This conforms to Kimball's Category 24 and represents a small triangular projectile point form with corner notches. A general Mississippian period context is indicated.

Other Lithic Artifacts

In addition to projectile points, certain other categories of lithic artifacts were useful as temporal indicators. Some of these were diagnostic because of formal/stylistic attributes that can be associated with a particular time period(s) or cultural phase(s) and include: grooved axes (Late Archaic); ground celts (Woodland-Mississippian); ground chisels (Mississippian); atlatl weights (Middle Archaic-Late Archaic); netsinkers (Middle Archaic-early Middle Woodland); soapstone sherds (Late Archaic); drilled bar gorgets (Middle Woodland); and ground stone earspools (Early Mississippian). The basis for using these artifacts as general time indicators has been previously discussed by Kimball (1985).

Two other lithic artifact categories useful in broad temporal recognition of probabilistic survey samples were bifacial debitage and blades. Temporal identification of debitage followed the development by Kimball (1982:205-238) of multivariate classification models for each of four separate bifacial reduction stages (i.e., from initial decortication of a chert nodule to final bifacial thinning). These models were based on data (representing 15 measured attributes) generated from 24 excavated lithic assemblages in Tellico Reservoir, ranging in age from Early Archaic to Historic period, and were successful in predicting whether a sample of debitage resulted from stemmed and large triangular projectile point manufacture (Early: Lower Kirk phase to Patrick phase) or medium to small triangular point manufacture (Late: Icehouse Bottom phase to Overhill phase).

A similar model, based on data from 22 excavated assemblages, was

developed for blades (Kimball 1982:238-243). This model recognized an Early/Late dichotomy, similar to that defined for bifacial debitage, with Early blades being produced largely by a percussion method and Late blades usually produced by a pressure method.

Following the development of these models, Kimball (1982) applied them to the probabilistic survey samples. The resultant artifact classifications were used in the land use study (see Chapter VI) to temporally identify collections from individual sampling units as Early, Late, or Early/Late (i.e., mixed).

CERAMIC ARTIFACTS

Introduction

The determination of ceramic temporal indicators followed an analysis of 72 excavated sherd assemblages of known cultural context. These assemblages (n=39,457 sherds) were selected from 16 sites excavated within Tellico Reservoir between 1967 and 1979. Following artifact identification, six of these assemblages were eliminated because of abnormalities in sherd content suggesting mixture with other temporally distinct assemblages. With three exceptions, all sherd samples contained more than 100 sherds. Eight samples contained more than 1,000 sherds. All sherd samples were chosen from contexts representing general refuse deposits.

Ceramic Database

Sherd assemblages that comprise the ceramic database are summarized in Table 10. These assemblages are further evaluated below by cultural phase.

Table 10. Summary of assemblages analyzed to develop the ceramic temporal variability model.

Site	Assemblage Context	Recovery Method[1]	Screen Size	Sample Size	Phase	Reference
40LD24 (Bat Creek)	Feature 1 (Area B)	ts	-	160	Hiwassee Is.	Schroedl 1975
40LD24 (Bat Creek)	Feature 13	ts	-	413	Hiwassee Is.	Schroedl 1975
40LD24 (Bat Creek)	Feature 18	ts	-	88	Hiwassee Is.	Schroedl 1975
40LD24 (Bat Creek)	Feature 34	ts	-	199	Hiwassee Is.	Schroedl 1975
40LD107 (Wear Bend)	Feature 1	ts/ws	1/4"	189	Overhill	Chapman 1980b
40MR3 (Mialoquo)	Feature 12	ws	1/4"	221	Overhill	Russ & Chapman 1984
40MR3 (Mialoquo)	Feature 27	ws	1/4"	942	Overhill	Russ & Chapman 1984
40MR3 (Mialoquo)	Feature 28	ws	1/4"	292	Overhill	Russ & Chapman 1984
40MR3 (Mialoquo)	Feature 30	ws	1/4"	310	Overhill	Russ & Chapman 1984
40MR3 (Mialoquo)	Feature 34	ws	1/4"	656	Overhill	Russ & Chapman 1984
40MR3 (Mialoquo)	Feature 49	ws	1/4"	271	Overhill	Russ & Chapman 1984
40MR3 (Mialoquo)	Feature 57	ws	1/4"	168	Overhill	Russ & Chapman 1984
40MR3 (Mialoquo)	Feature 62	ws	1/4"	932	Overhill	Russ & Chapman 1984
40MR5 (Tomotley)	Feature 6	ws	1/4"	109	Dallas	Guthe & Bistline 1978
40MR5 (Tomotley)	Feature 71	ws	1/4"	203	Dallas(?)	Guthe & Bistline 1978
40MR5 (Tomotley)	Feature 194	ws	1/4"	141	Dallas(?)	Guthe & Bistline 1978
40MR5 (Tomotley)	Feature 269	ws	1/4"	286	Martin Farm	Guthe & Bistline 1978
40MR6 (Toqua)	Feature 92	ws	1/4"	341	Dallas	Polhemus 1983
40MR6 (Toqua)	Feature 129	ws	1/4"	387	Dallas	Polhemus 1983
40MR6 (Toqua)	Feature 192	ws	1/4"	221	Dallas	Polhemus 1983
40MR6 (Toqua)	Structure 37	ts	-	521	Dallas	Polhemus 1983
40MR6 (Toqua)	Sq.1120-30L70-80, L.1	ts	-	620	Dallas	Polhemus 1983
40MR6 (Toqua)	Sq.1120-30L70-80, L.2	ts	-	609	Dallas	Polhemus 1983
40MR7 (Citico)	Feature 22	ts	-	190	Overhill	Salo 1969
40MR7 (Citico)	Feature 23	ts	-	158	Dallas	Salo 1969
40MR7 (Citico)	Feature 40	ts	-	183	Overhill	Salo 1969
40MR7 (Citico)	Feature 43	ts	-	220	Dallas	Salo 1969
40MR7 (Citico)	Feature 44	ts	-	858	Overhill(?)	Salo 1969
40MR7 (Citico)	Feature 45	ts	-	692	Overhill	Salo 1969
40MR7 (Citico)	Feature 47	ts	-	1103	Overhill	Salo 1969
40MR7 (Citico)	Feature 56	ts	-	541	Overhill(?)	Salo 1969
40MR7 (Citico)	Feature 184	ws	1/4"	221	Overhill	Chapman 1979
40MR7 (Citico)	Feature 290	ws	1/4"	1067	Overhill	Chapman 1979
40MR7 (Citico)	Feature 293	ws	1/4"	513	Overhill	Chapman 1979
40MR20 (Martin Farm)	Fea. 7 (Watts Bar)	ws	1/4"	327	Watts Bar	Schroedl et al. 1985
40MR20 (Martin Farm)	Fea. 7 (Martin Farm)	ws	1/4"	1128	Martin Farm	Schroedl et al. 1985
40MR20 (Martin Farm)	Feature 25	ts	-	68	Watts Bar	Salo 1969
40MR20 (Martin Farm)	Feature 57	ws	1/4"	300	Hiwassee Is.	Schroedl et al. 1985
40MR20 (Martin Farm)	Feature 64	ws	1/4"	1095	Hiwassee Is.	Schroedl et al. 1985
40MR20 (Martin Farm)	Feature 66	ws	1/4"	204	Hiwassee Is.	Schroedl et al. 1985
40MR20 (Martin Farm)	Feature 69	ws	1/4"	236	Hiwassee Is.	Schroedl et al. 1985
40MR20 (Martin Farm)	Structure 3	ws	1/4"	353	Martin Farm	Schroedl et al. 1985
40MR20 (Martin Farm)	Structure 11	ws	1/4"	453	Hiwassee Is.	Schroedl et al. 1985
40MR20 (Martin Farm)	Block II, L.2	ws	1/4"	827	Hiwassee Is.	Schroedl et al. 1985
40MR23 (Icehouse Bottom)	Feature 68	ds	1/2"	129	Icehouse Bottom	Chapman 1973
40MR23 (Icehouse Bottom)	Feature 86	ds	1/2"	267	Icehouse Bottom	Chapman 1973
40MR23 (Icehouse Bottom)	Feature 87	ds	1/2"	179	Icehouse Bottom	Chapman 1973
40MR23 (Icehouse Bottom)	Feature 607	ws	1/4"	408	Icehouse Bottom	Cridlebaugh 1981
40MR23 (Icehouse Bottom)	Sq.110R130,Str.2 Fea.	ws	1/4"	195	Icehouse Bottom	Cridlebaugh 1981
40MR23 (Icehouse Bottom)	Sq.110R130, L.2	ws	1/4"	726	Icehouse Bottom	Cridlebaugh 1981
40MR23 (Icehouse Bottom)	Sq.110R130, L.3	ws	1/4"	988	Icehouse Bottom	Cridlebaugh 1981
40MR23 (Icehouse Bottom)	Sq.100R130, L.4	ts	-	943	Icehouse Bottom	Chapman 1973
40MR25 (Bacon Bend)	Stratum 5	ts	-	1379	Watts Bar	Salo 1979
40MR27 (Mayfield II)	Feature 3	ts	-	390	Hiwassee Is.	Salo 1969
40MR40 (Patrick)	Feature 2	ws	1/4"	105	Patrick	Schroedl 1978b
40MR40 (Patrick)	Feature 3	ws	1/4"	216	Patrick	Schroedl 1978b
40MR40 (Patrick)	Feature 41	ws	1/4"	119	Patrick	Schroedl 1978b
40MR40 (Patrick)	Feature 86	ws	1/4"	151	Patrick	Schroedl 1978b
40MR40 (Patrick)	Feature 103	ws	1/4"	77	Patrick	Schroedl 1978b
40MR40 (Patrick)	Block 3, L.3	ws	1/4"	203	Patrick	Schroedl 1978b
40MR41 (Calloway Island)	Feature 97	ws	1/4"	137	Patrick	Chapman 1979
40MR41 (Calloway Island)	Feature 170	ws	1/4"	126	Patrick	Chapman 1979
40MR41 (Calloway Island)	Feature 190	ws	1/4"	240	Patrick	Chapman 1979
40MR44 (Rose Island)	Sq.150R300, L.3	ws	1/4"	166	Watts Bar	Chapman 1975
40MR44 (Rose Island)	Sq.110R300, L.3	ws	1/4"	469	Patrick(?)	Chapman 1975
40MR44 (Rose Island)	Sq.190R300, L.3	ws	1/4"	165	Patrick(?)	Chapman 1975
40MR44 (Rose Island)	Sq.150R300, L.4	ws	1/4"	129	Watts Bar	Chapman 1975
40MR62 (Tanasssee)	Feature 95	ts	-	421	Overhill	Schroedl 1982
40MR76 (Jones Ferry)	Feature 13	ws	1/4"	125	Overhill	Chapman 1980
40MR76 (Jones Ferry)	Feature 20	ws	1/4"	6462	Martin Farm	Chapman 1980
40MR76 (Jones Ferry)	Feature 40	ws	1/4"	1490	Icehouse Bottom	Chapman 1980
40MR76 (Jones Ferry)	Feature 80	ws	1/4"	4036	Martin Farm	Chapman 1980

[1] ts-trowel sorted; ws-waterscreened; ds-dry screened.

Watts Bar Phase. Five sherd samples (n=2,069 sherds) were analyzed from the Early Woodland Watts Bar phase. Samples were selected from Martin Farm (40MR20), Bacon Bend (40MR25), and Rose Island (40MR44). Bacon Bend was the only site where the primary emphasis of investigation was placed upon Early Woodland archaeological deposits. Excavations of Watts Bar phase deposits at the other two sites were also very limited in extent. The analyzed sherd samples represent two feature and three midden depositional contexts.

Patrick Phase. Eleven sherd samples (n=2,008 sherds) were chosen from the early Middle Woodland Patrick phase. Samples were taken from the Patrick (40MR40), Calloway Island (40MR41), and Rose Island (40MR44) sites, and include eight feature and three midden depositional contexts. The two midden samples from Rose Island were contaminated with earlier Watts Bar material and consequently were omitted from the analysis. The remainder of the samples appeared to be derived from uncontaminated contexts, and all were recovered by waterscreening.

Icehouse Bottom Phase. Nine samples (n=5,325 sherds) were selected from the Middle Woodland Icehouse Bottom phase. These samples include five features, one feature cluster, and three excavation units within midden deposits. One feature sample was selected from the Jones Ferry site (40MR76); the remainder of the samples were from the Icehouse Bottom site (40MR23). Artifact recovery techniques varied between samples with three samples being dry-screened through 1/2-inch mesh and one sample being trowel-sorted. The remaining samples were waterscreened through 1/4-inch mesh. The

effects of differential recovery techniques are evaluated during analysis.

Martin Farm Phase. Five samples (n=12,265 sherds) were chosen from the Early Mississippian Martin Farm phase. Samples from two large features were taken from Jones Ferry (40MR76), and samples from a feature and a structure were selected from Martin Farm (40MR20). In addition, a sherd sample was selected from an isolated Martin Farm phase feature situated on the first terrace at Tomotley (40MR5). All of these samples were recovered by waterscreening through 1/4-inch mesh. Although the Feature 80 sherd assemblage from the Jones Ferry site does not contain any shell-tempered sherds and therefore does not conform to the traditional definition of Mississippian period ceramics, it was included within the Martin Farm phase sample since all other aspects of the assemblage (i.e., stylistic content) suggest such a placement. Feature 80 is interpreted as representing the starting point of a relatively short period during which crushed limestone was replaced by crushed shell as the dominant tempering agent. The co-occurrence of these two types of temper define Kimball and Baden's (1985) Mississippian I temporal unit. This definition is modified slightly here to include Feature 80. No other ceramic assemblages similar to this feature have been reported from Tellico Reservoir.

Hiwassee Island Phase. Eleven sherd samples (n=4,365 sherds) were selected from three excavated sites including Bat Creek (40LD24), Martin Farm (40MR20), and Mayfield II (40MR27). Hiwassee Island samples represent feature, structure, and midden contexts. The

majority of these sherd samples (n=6) were selected from the Martin Farm site and were retrieved by waterscreening through 1/4-inch mesh. Four sherd samples were taken from Bat Creek while only one came from Mayfield II. These samples were recovered by trowel-sorting. Previous analyses (Schroedl 1975; Schroedl et al. 1985) suggest that the Martin Farm assemblages are slightly earlier than those from Bat Creek.

Dallas Phase. Eleven sherd samples (n=3,530 sherds) were selected from the Dallas phase. Samples were taken from Tomotley (40MR5; n=3), Toqua (40MR6; n=6), and Citico (40MR7; n=2). Six samples were recovered by waterscreening through 1/4-inch mesh; the remainder were trowel-sorted. Samples include midden, structure, and feature contexts. These three sites represent the major Late Mississippian Dallas sites excavated within Tellico Reservoir by The University of Tennessee.

Overhill Phase. Although this phase may span over 200 years, only sites that date to the latter half of the 18th century are well represented by archaeological excavations. Twenty sherd samples (n=9,895 sherds) were selected from Overhill Cherokee contexts at five excavated sites. These sites include: Wear Bend (40LD107), Mialoquo (40MR3), Citico (40MR7), Tanasee (40MR62), and Jones Ferry (40MR76). All of these samples represent feature contexts. Six of the eight samples from Citico and the one sample from Tanasee were recovered by trowel-sorting. In addition, half of the Wear Bend sample (Feature 1) was trowel sorted. The remaining samples were waterscreened through 1/4-inch mesh. The Overhill phase sherd samples were selected to

provide an adequate representation of the ceramic diversity previously observed in historic Cherokee assemblages (see Baden 1981; Bates 1982; Earnest 1971; King 1972).

Attribute Dimensions

Analysis of sherd assemblages considered four separate attributes: paste, surface treatment, vessel portion, and size. These attributes and their associated attribute states are described below.

Paste. Analysis of paste focused upon a single component--temper. Ceramic temper consists of aplastic inclusions added to the potter's clay prior to firing in order to facilitate uniform drying and to reduce shrinkage (Shepard 1974). It has long been recognized as a temporally sensitive attribute within pottery assemblages of the Southeast. In fact, temper (along with surface treatment) has been used almost universally in this region as a key attribute in defining sherd typologies. Nine discrete attribute states for paste are recognized in the present analysis and are defined below. These attribute states are generally compatible with those defined by Kimball and Baden (1985).

Coarse Crushed Quartz (CQ). Paste contains coarse particles of angular crushed quartz, generally >3 mm in diameter. Smaller particles of crushed quartz and sand also may be present. Pastes tempered with coarse crushed quartz are referable to Watts Bar sherd types (Lewis and Kneberg 1957). Watts Bar ceramics are diagnostic of the Early Woodland period within Tellico Reservoir (Kimball 1985; Schroedl et al. 1985).

Medium Crushed Quartz (MQ). Paste contains medium-sized

(1-3 mm diameter) particles of angular crushed quartz. While most particles are of uniform size, both larger and smaller particles of crushed quartz and sand may occur in small amounts. Medium crushed quartz temper is not attributable to any sherd type presently recognized within Tellico Reservoir. This paste category may represent either a local equivalent of the early Middle Woodland Pigeon series (Keel 1976) in western North Carolina or a variant of Watts Bar.

Sand/Fine Crushed Quartz (S). Paste contains fine particles of crushed quartz or sorted, water-worn sand measuring <1 mm in diameter. Temper particles are usually of uniform size. Sherds with this paste are largely attributable to the late Middle Woodland Connestee series (Keel 1976) which occurs within the Icehouse Bottom phase in Tellico Reservoir (Chapman 1973). Other sand-tempered sherds that may represent imported vessels have also been observed within Mississippian contexts (Schroedl et al. 1985).

Grit/Very Coarse Sand (G). Paste contains medium-sized particles of unsorted coarse sand or "grit" measuring 1-2 mm in diameter. Temper particles usually are water-rounded and therefore distinguishable from crushed quartz tempers. Grit-tempered sherds within Tellico Reservoir are largely attributable to the historic Cherokee Qualla series (Egloff 1967).

Crushed Limestone (L). Paste contains particles of angular, crushed limestone. Temper particles often are leached from sherds, leaving angular holes, and range from 0.5-2.5 mm in diameter. In the Tellico study area, crushed limestone is a predominant temper type

during the Patrick, Icehouse Bottom, and Martin Farm phases (Kimball 1985; Schroedl et al. 1985).

Crushed Shell (SH). Paste contains particles of crushed, fresh-water mussel shell. Particle size and shape are variable. Most temper particles consist of flat shell platelets; however, angular shell fragments resembling crushed limestone also occur. As with crushed limestone-tempered pastes, shell particles may be leached due to soil acidity, leaving flat plate-like cavities. Crushed shell-tempered pastes generally are considered diagnostic of the Mississippian period throughout the eastern United States (Griffin 1965) and occur within a similar context in Tellico Reservoir (Kimball 1985).

Mixed Temper (M). Paste contains a mixture of crushed shell and other temper particles, including fired clay, grit, or sand. Sherds with this paste have been recovered from historic Cherokee contexts at Chota (Bates 1982; Earnest 1971) and may also be associated with earlier Mississippian phases.

Crushed Shell-Limestone (SL). Paste contains a mixture of crushed shell and limestone particles with a generally greater proportion of shell. This paste category has been recognized only at Martin Farm (40MR20) and Jones Ferry (40MR76) where it is associated with components of the Martin Farm phase (Salo 1969; Schroedl et al. 1985).

Medium Crushed Quartz-Limestone (MQL). Paste contains a mixture of medium crushed quartz and angular crushed limestone particles, with limestone being the dominant constituent. Although

the exact temporal position of this paste category is uncertain, a Patrick phase association appears likely.

Vessel Portion. Vessel portion was measured by seven discrete attribute states which specify the portion or portions of a ceramic vessel represented by a sherd (see Baden 1982a). Three major vessel sections are recognized and include rim, neck, and body (Figure 10). Rim is defined by the presence of a finished edge or lip on a sherd. Neck is defined by the presence of a sherd curvature (i.e., concave exterior surface) suggesting vessel wall constriction. Body is defined by the presence of sherd curvature (i.e., convex exterior surface) suggesting a non-rim and non-neck vessel portion. All sherds with indeterminate vessel portion were also classified as body sherds. The seven possible attribute states for vessel portion include: Rim, Neck, Body, Rim-Neck, Rim-Body, Neck-Body, and Rim-Neck-Body. The presence of a rim-neck combination defines a jar vessel form whereas a rim-body combination defines a bowl form.

Surface Treatment. Surface treatment, including surface finish, surface decoration, and appendages, was measured separately for each vessel portion represented on a sherd. In instances where multiple surface treatments were present on a single vessel portion, decoration and appendages were given priority in attribute classification. Twenty-seven surface treatment attribute states recognized in the present analysis are defined below.

Plain (P). Exterior surface has been smoothed or burnished, producing a plain surface finish. Plain, eroded surfaces were excluded from this treatment category.

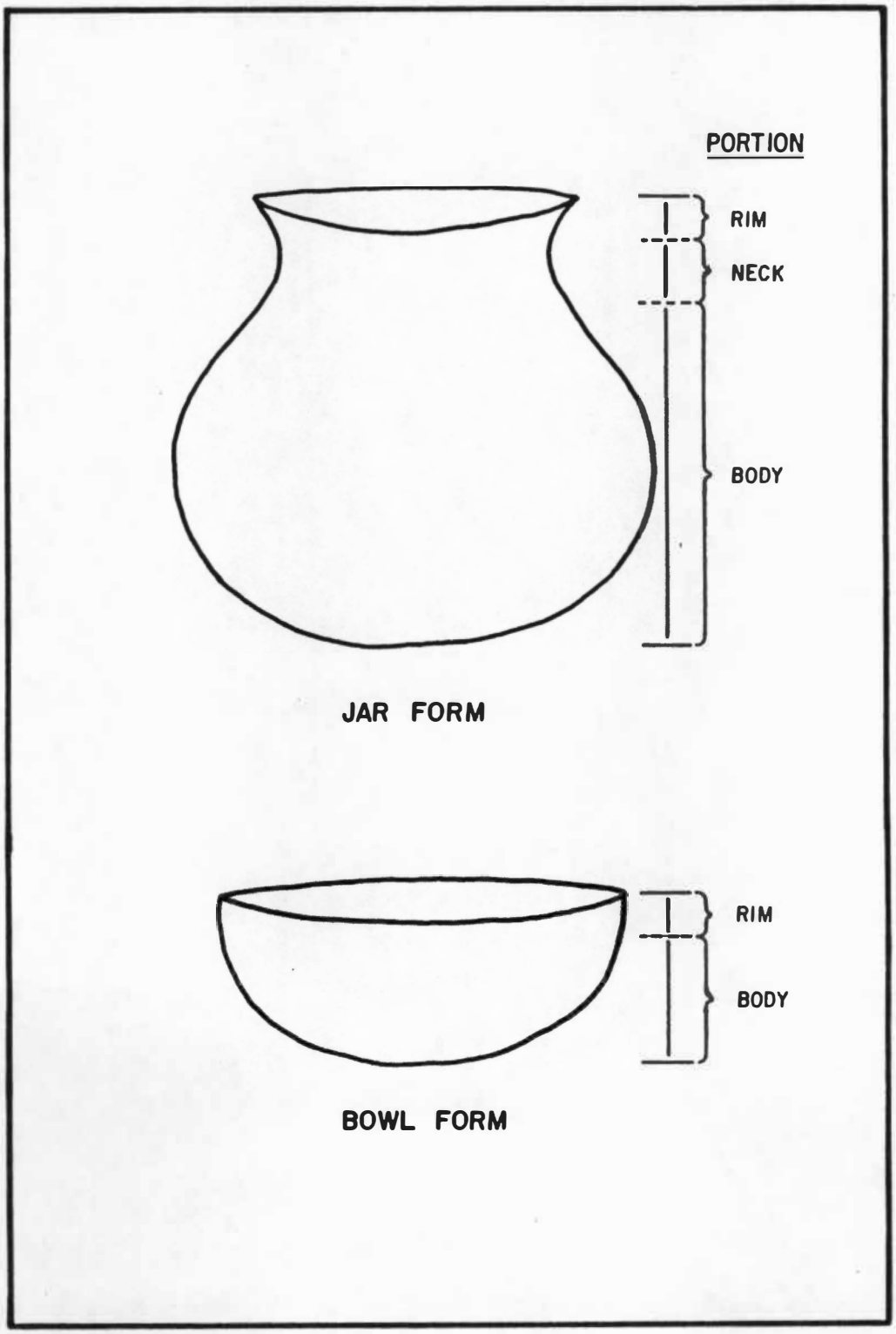


Figure 10. Definition of vessel portions on jar and bowl forms.

Cordmarked - S Twisted (CMS). Exterior surface has been impressed by a paddle wrapped with S-twisted cordage (see Hurley 1979 for a discussion of cordage terminology).

Cordmarked - Z Twisted (CMZ). Exterior surface has been impressed by a paddle wrapped with Z-twisted cordage.

Cordmarked - Indeterminate (CM). Exterior surface has been impressed with a cord-wrapped paddle with indeterminate cordage twist. Cordmarked surfaces occur in varying frequencies within almost all Woodland and Mississippian phases in the Tellico Reservoir.

Fabric Marked (FM). Exterior surface has been impressed with a simple-twined or plaited fabric. Open-twined and plaited fabric-marked surfaces are restricted to the Mississippian period where they occur exclusively on "salt pan" vessels. Close-twined, fabric-marked surfaces are common on Watts Bar and Patrick phase sherds, and occur rarely on Martin Farm and Hiwassee Island phase "salt pan" sherds (Schroedl et al. 1985).

Simple Stamped (SS). Exterior surface has been stamped with a carved wooden paddle possessing parallel lands and grooves. Simple-stamped surfaces have been observed in both Woodland and Mississippian period assemblages within Tellico Reservoir.

Check Stamped (CKS). Exterior surface has been stamped with a carved paddle possessing a rectangular grid composed of perpendicularly placed grooves. Check-stamped surfaces have been observed in Patrick, Icehouse Bottom, and Overhill phase assemblages within Tellico Reservoir (Chapman 1973; Kimball and Baden 1985; Schroedl 1978b).

Rectilinear Complicated Stamped - var. Overhill (RCSO). Exterior surface has been stamped with a carved paddle possessing a rectilinear stamp motif associated with Overhill Complicated Stamped (Lewis and Kneberg 1946), a common shell-tempered sherd type within historic Overhill Cherokee ceramic assemblages in Tellico Reservoir (Baden 1983; Bates 1982; Earnest 1971; King 1970).

Rectilinear Complicated Stamped - var. Qualla (RCSQ). Exterior surface has been stamped with a carved paddle possessing a rectilinear stamp motif associated with Qualla Complicated Stamped (Egloff 1967). This surface treatment has been observed on grit-tempered sherds from historic Cherokee contexts at Citico (King 1969), Chota (King 1970), and Tomotley (Baden 1983).

Rectilinear Complicated Stamped - var. Indeterminate (RCSI). Exterior surface has been stamped with a carved paddle possessing an indeterminate rectilinear stamp design.

Curvilinear Complicated Stamped - var. Swift Creek (CCSC). Exterior surface has been stamped with a carved paddle possessing a stamp motif diagnostic of the Swift Creek Complicated Stamped sherd type (Jennings and Fairbanks 1939). This sand-tempered type occurs within a Middle Woodland context at the Icehouse Bottom site (Chapman 1973).

Curvilinear Complicated Stamped - var. Pickwick (CCSP). Exterior surface has been stamped with a carved paddle possessing a curvilinear stamp motif associated with Pickwick Complicated Stamped (Haag 1939). Limestone-tempered sherds with this surface treatment are associated with Icehouse Bottom phase assemblages at Icehouse

Bottom (Chapman 1973) and may also occur within a Patrick phase context at the Patrick site (Schroedl 1978b).

Curvilinear Complicated Stamped - var. Overhill (CCSO). Exterior surface has been stamped with a carved paddle possessing a curvilinear stamp motif associated with Overhill Complicated Stamped (Lewis and Kneberg 1946). This surface treatment occurs on shell-tempered sherds of the Overhill phase in Tellico Reservoir.

Curvilinear Complicated Stamped - var. Qualla (CCSQ). Exterior surface has been stamped with a carved paddle possessing a curvilinear stamp motif associated with Qualla Complicated Stamped (Egloff 1967). This surface treatment occurs on grit-tempered sherds from historic Cherokee contexts in Tellico Reservoir.

Curvilinear Complicated Stamped - var. Indeterminate (CCSI). Exterior surface has been stamped with a carved paddle possessing an indeterminate curvilinear stamp motif.

Brushed (BR). Exterior surface has been scraped or brushed when damp with a twig brush or a sinew-wrapped paddle. Brushed surfaces are common on Icehouse Bottom phase sherds at the Icehouse Bottom site (Chapman 1973).

Cob Marked (COB). Exterior surface has a rough finish, produced with a corn cob after the clay was partially dry. This surface treatment has been reported from historic Overhill Cherokee contexts in Tellico Reservoir and has been classified as Overhill Roughened (King 1970) and Overhill Cob Marked (Polhemus 1968) when found on shell-tempered sherds.

Red Filmed (RF). Exterior surface has been smoothed,

sometimes slipped, and covered with an iron oxide paint. Shell-tempered sherds with this surface decoration usually are classified as Hiwassee Island Red Filmed (Lewis and Kneberg 1946) and occur within the Hiwassee Island phase in Tellico Reservoir.

Red on Buff (ROB). Exterior surface is well smoothed, often with an added slip of ball clay, and possesses a surface decoration comprised of geometric designs painted with iron oxide pigment. This surface treatment is associated with a fine, shell-tempered paste and conforms to the Hiwassee Island Red on Buff sherd type (Lewis and Kneberg 1946), diagnostic of the Hiwassee Island phase.

Incised (I). Exterior surface has been smoothed and decorated (prior to firing) by incising with a sharp, pointed tool. Incising is a dominant mode of decoration during the Mississippian period.

Punctated (PUNCT). Exterior surface has been smoothed and decorated with punctations produced with either a sharp, pointed tool or the end of a hollow reed (not differentiated). Within Tellico Reservoir, punctated surfaces have been reported from both Woodland and Mississippian phases.

Modeled (MOD). Exterior surface has been smoothed and modeled to form either nodes or stylized effigies of anthropomorphic, zoomorphic, or vegetal forms. This decorative technique is most common on shell-tempered ceramics of the Dallas phase (see Lewis and Kneberg 1946).

Rocker Stamped (RS). Exterior surface has been smoothed and decorated with a lightly impressed, rocker-stamped design. This

decorative technique is diagnostic of Hopewell series ceramics in the Ohio Valley (see Chillicothe Rocker-Stamped [Prufer 1965]) and has been reported from a Middle Woodland context at Icehouse Bottom (Chapman 1973).

Filleted Applique (FILAP). Exterior surface has been decorated with a strip or band of clay applied to either the rim or neck and notched with a sharp tool or fingernail. This decorative technique occurs within Dallas and Overhill phase assemblages in Tellico Reservoir and is a key element of Dallas Filleted (Lewis and Kneberg 1946) and Overhill Plain Rim (King 1970, 1977) sherd types, respectively.

Loop Handle (LOOP). Loop handles are generally circular or oval in cross-section and have a width-to-thickness ratio which is $\leq$3.0. This is the predominant handle form within Martin Farm and Hiwassee Island phase assemblages in Tellico Reservoir (Schroedl 1975; Schroedl et al. 1985).

Strap Handle (STRAP). Strap handles are defined as those handles with a width-to-thickness ratio greater than 3.0, and represent the predominant handle form of the Dallas phase.

Lug Handle (LUG). Lugs have been reported from Hiwassee Island and Dallas contexts in Tellico Reservoir.

Size. Finally, all analyzed artifacts were classified by size. Size was measured on an ordinal scale comprised of four attribute states that include: Size 1 (0-2 cm), Size 2 (2-4 cm), Size 3 (4-8 cm), and Size 4 (>8 cm). The size of an individual sherd was determined by its maximum length.

Samples of sherds from each major paste category (i.e., coarse crushed quartz, sand, grit, crushed limestone, and crushed shell) were measured more precisely (by length and width to the nearest 1 mm) to provide estimates of mean sherd surface area for each size class. Summary statistics for these samples are presented in Table 11. Overall size means were then calculated from all paste categories for each size class. Once this was completed, weighting factors were developed that express the relative relationships among the four size classes in terms of sherd surface area (Table 12). The largest class (Size 4) received a weight of 1.0 and all smaller classes were weighted based upon their mean size relative to Size 4. For example, the mean surface area of Size 3 sherds represented 34.07% of the mean surface area for Size 4 sherds. Size weights then were used to transform all sherd counts into estimates of represented surface area.

The rationale behind this approach to data transformation is that analysis of sherd counts may yield biased estimates of sherd assemblage composition, particularly when two or more paste categories are involved which break differentially (Chapman 1973; also see Kimball and Baden [1985] for a discussion and alternate solution to this problem based upon data from the Icehouse Bottom site). In addition, the size composition of sherds within an assemblage is partially a function of the mode of deposition (e.g., accumulation within a midden deposit versus direct disposal into a trash pit); consequently, sherd assemblages derived from different depositional contexts may not be directly comparable. Finally, sherds of different size simply do not represent the same thing. A single sherd can be

Table 11. Summary statistics for sherd surface area by paste category (all measurements are in cm^2).

Paste Category	Size 1 $\bar{x}$	Size 1 s	Size 1 n	Size 2 $\bar{x}$	Size 2 s	Size 2 n	Size 3 $\bar{x}$	Size 3 s	Size 3 n	Size 4 $\bar{x}$	Size 4 s	Size 4 n
Coarse Crushed Quartz	2.28	0.7805	81	6.85	2.7232	55	20.33	8.8689	50	59.39	10.0158	6
Sand	2.06	0.7172	17	5.71	2.1366	23	20.20	9.4036	13	58.92	25.3724	6
Grit	2.22	0.6023	41	5.64	2.3234	49	18.19	7.3356	31	66.72	22.6435	16
Crushed Limestone (Woodland)	1.61	0.6354	57	5.96	2.2262	51	20.58	6.5359	28	-	-	-
Crushed Limestone (Mississippian)	2.98	0.4520	11	6.30	2.3068	50	19.74	9.6889	26	-	-	-
Crushed Shell	2.92	0.6752	101	5.91	2.3583	186	25.66	12.0850	48	59.00	21.4964	8

Table 12. Overall sherd size means and weighting factors by size class.

Class	Range	$\bar{x}$	Weight
Size 1	0-2 cm	2.3450	.0384
Size 2	2-4 cm	6.0617	.0994
Size 3	4-8 cm	20.7833	.3407
Size 4	>8 cm	61.0075	1.0000

broken into five smaller sherds, increasing the sherd count by 500%; however, the portion of the vessel represented by those five sherds remains unchanged. Consequently, it was more useful to measure sherd assemblages in terms of represented vessel surface area rather than strictly by sherd counts.

Evaluation of Assemblage Homogeneity

Sherd assemblage content was analyzed to assess sources of variability among the samples from each cultural phase and to identify samples that might be severely contaminated. This evaluation was not rigorously analytical; instead, samples were simply manipulated mathematically in order to enhance major sources of assemblage variability and facilitate the detection of unwanted variability within potentially "mixed" assemblages. Criteria used to decide whether or not to exclude a sample from further analysis was based upon expectations derived from Kimball and Baden's (1985) previous quantitative analysis of Woodland and Mississippian sherd assemblages from Tellico Reservoir. Specifically, assemblages whose composition could be best explained by mixture based on Kimball and Baden's observations were subsequently excluded from further analysis.

Each cultural phase was evaluated independently. Assessment of sample variability within each phase was based upon a single-linkage cluster analysis (Johnson 1967; SAS Institute, Inc. 1979) of relative frequencies for primary paste and surface treatment combinations on body sherds with counts weighted by sherd size. Primary combinations were defined as those present in over half of the assemblages representing a specific cultural phase. In short, evaluation of

sample contamination was based solely upon variability in proportions of dominant paste and surface treatment combinations. Shell-tempered and limestone-tempered cordmarked categories, when present in over half of the assemblages, were also combined to form additional summary cordmarked categories (e.g., SH-CMS + SH-CMZ + SH-CM = SH-CM). These criteria of data selection served to screen out possible variability resulting from the presence or absence of rare attribute combinations. The results of the cluster analyses were evaluated using a Scree test (Cattell 1965) to define the number and composition of the derived sample clusters or groups (Figures 11-17). These are discussed below. Summary statistics for the sample groups are provided in Tables 13-19.

Watts Bar Phase. Watts Bar assemblages clustered into two groups, one of which was comprised of a single assemblage from 40MR20. This assemblage contained a relatively small number of sherds (n=68), most of which were from a single crushed quartz-tempered cordmarked vessel. Therefore, this assemblage was excluded from further analysis.

Patrick Phase. Patrick phase assemblages also clustered into two groups. One of these was comprised of two midden assemblages from 40MR44 which appeared to contain a mixture of Watts Bar and Patrick phase sherds. Given the lack of empirical support at present for recognizing an intermediate cultural phase with almost equal occurrence of coarse quartz-tempered and limestone-tempered sherds (however, see McCollough and Faulkner 1973), these two database assemblages were excluded from further analysis.

Icehouse Bottom Phase. Icehouse Bottom phase assemblages

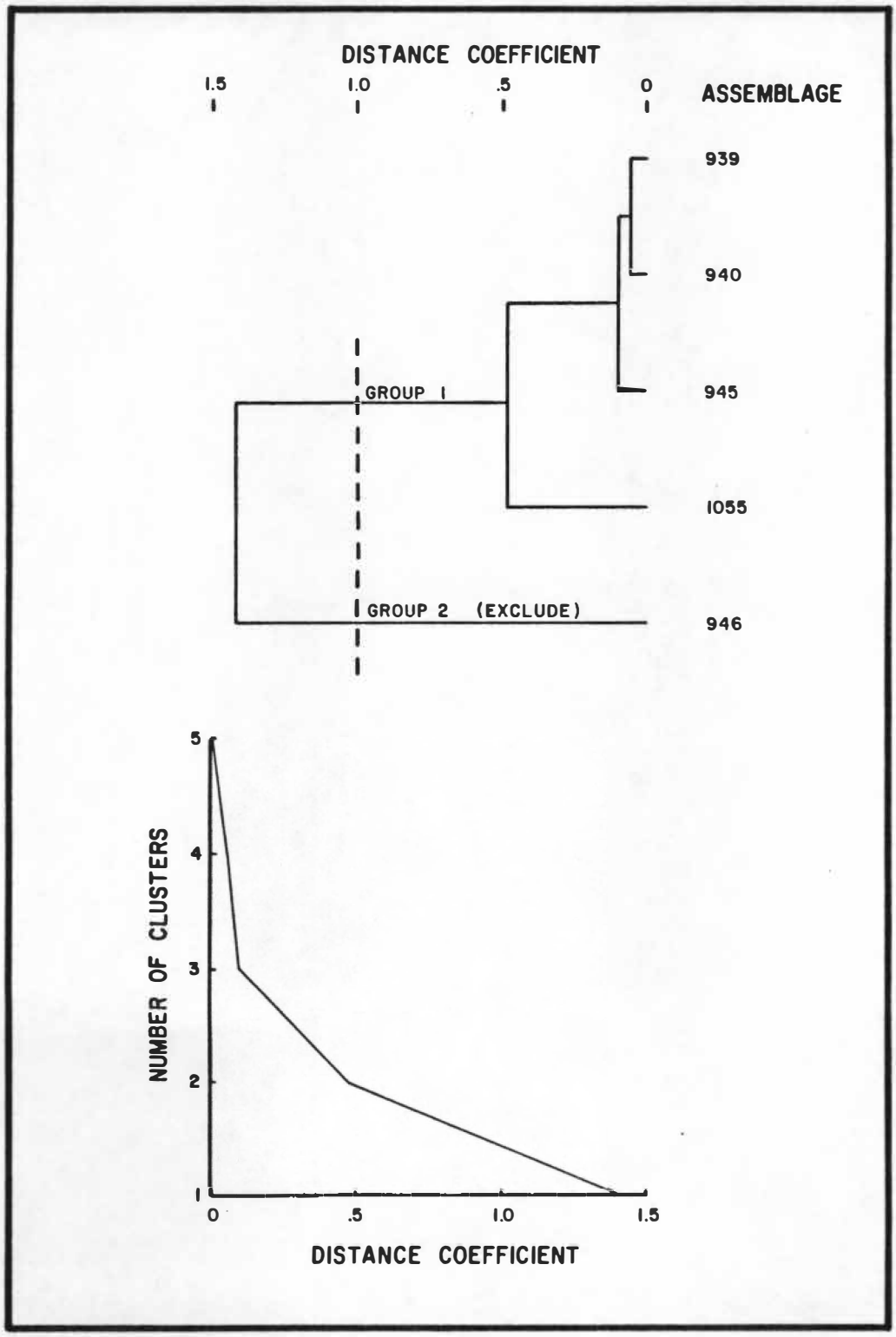


Figure 11. Cluster analysis results for Watts Bar phase ceramic assemblages.

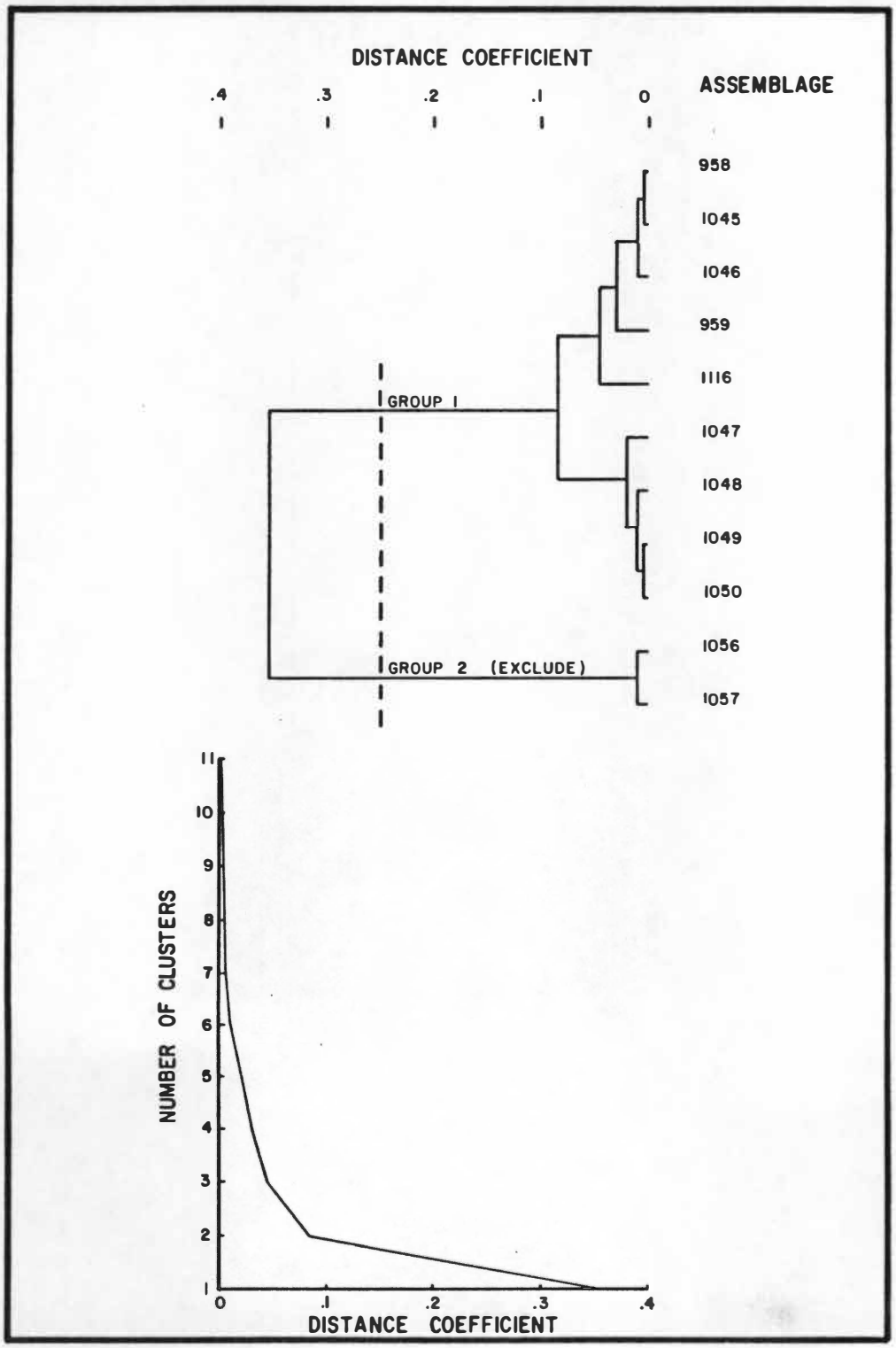


Figure 12. Cluster analysis results for Patrick phase ceramic assemblages.

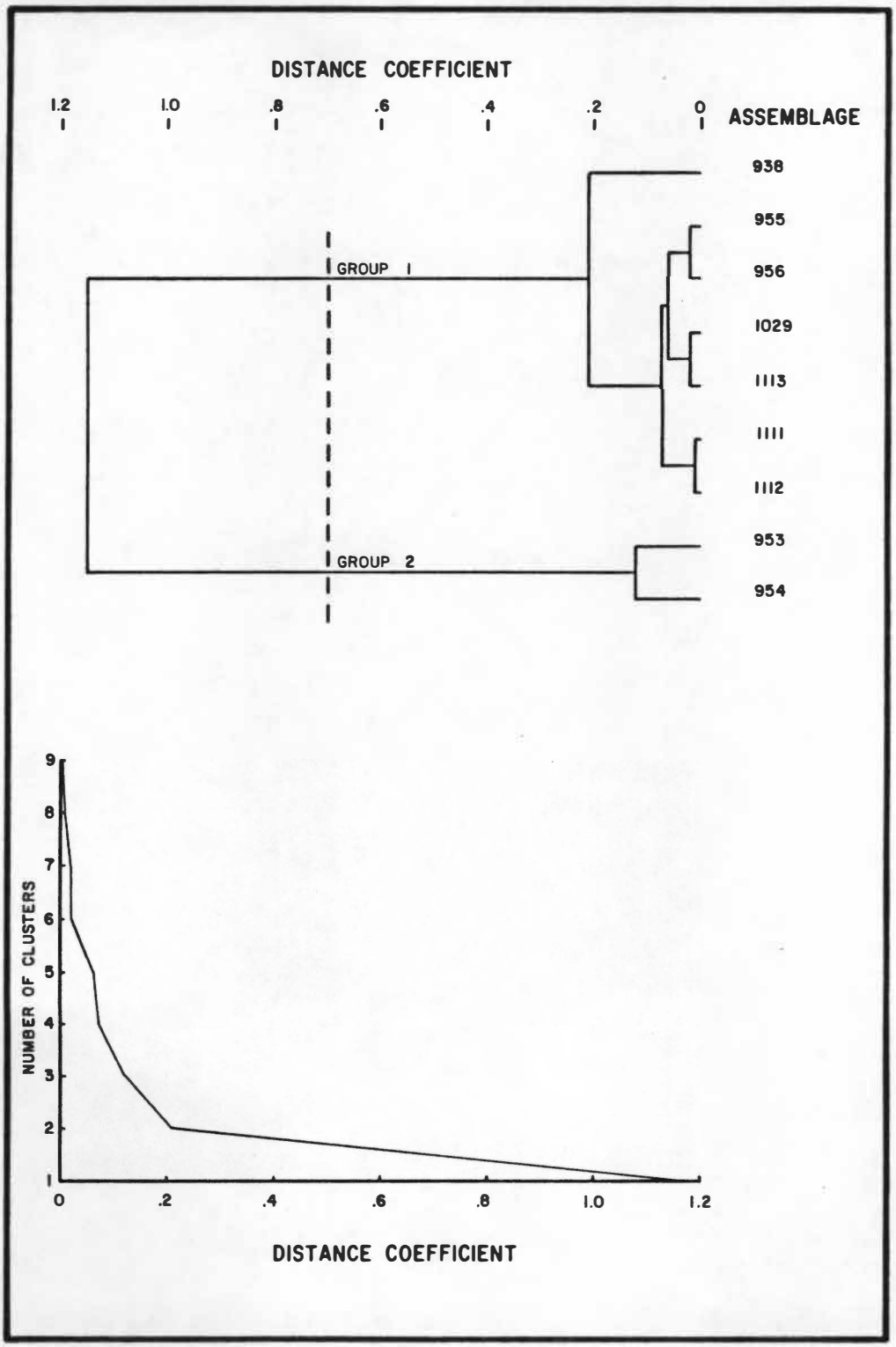


Figure 13. Cluster analysis results for Icehouse Bottom phase ceramic assemblages.

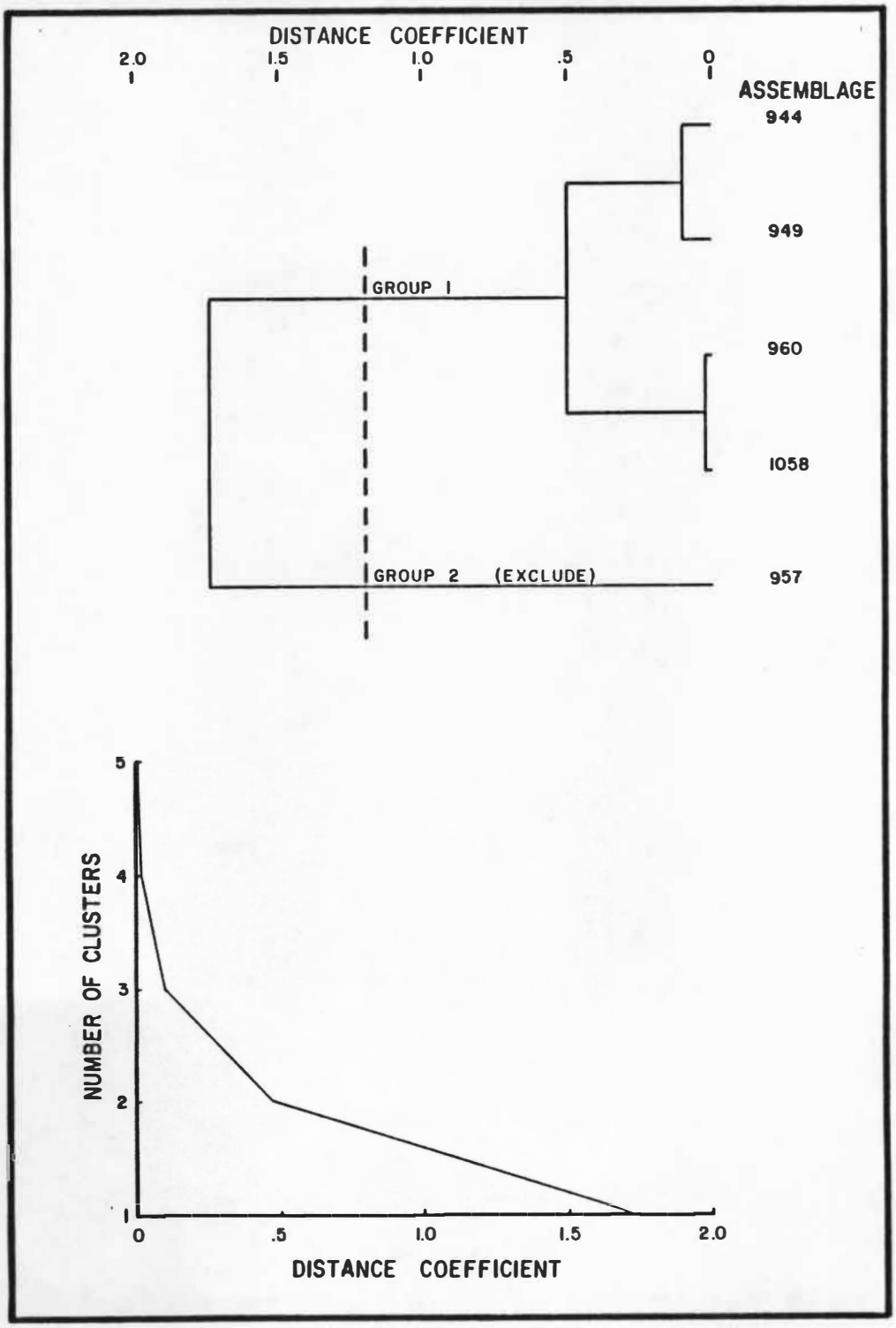


Figure 14. Cluster analysis results for Martin Farm phase ceramic assemblages.

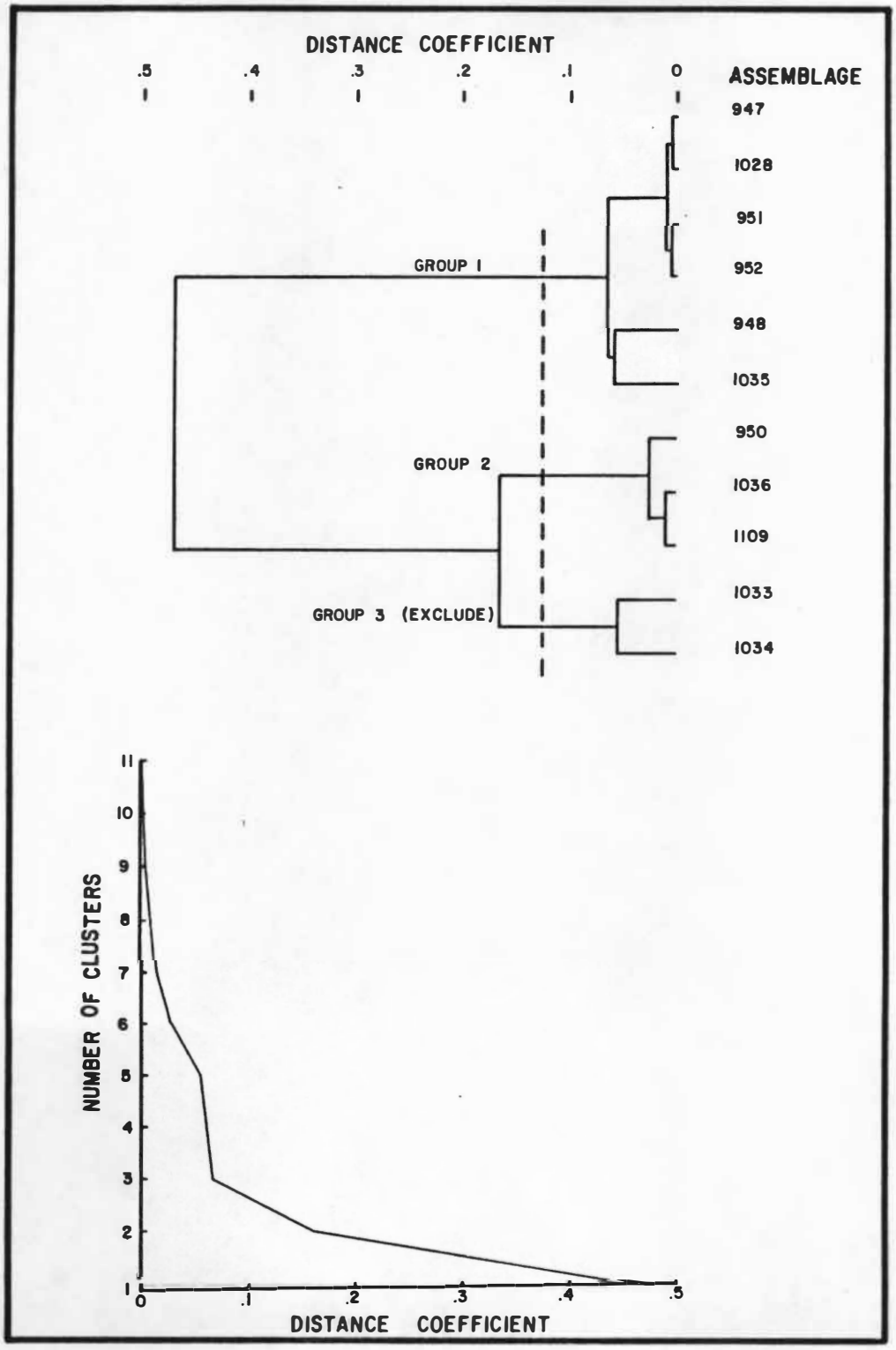


Figure 15. Cluster analysis results for Hiwassee Island phase ceramic assemblages.

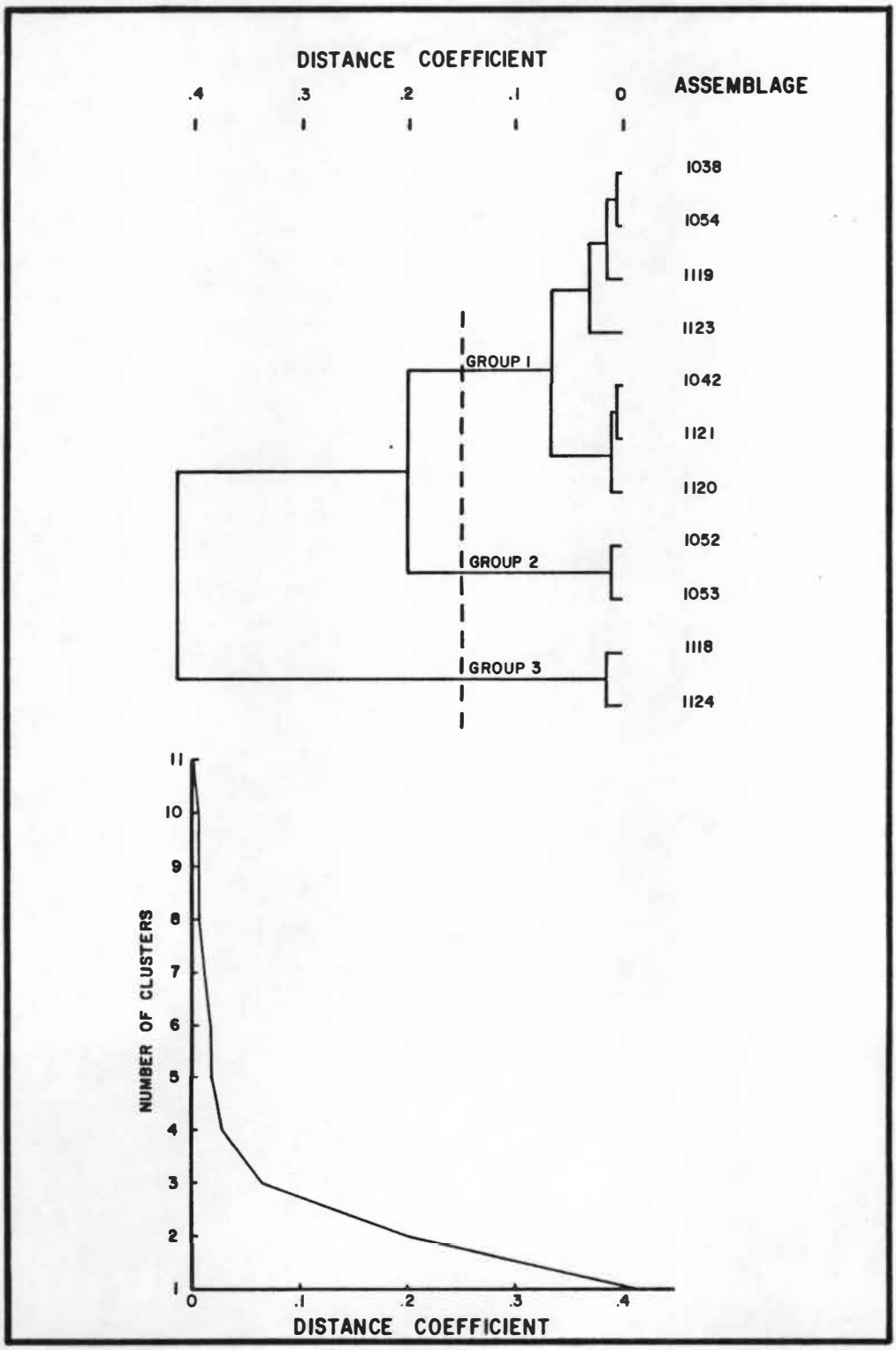


Figure 16. Cluster analysis results for Dallas phase ceramic assemblages.

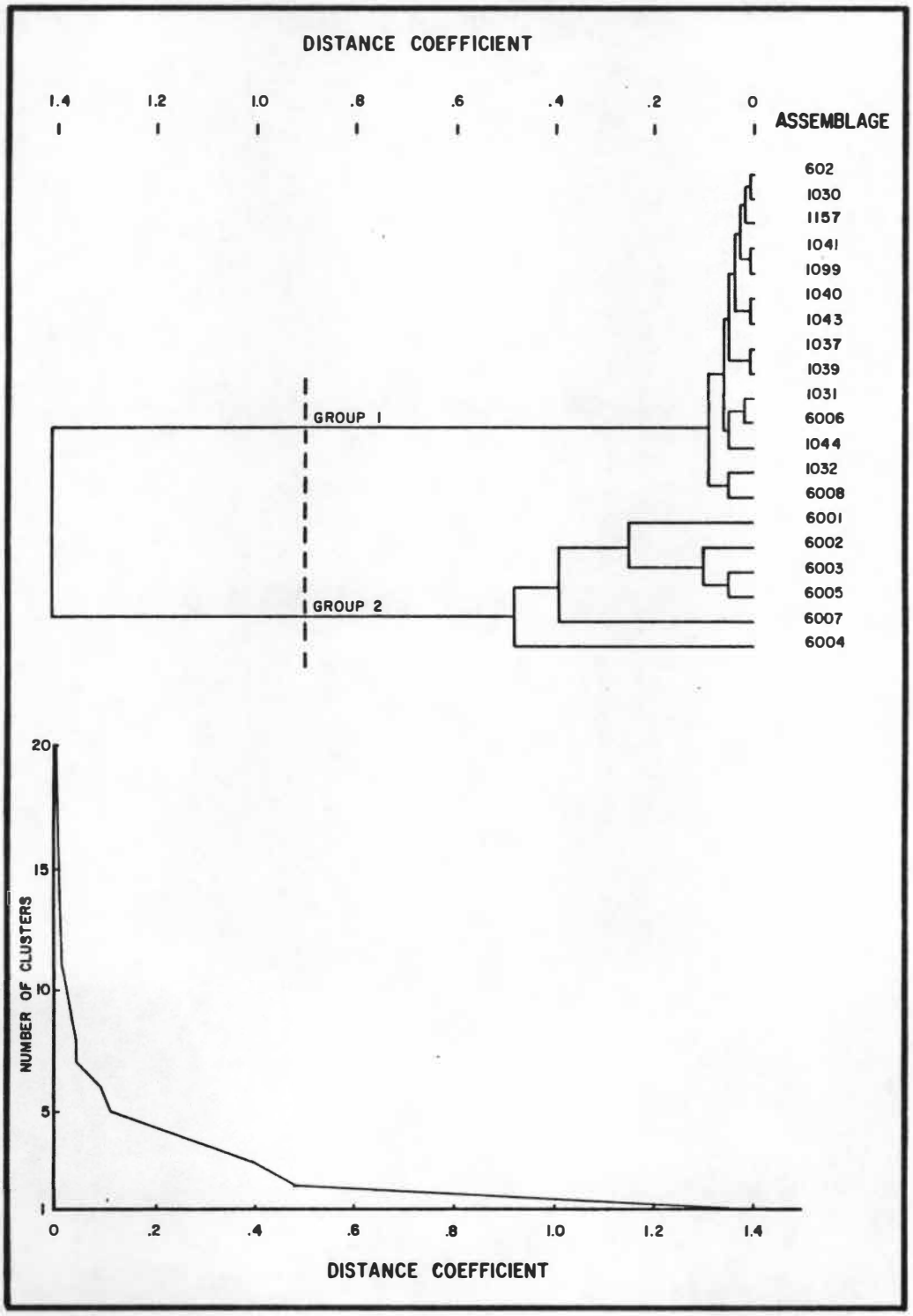


Figure 17. Cluster analysis results for Overhill phase ceramic assemblages.

Table 13. Summary statistics for groups defined by cluster analysis for Watts Bar phase ceramic assemblages.

Paste	Surface	n	$\bar{x}$[1]	s	t[2]
Group 1					
CQ	P	4	.033	.054580	1.21
CQ	CM	4	.236	.210967	2.24
CQ	FM	4	.723	.247702	5.84*
L	FM	4	.008	.009323	1.72
Group 2					
CQ	P	1	.000	-	-
CQ	CM	1	.994	-	-
CQ	FM	1	.006	-	-
L	FM	1	.000	-	-

[1]Mean proportion.

[2]$H_o: \mu = 0$; * indicates rejection of H_o (at $p < .05$).

Table 14. Summary statistics for groups defined by cluster analysis for Patrick phase ceramic assemblages.

Paste	Surface	n	$\bar{x}$[1]	s	t[2]
Group 1					
CQ	P	9	.005	.007855	1.91
CQ	CM	9	.018	.024171	2.23
CQ	FM	9	.029	.046165	1.88
L	P	9	.076	.058871	3.87*
L	CM	9	.872	.079866	32.75*
Group 2					
CQ	P	2	.008	.005657	1.20
CQ	CM	2	.098	.005657	8.52
CQ	FM	2	.330	.045255	10.31
L	P	2	.033	.017678	2.64
L	CM	2	.532	.005657	133.00*

[1]Mean proportion.

[2]$H_o: \mu = 0$; * indicates rejection of H_o (at $p < .05$).

Table 15. Summary statistics for groups defined by cluster analysis for Icehouse Bottom phase ceramic assemblages.

Paste	Surface	n	$\bar{x}$[1]	s	t[2]
Group 1					
MQ	P	7	.005	.005314	2.49*
S	P	7	.075	.042844	4.63*
S	SS	7	.019	.019248	2.61*
S	BR	7	.092	.068713	3.54*
L	P	7	.544	.076796	18.74*
L	CMS	7	.097	.080867	3.17*
L	CMZ	7	.005	.010242	1.29
L	CM	7	.144	.128555	2.96*
L	SS	7	.085	.047458	4.74*
L	CKS	7	.021	.040686	1.37
L	BR	7	.004	.003994	2.18
Group 2					
MQ	P	2	.000	.000000	-
S	P	2	.093	.006364	20.67*
S	SS	2	.036	.005657	9.00
S	BR	2	.698	.192333	5.13
L	P	2	.132	.153442	1.22
L	CMS	2	.000	.000000	-
L	CMZ	2	.000	.000000	-
L	CM	2	.013	.017678	1.04
L	SS	2	.023	.031820	1.02
L	CKS	2	.003	.003536	1.20
L	BR	2	.004	.005657	1.00

[1]Mean proportion.

[2]$H_o: \mu = 0$; * indicates rejection of H_o (at $p < .05$).

Table 16. Summary statistics for groups defined by cluster analysis for Martin Farm phase ceramic assemblages.

Paste	Surface	n	$\bar{x}$[1]	s	t[2]
Group 1					
S	P	4	.011	.011871	1.85
L	P	4	.324	.182564	3.55*
L	CMS	4	.113	.112099	2.02
L	CMZ	4	.268	.078835	6.80*
L	CM	4	.573	.201693	5.68*
L	FM	4	<.001	.000500	1.20
L	SS	4	.011	.015089	1.45
SH	P	4	.079	.103000	1.53
SH	CM	4	.003	.004272	1.40
Group 2					
S	P	1	.000	-	-
L	P	1	.092	-	-
L	CMS	1	.014	-	-
L	CMZ	1	.013	-	-
L	CM	1	.059	-	-
L	FM	1	.004	-	-
L	SS	1	.001	-	-
SH	P	1	.824	-	-
SH	CM	1	.019	-	-

[1]Mean proportion.

[2]$H_o: \mu = 0$; * indicates rejection of H_o (at $p < .05$).

Table 17. Summary statistics for groups defined by cluster analysis for Hiwassee Island phase ceramic assemblages.

Paste	Surface	n	$\bar{x}$[1]	s	t[2]
Group 1					
L	P	6	.030	.024186	3.04*
L	CMS	6	.005	.006154	1.99
L	CMZ	6	.021	.038832	1.32
L	CM	6	.033	.050693	1.59
SH	P	6	.796	.190094	10.26*
SH	CMS	6	.027	.039635	1.67
SH	CMZ	6	.005	.010540	1.16
SH	CM	6	.085	.150252	1.39
SH	FM	6	.027	.034984	1.89
SH	RF	6	.002	.002994	1.64
SH	LOOP	6	.027	.023503	2.81*
Group 2					
L	P	3	.063	.040336	2.71
L	CMS	3	.002	.002082	1.66
L	CMZ	3	.013	.013000	1.73
L	CM	3	.029	.030315	1.66
SH	P	3	.600	.042509	24.45*
SH	CMS	3	.160	.059557	4.65*
SH	CMZ	3	.020	.017010	2.04
SH	CM	3	.244	.028688	14.73*
SH	FM	3	.039	.016166	4.17
SH	RF	3	.018	.016703	1.87
SH	LOOP	3	.007	.010440	1.16
Group 3					
L	P	2	.004	.005657	1.00
L	CMS	2	.002	.002828	1.00
L	CMZ	2	.002	.002121	1.33
L	CM	2	.011	.009192	1.69
SH	P	2	.531	.240416	3.12
SH	CMS	2	.043	.030406	2.00
SH	CMZ	2	.029	.015556	2.64
SH	CM	2	.186	.177484	1.48
SH	FM	2	.224	.094045	3.37
SH	RF	2	.010	.009899	1.43
SH	LOOP	2	.035	.026870	1.84

[1]Mean proportion.

[2]$H_o: \mu=0$; * indicates rejection of H_o (at $p<.05$).

Table 18. Summary statistics for groups defined by cluster analysis for Dallas phase ceramic assemblages.

Paste	Surface	n	$\bar{x}$[1]	s	t[2]
Group 1					
S	P	7	.005	.004461	2.97*
SH	P	7	.791	.083930	24.93*
SH	CMS	7	.119	.067642	4.65*
SH	CMZ	7	.007	.011400	1.62
SH	CM	7	.180	.094335	5.05*
SH	I	7	.024	.023114	2.75*
Group 2					
S	P	2	.004	.005657	1.00
SH	P	2	.820	.070711	16.40*
SH	CMS	2	.114	.086974	1.85
SH	CMZ	2	.000	.000000	-
SH	CM	2	.130	.085560	2.15
SH	I	2	.048	.007778	8.73
Group 3					
S	P	2	.009	.000071	180.00*
SH	P	2	.569	.012021	66.94*
SH	CMS	2	.256	.084853	4.27
SH	CMZ	2	.054	.031113	2.45
SH	CM	2	.420	.007778	76.36*
SH	I	2	.004	.004950	1.14

[1]Mean proportion.

[2]$H_o: \mu = 0$; * indicates rejection of H_o (at $p < .05$).

Table 19. Summary statistics for groups defined by cluster analysis for Overhill phase ceramic assemblages.

Paste	Surface	n	$\bar{x}$[1]	s	t[2]
Group 1					
G	P	14	.006	.014144	1.59
G	CKS	14	.013	.033976	1.43
G	CS	14	.002	.002980	2.51*
SH	P	14	.916	.084948	40.35*
SH	CM	14	.023	.034430	2.49*
SH	SS	14	.005	.009805	1.91
SH	CKS	14	.027	.046782	2.15
SH	CS	14	.009	.023640	1.42
Group 2					
G	P	6	.116	.133454	2.13
G	CKS	6	.048	.027881	4.22*
G	CS	6	.066	.096333	1.68
SH	P	6	.343	.196053	4.28*
SH	CM	6	.002	.004899	0.17
SH	SS	6	.013	.014882	0.36
SH	CKS	6	.306	.195966	3.82*
SH	CS	6	.106	.141896	1.83

[1]Mean proportion.

[2]$H_o: \mu=0$; * indicates rejection of H_o (at $p<.05$).

clustered into two groups, both of which were accepted as representative of this phase. Specifically, the two assemblage groups varied with respect to the relative frequency of sand-tempered brushed and limestone-tempered plain sherds. Both groups were comprised largely of sherds from a single site--40MR23--and crosscut differences in recovery technique which could affect resultant sherd frequencies (see Kimball and Baden [1985] for a discussion of variable screen size effects upon Woodland sherd assemblage composition). Without an acceptable explanation of this variability in terms of recovery bias, it is suggested that these differences probably reflect minor temporal, or possibly functional, variability.

Martin Farm Phase. Mississippian ceramic assemblages tended to yield more complex cluster solutions than Woodland assemblages. Martin Farm phase assemblages clustered into two groups, one of which consisted of a single structure sample from 40MR20. This assemblage, unlike those within the other assemblage group, contained a very high proportion of shell-tempered plain sherds and very few limestone-tempered sherds. This kind of composition is more similar to that displayed by Hiwassee Island phase samples. Given the divergence of this assemblage from the pattern collectively displayed by the other assemblages, it was excluded from further analysis.

Hiwassee Island Phase. Hiwassee Island sherd assemblages clustered into three groups, two of which displayed acceptable variability and consequently were retained. These two groups differed primarily with respect to the relative frequency of shell-tempered cordmarked (S-twisted) sherds. The third assemblage group, being

comprised of two feature samples from 40LD24, was excluded from further analysis because of an abnormally high proportion of shell-tempered fabric-marked sherds. This suggests either depositional or functional bias since such sherds are known to represent a single vessel form (i.e., salt pan).

Dallas Phase. Dallas phase assemblages also clustered into three groups, all of which appeared to represent acceptable ceramic variability. Group differences were due to moderate variability among shell-tempered cordmarked sherds and minor differences in shell-tempered incised frequencies.

Overhill Phase. Finally, Overhill assemblages clustered into two groups. Both groups were retained for further analysis. Assemblages in one group were comprised largely of shell-tempered plain sherds; assemblages in the second group, all of which were from 40MR3, contained moderately high relative frequencies of shell-tempered plain and check-stamped sherds in addition to grit-tempered plain, check-stamped, and complicated-stamped sherds, and shell-tempered complicated-stamped sherds. This proliferation of stamped surfaces has been recognized previously within Overhill Cherokee ceramic assemblages (Baden 1983; Earnest 1971; King 1970).

In summary, evaluation of the database ceramic assemblages resulted in the deletion of six samples. The remaining 66 assemblages constituted the basic data for sherd assemblage modeling and were considered to be generally typical of the cultural phases from which they were selected.

Sherd Assemblage Modeling

Following revision of the ceramic database, assemblages from each cultural phase were combined to form seven major phase assemblages or macro-assemblages. Sherds from each macro-assemblage were subdivided based upon portion of vessel represented. This produced three sherd groups (i.e., Rim, Neck, Body) for each macro-assemblage. Sherds representing two or three portions were counted separately for each portion. Sherd totals were then calculated for each unique paste and surface treatment combination present within each vessel portion group. Following this, all sherd counts were weighted by sherd size and relative frequencies were calculated for each macro-assemblage. These relative frequencies represent estimated probabilities of sherd occurrence. For example, if the relative frequency of shell-tempered plain body sherds within a macro-assemblage is f=.5, then the estimated probability of obtaining a shell-tempered plain body sherd from an assemblage of that cultural phase is p=.5.

The determination of relative sherd frequencies for each phase was followed by a reexamination of the resultant frequencies to detect and eliminate minor sources of sample contamination. Although the procedure discussed above served to rectify major sampling problems resulting from assemblage mixture, it was suspected that minor contamination still remained. This suspicion was based on the fact that all sites from which sherd samples were drawn had experienced multiple occupations during the Woodland and Mississippian periods. Again, observations made by Kimball and Baden (1985) served as a guide for identifying specific instances of contamination. Paste and

surface treatment combinations determined to be not associated with a particular phase were omitted from that macro-assemblage. This process reduced the overall size of each macro-assemblage by about five percent. Most sources of minor sample contamination involved the presence of shell-tempered and grit-tempered sherds in Woodland samples, and the presence of coarse crushed quartz-tempered and limestone-tempered sherds in certain Mississippian samples. Once this final revision of the ceramic database had been accomplished, all relative frequencies were recalculated. These adjusted frequencies are presented in Tables 20-23.

The next step in developing the ceramic temporal model involved combining the seven macro-assemblages and calculating estimated probabilities of paste and surface treatment combinations across (rather than within) cultural phases. One underlying assumption accompanies this step in the analysis which cannot be completely satisfied. In order to accurately estimate the probability that a given sherd is associated with a particular phase, it is necessary to determine the total number, or at least the relative proportion, of sherds generated during each phase. Otherwise, it must be assumed that the amount of sherds produced within each phase is the same. Although this assumption is almost certainly false, the fact that most sherd categories (defined by unique paste and surface treatment combinations) are largely restricted to either a single or a few related cultural phases is reassuring, and suggests that the invalidity of the assumption can be tolerated. Because the ceramic database was not generated by random sampling and the assumption of

Table 20. Relative frequencies of paste and surface treatment combinations on body sherds by cultural phase.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
CQ	P	.0132	.0058	.0011	.0000	.0000	.0000	.0000
CQ	CM	.3169	.0145	.0006	.0000	.0000	.0000	.0000
CQ	FM	.6570	.0317	.0000	.0000	.0000	.0000	.0000
CQ	SS	.0005	.0007	.0004	.0000	.0000	.0000	.0000
CQ	CKS	.0013	.0000	.0000	.0000	.0000	.0000	.0000
CQ	BR	.0000	.0011	.0006	.0000	.0000	.0000	.0000
MQ	P	.0000	.0017	.0043	.0000	.0000	.0008	.0000
MQ	CM	.0005	.0069	.0005	.0000	.0000	.0000	.0000
MQ	FM	.0015	.0058	.0011	.0000	.0000	.0000	.0000
MQ	SS	.0000	.0000	.0010	.0000	.0000	.0024	.0000
MQ	CKS	.0000	.0008	.0000	.0000	.0000	.0000	.0000
MQ	RCSI	.0000	.0000	.0000	.0000	.0000	.0008	.0000
MQ	CCSI	.0000	.0003	.0000	.0000	.0000	.0008	.0000
MQ	BR	.0000	.0000	.0008	.0000	.0000	.0000	.0000
S	P	.0005	.0017	.0630	.0154	.0012	.0043	.0023
S	CM	.0000	.0000	.0061	.0000	.0000	.0000	.0001
S	FM	.0015	.0000	.0015	.0000	.0000	.0000	.0000
S	SS	.0000	.0000	.0124	.0023	.0000	.0000	.0003
S	CKS	.0000	.0033	.0023	.0001	.0006	.0008	.0014
S	RCSI	.0000	.0011	.0000	.0000	.0000	.0016	.0001
S	CCSS	.0000	.0000	.0435	.0001	.0000	.0000	.0000
S	CCSI	.0000	.0000	.0019	.0000	.0000	.0003	.0005
S	BR	.0000	.0056	.1438	.0014	.0000	.0000	.0001
S	ROB	.0000	.0000	.0000	.0000	.0001	.0000	.0000
G	P	.0000	.0000	.0000	.0000	.0000	.0036	.0232
G	SS	.0000	.0000	.0000	.0000	.0000	.0000	.0012
G	CKS	.0000	.0000	.0000	.0000	.0000	.0000	.0229
G	RCSQ	.0000	.0000	.0000	.0000	.0000	.0000	.0137
G	RCSI	.0000	.0000	.0000	.0000	.0000	.0000	.0003
G	CCSQ	.0000	.0000	.0000	.0000	.0000	.0000	.0007
G	CCSI	.0000	.0000	.0000	.0000	.0000	.0000	.0009
G	COB	.0000	.0000	.0000	.0000	.0000	.0000	.0003
G	PUNCT	.0000	.0000	.0000	.0000	.0000	.0000	.0003
L	P	.0043	.0562	.4569	.3996	.0362	.0000	.0000
L	CMS	.0005	.0024	.1019	.0658	.0048	.0000	.0000
L	CMZ	.0000	.0008	.0093	.2171	.0170	.0000	.0000
L	CM	.0005	.0078	.0518	.1902	.0091	.0000	.0000

Table 20 Continued.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
L	FM	.0019	.7346	.0005	.0004	.0000	.0000	.0000
L	SS	.0001	.0091	.0624	.0133	.0000	.0000	.0000
L	CKS	.0000	.0472	.0110	.0030	.0002	.0000	.0000
L	RCSI	.0000	.0000	.0013	.0001	.0001	.0000	.0000
L	CCSP	.0000	.0000	.0142	.0001	.0000	.0000	.0000
L	CCSI	.0000	.0061	.0004	.0000	.0001	.0000	.0000
L	BR	.0000	.0000	.0029	.0018	.0000	.0000	.0000
L	RS	.0000	.0000	.0010	.0000	.0000	.0000	.0000
L	I	.0000	.0000	.0001	.0003	.0000	.0000	.0000
L	PUNCT	.0000	.0000	.0000	.0001	.0000	.0000	.0000
L	MOD	.0000	.0000	.0000	.0003	.0000	.0000	.0000
L	LOOP	.0000	.0000	.0000	.0012	.0000	.0000	.0000
SH	P	.0000	.0000	.0000	.0544	.7684	.6740	.7275
SH	CMS	.0000	.0000	.0000	.0004	.0534	.1800	.0000
SH	CMZ	.0000	.0000	.0000	.0009	.0087	.0129	.0000
SH	CM	.0000	.0000	.0000	.0005	.0305	.0532	.0000
SH	FM	.0000	.0000	.0000	.0001	.0359	.0057	.0000
SH	SS	.0000	.0000	.0000	.0001	.0000	.0008	.0074
SH	CKS	.0000	.0000	.0000	.0000	.0000	.0012	.1019
SH	RCSO	.0000	.0000	.0000	.0000	.0000	.0000	.0196
SH	RCSI	.0000	.0000	.0000	.0000	.0015	.0000	.0005
SH	CCSO	.0000	.0000	.0000	.0000	.0000	.0026	.0321
SH	CCSI	.0000	.0000	.0000	.0000	.0002	.0003	.0003
SH	COB	.0000	.0000	.0000	.0000	.0000	.0000	.0134
SH	RF	.0000	.0000	.0000	.0000	.0071	.0022	.0000
SH	ROB	.0000	.0000	.0000	.0000	.0006	.0000	.0000
SH	I	.0000	.0000	.0000	.0005	.0007	.0216	.0128
SH	PUNCT	.0000	.0000	.0000	.0000	.0000	.0010	.0008
SH	MOD	.0000	.0000	.0000	.0004	.0019	.0099	.0023
SH	FILAP	.0000	.0000	.0000	.0000	.0000	.0099	.0083
SH	LOOP	.0000	.0000	.0000	.0008	.0191	.0002	.0000
SH	STRAP	.0000	.0000	.0000	.0005	.0011	.0021	.0027
SH	LUG	.0000	.0000	.0000	.0000	.0007	.0065	.0003
SL	P	.0000	.0000	.0000	.0073	.0002	.0000	.0000
SL	CM	.0000	.0000	.0000	.0007	.0000	.0000	.0000
MQL	P	.0000	.0014	.0018	.0021	.0000	.0000	.0000
MQL	CM	.0000	.0000	.0000	.0004	.0000	.0000	.0000
MQL	FM	.0000	.0504	.0000	.0000	.0000	.0000	.0000

Table 21. Relative frequencies of paste and surface treatment combinations on neck sherds by cultural phase.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
CQ	P	.1920	.0368	.0073	.0000	.0000	.0000	.0000
CQ	CM	.6177	.0000	.0000	.0000	.0000	.0000	.0000
CQ	FM	.1469	.0000	.0000	.0000	.0000	.0000	.0000
MQ	P	.0000	.0000	.0000	.0004	.0000	.0000	.0000
MQ	SS	.0000	.0000	.0000	.0000	.0000	.0031	.0000
MQ	CCSI	.0000	.0000	.0000	.0000	.0000	.0031	.0000
S	P	.0000	.0368	.4352	.0194	.0000	.0000	.0002
S	CKS	.0000	.0000	.0000	.0000	.0035	.0000	.0000
S	RCSI	.0000	.0000	.0000	.0000	.0000	.0087	.0000
S	CCSS	.0000	.0000	.0052	.0000	.0000	.0000	.0000
S	CCSI	.0000	.0000	.0000	.0000	.0000	.0008	.0000
S	BR	.0000	.0000	.0337	.0010	.0000	.0000	.0000
S	I	.0000	.0000	.0000	.0004	.0000	.0000	.0000
S	PUNCT	.0000	.0000	.0052	.0000	.0000	.0000	.0000
S	FILAP	.0000	.0000	.0000	.0000	.0000	.0000	.0019
G	P	.0000	.0000	.0000	.0000	.0000	.0000	.0225
G	CKS	.0000	.0000	.0000	.0000	.0000	.0000	.0201
G	RCSQ	.0000	.0000	.0000	.0000	.0000	.0000	.0097
G	RCSI	.0000	.0000	.0000	.0000	.0000	.0000	.0017
G	CCSI	.0000	.0000	.0000	.0000	.0000	.0000	.0017
G	FILAP	.0000	.0000	.0000	.0000	.0000	.0000	.0177
G	PUNCT	.0000	.0000	.0000	.0000	.0000	.0098	.0015
L	P	.0434	.1247	.3133	.7719	.0534	.0000	.0000
L	CMS	.0000	.0000	.0464	.0114	.0009	.0000	.0000
L	CMZ	.0000	.0000	.0000	.0166	.0018	.0000	.0000
L	CM	.0000	.0000	.0641	.0293	.0009	.0000	.0000
L	FM	.0000	.4419	.0000	.0021	.0000	.0000	.0000
L	SS	.0000	.0000	.0895	.0021	.0000	.0000	.0000
L	CKS	.0000	.3599	.0000	.0010	.0000	.0000	.0000
L	BR	.0000	.0000	.0000	.0044	.0000	.0000	.0000
L	I	.0000	.0000	.0000	.0191	.0000	.0000	.0000
L	PUNCT	.0000	.0000	.0000	.0633	.0000	.0000	.0000
L	LOOP	.0000	.0000	.0000	.0106	.0000	.0000	.0000
SH	P	.0000	.0000	.0000	.0444	.8992	.6550	.5977
SH	CMS	.0000	.0000	.0000	.0000	.0104	.0863	.0000
SH	CMZ	.0000	.0000	.0000	.0000	.0000	.0122	.0000

Table 21 Continued.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
SH	CM	.0000	.0000	.0000	.0000	.0053	.0501	.0000
SH	FM	.0000	.0000	.0000	.0000	.0009	.0031	.0000
SH	SS	.0000	.0000	.0000	.0000	.0032	.0000	.0004
SH	CKS	.0000	.0000	.0000	.0000	.0000	.0008	.0541
SH	RCSO	.0000	.0000	.0000	.0000	.0000	.0000	.0067
SH	RCSI	.0000	.0000	.0000	.0000	.0009	.0000	.0004
SH	CCSO	.0000	.0000	.0000	.0000	.0000	.0000	.0228
SH	RF	.0000	.0000	.0000	.0000	.0009	.0000	.0000
SH	I	.0000	.0000	.0000	.0000	.0003	.0318	.0299
SH	PUNCT	.0000	.0000	.0000	.0000	.0000	.0008	.0056
SH	FILAP	.0000	.0000	.0000	.0000	.0000	.0449	.2054
SH	LOOP	.0000	.0000	.0000	.0000	.0165	.0061	.0000
SH	STRAP	.0000	.0000	.0000	.0000	.0000	.0834	.0000
SH	LUG	.0000	.0000	.0000	.0000	.0000	.0522	.0000
M	P	.0000	.0000	.0000	.0004	.0000	.0000	.0000
SL	P	.0000	.0000	.0000	.0010	.0009	.0000	.0000
MQL	P	.0000	.0000	.0000	.0010	.0000	.0000	.0000

Table 22. Relative frequencies of paste and surface treatment combinations on rim sherds by cultural phase.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
CQ	P	.1491	.0831	.0028	.0000	.0000	.0000	.0000
CQ	CM	.2888	.0000	.0000	.0000	.0000	.0000	.0000
CQ	FM	.5475	.0000	.0000	.0000	.0000	.0000	.0000
MQ	P	.0000	.0000	.0072	.0004	.0015	.0000	.0000
MQ	PUNCT	.0000	.0000	.0000	.0000	.0000	.0032	.0000
S	P	.0000	.0000	.2899	.0180	.0104	.0032	.0033
S	SS	.0000	.0000	.0000	.0000	.0000	.0000	.0005
S	RCSI	.0000	.0000	.0000	.0000	.0000	.0051	.0000
S	CCSI	.0000	.0000	.0000	.0000	.0000	.0009	.0000
S	I	.0000	.0000	.1359	.0019	.0000	.0000	.0000
S	FILAP	.0000	.0000	.0000	.0000	.0000	.0000	.0053
G	P	.0000	.0000	.0000	.0000	.0000	.0093	.0671
G	I	.0000	.0000	.0000	.0000	.0000	.0000	.0106
G	FILAP	.0000	.0000	.0000	.0000	.0000	.0000	.0059
L	P	.0146	.6599	.3826	.8707	.0475	.0000	.0000
L	CM	.0000	.0000	.0000	.0019	.0000	.0000	.0000
L	FM	.0000	.0526	.0000	.0000	.0000	.0000	.0000
L	I	.0000	.2044	.1746	.0092	.0000	.0000	.0000
L	MOD	.0000	.0000	.0000	.0007	.0000	.0000	.0000
L	LOOP	.0000	.0000	.0000	.0195	.0000	.0000	.0000
SH	P	.0000	.0000	.0000	.0610	.7493	.7809	.7034
SH	CM	.0000	.0000	.0000	.0000	.0015	.0000	.0000
SH	FM	.0000	.0000	.0000	.0000	.0437	.0000	.0019
SH	RCSO	.0000	.0000	.0000	.0000	.0000	.0000	.0019
SH	RF	.0000	.0000	.0000	.0000	.0144	.0032	.0000
SH	I	.0000	.0000	.0000	.0039	.0185	.0310	.0890
SH	PUNCT	.0000	.0000	.0000	.0000	.0000	.0000	.0041
SH	MOD	.0000	.0000	.0000	.0000	.0000	.0105	.0052
SH	FILAP	.0000	.0000	.0000	.0000	.0031	.0517	.1221
SH	LOOP	.0000	.0000	.0000	.0085	.0980	.0003	.0000
SH	STRAP	.0000	.0000	.0000	.0000	.0121	.0074	.0000
SH	LUG	.0000	.0000	.0000	.0000	.0000	.0933	.0000
SL	P	.0000	.0000	.0000	.0026	.0015	.0000	.0000
MQL	P	.0000	.0000	.0072	.0019	.0000	.0000	.0000

Table 23. Relative frequencies for sherd paste by cultural phase.

Portion/ Paste	Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
Body Sherds							
CQ	.9878	.0574	.0035	.0000	.0000	.0000	.0000
MQ	.0026	.0206	.0094	.0031	.0008	.0043	.0042
S	.0017	.0109	.2455	.0081	.0034	.0087	.0049
G	.0000	.0000	.0000	.0000	.0000	.0049	.0739
L	.0079	.8622	.7401	.9142	.0720	.0000	.0000
SH	.0000	.0000	.0000	.0560	.9232	.9815	.9156
M	.0000	.0000	.0000	.0000	.0000	.0007	.0014
SL	.0000	.0000	.0000	.0065	.0004	.0000	.0000
MQL	.0000	.0489	.0016	.0020	.0000	.0000	.0000
Neck Sherds							
CQ	.9658	.0368	.0066	.0000	.0000	.0000	.0000
MQ	.0000	.0000	.0000	.0004	.0000	.0058	.0000
S	.0000	.0368	.4626	.0211	.0034	.0092	.0032
G	.0000	.0000	.0000	.0000	.0000	.0093	.0749
L	.0342	.9264	.5308	.9295	.0567	.0000	.0000
SH	.0000	.0000	.0000	.0465	.9390	.9757	.9219
M	.0000	.0000	.0000	.0004	.0000	.0000	.0000
SL	.0000	.0000	.0000	.0010	.0009	.0000	.0000
MQL	.0000	.0000	.0000	.0010	.0000	.0000	.0000
Rim Sherds							
CQ	.9864	.0833	.0026	.0000	.0000	.0000	.0000
MQ	.0000	.0000	.0067	.0000	.0016	.0031	.0000
S	.0000	.0000	.3998	.0203	.0109	.0089	.0084
G	.0000	.0000	.0000	.0000	.0000	.0099	.0847
L	.0136	.9167	.5747	.9027	.0000	.0000	.0000
SH	.0000	.0000	.0000	.0724	.9860	.9781	.9068
SL	.0000	.0000	.0000	.0026	.0016	.0000	.0000
MQL	.0000	.0000	.0067	.0019	.0000	.0000	.0000

equal sherd density is not met, the derived probability values cannot be shown to represent unbiased estimators.

Calculation of expected probabilities for individual sherd categories within each phase was accomplished by summing the relative frequencies for each category across all seven phases and dividing each relative frequency by that sum, such that:

$$\hat{P}_i = f_i / (\sum f_i),$$

where f_i is the relative frequency of a given sherd category in phase (i).

Estimated probabilities for all sherd categories and sherd pastes on rim, neck, and body sherds are presented in Tables 24-27. These estimates formed the basis for assigning sherds to individual phases. Because it cannot be demonstrated or assumed that sherds occurring together on the surface and in disturbed contexts represent only one moment in time (i.e., a single phase), it was necessary to evaluate these artifacts on a sherd-by-sherd basis. In fact, few sites producing pottery in the Tellico study area were occupied only once during the Woodland and Mississippian periods.

An examination of Tables 24-26 indicated that most sherd categories were largely restricted to a single phase. Therefore, these categories were regarded as temporally diagnostic indicators and were used (when present) as sufficient evidence for identifying a specific occupation. On the other hand, several (n=15) sherd categories were not attributable to a single phase; instead, they occurred in relatively equal frequency among two or three macro-assemblages. In such instances, temporal identification could only be

Table 24. Estimated probabilities for assigning body sherds to cultural phases.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
CQ	P	.6567	.2886	.0547	.0000	.0000	.0000	.0000
CQ	CM	.9450	.0437	.0018	.0000	.0000	.0000	.0000
CQ	FM	.9540	.0460	.0000	.0000	.0000	.0000	.0000
CQ	SS	.3125	.4375	.2500	.0000	.0000	.0000	.0000
CQ	CKS	1.0000	.0000	.0000	.0000	.0000	.0000	.0000
CQ	BR	.0000	.6471	.3529	.0000	.0000	.0000	.0000
MQ	P	.0000	.2500	.6324	.0000	.0000	.0000	.1176
MQ	CM	.0633	.8734	.0633	.0000	.0000	.0000	.0000
MQ	FM	.1786	.6905	.1310	.0000	.0000	.0000	.0000
MQ	SS	.0000	.0000	.2941	.0000	.0000	.0000	.7059
MQ	CKS	.0000	1.0000	.0000	.0000	.0000	.0000	.0000
MQ	RCSI	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
MQ	CCSI	.0000	.2727	.0000	.0000	.0000	.0000	.7273
MQ	BR	.0000	.0000	1.0000	.0000	.0000	.0000	.0000
S	P	.0057	.0192	.7127	.1742	.0136	.0486	.0260
S	CM	.0000	.0000	.9839	.0000	.0000	.0000	.0161
S	FM	.0050	.0000	.0050	.0000	.0000	.0000	.0000
S	SS	.0000	.0000	.8267	.1533	.0000	.0000	.0200
S	CKS	.0000	.3882	.2706	.0118	.0706	.0941	.1647
S	RCSI	.0000	.3929	.0000	.0000	.0000	.5714	.0357
S	CCSS	.0000	.0000	.9977	.0023	.0000	.0000	.0000
S	CCSI	.0000	.0000	.7037	.0000	.0000	.1111	.1852
S	BR	.0000	.0371	.9529	.0093	.0000	.0000	.0007
S	ROB	.0000	.0000	.0000	.0000	1.0000	.0000	.0000
G	P	.0000	.0000	.0000	.0000	.0000	.1343	.8657
G	SS	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	CKS	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	RCSQ	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	RCSI	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	CCSQ	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	CCSI	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	COB	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	PUNCT	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
L	P	.0045	.0596	.4793	.4192	.0380	.0000	.0000
L	CMS	.0029	.0137	.5810	.3751	.0274	.0000	.0000
L	CMZ	.0000	.0033	.0381	.8890	.0696	.0000	.0000
L	CM	.0019	.0301	.1997	.7332	.0351	.0000	.0000

Table 24 Continued.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
L	FM	.0026	.9962	.0007	.0005	.0000	.0000	.0000
L	SS	.0012	.1072	.7350	.1567	.0000	.0000	.0000
L	CKS	.0000	.7687	.1792	.0489	.0033	.0000	.0000
L	RCSI	.0000	.0000	.8667	.0667	.0667	.0000	.0000
L	CCSP	.0000	.0000	.0000	.9930	.0070	.0000	.0000
L	CCSI	.0000	.9242	.0606	.0000	.0152	.0000	.0000
L	BR	.0000	.0000	.7838	.2162	.0000	.0000	.0000
L	RS	.0000	.0000	1.0000	.0000	.0000	.0000	.0000
L	I	.0000	.0000	.2500	.7500	.0000	.0000	.0000
L	PUNCT	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
L	MOD	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
L	LOOP	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
SH	P	.0000	.0000	.0000	.0245	.3455	.3030	.3271
SH	CMS	.0000	.0000	.0000	.0017	.2284	.7699	.0000
SH	CMZ	.0000	.0000	.0000	.0400	.3867	.5733	.0000
SH	CM	.0000	.0000	.0000	.0059	.3622	.6318	.0000
SH	FM	.0000	.0000	.0000	.0024	.8609	.1367	.0000
SH	SS	.0000	.0000	.0000	.0120	.0000	.0964	.8916
SH	CKS	.0000	.0000	.0000	.0000	.0000	.0016	.9884
SH	RCSO	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
SH	RCSI	.0000	.0000	.0000	.0000	.7500	.0000	.2500
SH	CCSO	.0000	.0000	.0000	.0000	.0000	.0749	.9251
SH	CCSI	.0000	.0000	.0000	.0000	.2500	.3750	.3750
SH	COB	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
SH	RF	.0000	.0000	.0000	.0000	.7634	.2366	.0000
SH	ROB	.0000	.0000	.0000	.0000	1.0000	.0000	.0000
SH	I	.0000	.0000	.0000	.0140	.0197	.6067	.3596
SH	PUNCT	.0000	.0000	.0000	.0000	.0000	.5556	.4444
SH	MOD	.0000	.0000	.0000	.0276	.1310	.6828	.1586
SH	FILAP	.0000	.0000	.0000	.0000	.0000	.5440	.4560
SH	LOOP	.0000	.0000	.0000	.0398	.9502	.0100	.0000
SH	STRAP	.0000	.0000	.0000	.1351	.2974	.5675	.0000
SH	LUG	.0000	.0000	.0000	.0000	.0972	.9028	.0000
SL	P	.0000	.0000	.0000	.9733	.0267	.0000	.0000
SL	CM	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
MQL	P	.0000	.2642	.3396	.3962	.0000	.0000	.0000
MQL	CM	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
MQL	FM	.0000	1.0000	.0000	.0000	.0000	.0000	.0000

Table 25. Estimated probabilities for assigning neck sherds to cultural phases.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
CQ	P	.8132	.1559	.0309	.0000	.0000	.0000	.0000
CQ	CM	1.0000	.0000	.0000	.0000	.0000	.0000	.0000
CQ	FM	1.0000	.0000	.0000	.0000	.0000	.0000	.0000
MQ	P	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
MQ	SS	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
MQ	CCSI	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
S	P	.0000	.0749	.8853	.0395	.0000	.0000	.0004
S	CKS	.0000	.0000	.0000	.0000	1.0000	.0000	.0000
S	RCSI	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
S	CCSS	.0000	.0000	1.0000	.0000	.0000	.0000	.0000
S	CCSI	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
S	BR	.0000	.0000	.9712	.0288	.0000	.0000	.0000
S	I	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
S	PUNCT	.0000	.0000	1.0000	.0000	.0000	.0000	.0000
S	FILAP	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	P	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	CKS	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	RCSQ	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	RCSI	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	CCSI	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	FILAP	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	PUNCT	.0000	.0000	.0000	.0000	.0000	.8673	.1327
L	P	.0332	.0954	.2398	.5907	.0409	.0000	.0000
L	CMS	.0000	.0000	.7905	.1942	.0153	.0000	.0000
L	CMZ	.0000	.0000	.0000	.9022	.0978	.0000	.0000
L	CM	.0000	.0000	.6797	.3107	.0095	.0000	.0000
L	FM	.0000	.9953	.0000	.0047	.0000	.0000	.0000
L	SS	.0000	.0000	.9771	.0229	.0000	.0000	.0000
L	CKS	.0000	.9972	.0000	.0028	.0000	.0000	.0000
L	BR	.0000	.0000	.0000	.8302	.1698	.0000	.0000
L	I	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
L	PUNCT	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
L	LOOP	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
SH	P	.0000	.0000	.0000	.0202	.4094	.2982	.2721
SH	CMS	.0000	.0000	.0000	.0000	.1075	.8925	.0000
SH	CMZ	.0000	.0000	.0000	.0000	.0000	1.0000	.0000

Table 25 Continued.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
SH	CM	.0000	.0000	.0000	.0000	.0957	.9043	.0000
SH	FM	.0000	.0000	.0000	.0000	.2250	.7750	.0000
SH	SS	.0000	.0000	.0000	.0000	.8889	.0000	.1111
SH	CKS	.0000	.0000	.0000	.0000	.0000	.0146	.9854
SH	RCSO	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
SH	RCSI	.0000	.0000	.0000	.0000	.6923	.0000	.3077
SH	CCSO	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
SH	RF	.0000	.0000	.0000	.0000	1.0000	.0000	.0000
SH	I	.0000	.0000	.0000	.0000	.0048	.5129	.4823
SH	PUNCT	.0000	.0000	.0000	.0000	.0000	.1250	.8750
SH	FILAP	.0000	.0000	.0000	.0000	.0000	.1794	.8206
SH	LOOP	.0000	.0000	.0000	.0000	.7301	.2699	.0000
SH	STRAP	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
SH	LUG	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
M	P	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
SL	P	.0000	.0000	.0000	.5263	.4737	.0000	.0000
MQL	P	.0000	.0000	.0000	1.0000	.0000	.0000	.0000

Table 26. Estimated probabilities for assigning rim sherds to cultural phases.

Paste/ Surface		Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
CQ	P	.6345	.3536	.0119	.0000	.0000	.0000	.0000
CQ	CM	1.0000	.0000	.0000	.0000	.0000	.0000	.0000
CQ	FM	1.0000	.0000	.0000	.0000	.0000	.0000	.0000
MQ	P	.0000	.0000	.8276	.0000	.1724	.0000	.0000
MQ	PUNCT	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
S	P	.0000	.0000	.8925	.0554	.0320	.0099	.0102
S	SS	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
S	RCSI	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
S	CCSI	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
S	I	.0000	.0000	.9862	.0138	.0000	.0000	.0000
S	FILAP	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	P	.0000	.0000	.0000	.0000	.0000	.1217	.8783
G	I	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
G	FILAP	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
L	P	.0074	.3341	.1937	.4408	.0240	.0000	.0000
L	CM	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
L	FM	.0000	1.0000	.0000	.0000	.0000	.0000	.0000
L	I	.0000	.5265	.4498	.0237	.0000	.0000	.0000
L	MOD	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
L	LOOP	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
SH	P	.0000	.0000	.0000	.0266	.3265	.3403	.3065
SH	CM	.0000	.0000	.0000	.0000	1.0000	.0000	.0000
SH	FM	.0000	.0000	.0000	.0000	.6970	.0000	.3030
SH	RCSO	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
SH	RF	.0000	.0000	.0000	.0000	.8182	.1818	.0000
SH	I	.0000	.0000	.0000	.0274	.1299	.2177	.6250
SH	PUNCT	.0000	.0000	.0000	.0000	.0000	.0000	1.0000
SH	MOD	.0000	.0000	.0000	.0000	.0000	.6688	.3312
SH	FILAP	.0000	.0000	.0000	.0000	.0175	.2923	.6902
SH	LOOP	.0000	.0000	.0000	.0796	.9176	.0028	.0000
SH	STRAP	.0000	.0000	.0000	.0000	.6205	.3795	.0000
SH	LUG	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
SL	P	.0000	.0000	.0000	.6341	.3659	.0000	.0000
MQL	P	.0000	.0000	.7912	.2088	.0000	.0000	.0000

Table 27. Estimated probabilities for assigning sherd pastes to cultural phases.

Portion/ Paste	Watts Bar	Patrick	Icehouse Bottom	Martin Farm	Hiwassee Island	Dallas	Overhill
Body Sherds							
CQ	.9419	.0547	.0034	.0000	.0000	.0000	.0000
MQ	.0578	.4578	.2089	.0689	.0178	.0956	.0933
S	.0060	.0385	.8669	.0286	.0120	.0307	.0173
G	.0000	.0000	.0000	.0000	.0000	.0622	.9378
L	.0030	.3321	.2850	.3521	.0277	.0000	.0000
SH	.0000	.0000	.0000	.0195	.3210	.3412	.3183
M	.0000	.0000	.0000	.0000	.0000	.3333	.6667
SL	.0000	.0000	.0000	.9420	.0580	.0000	.0000
MQL	.0000	.9314	.0305	.0381	.0000	.0000	.0000
Neck Sherds							
CQ	.9570	.0365	.0065	.0000	.0000	.0000	.0000
MQ	.0000	.0000	.0000	.0645	.0000	.9355	.0000
S	.0000	.0686	.8626	.0393	.0063	.0172	.0060
G	.0000	.0000	.0000	.0000	.0000	.1105	.8895
L	.0138	.3739	.2142	.3752	.0229	.0000	.0000
SH	.0000	.0000	.0000	.0161	.3257	.3384	.3198
M	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
SL	.0000	.0000	.0000	.5263	.4737	.0000	.0000
MQL	.0000	.0000	.0000	1.0000	.0000	.0000	.0000
Rim Sherds							
CQ	.9199	.0777	.0024	.0000	.0000	.0000	.0000
MQ	.0000	.0000	.5877	.0000	.1404	.2719	.0000
S	.0000	.0000	.8918	.0453	.0243	.0199	.0187
G	.0000	.0000	.0000	.0000	.0000	.1047	.8953
L	.0056	.3807	.2387	.3749	.0000	.0000	.0000
SH	.0000	.0000	.0000	.0246	.3350	.3323	.3081
SL	.0000	.0000	.0000	.6190	.3810	.0000	.0000
MQL	.0000	.0000	.7791	.2209	.0000	.0000	.0000

made to a range of cultural phases. Phase assignments for individual sherd categories (by vessel portion) are presented in Table 28.

Identification of sherds with residual surfaces, common among surface collections, relied solely upon paste. Although most paste attribute states could also be considered as diagnostic indicators of single phases, the two most common pastes--limestone-tempered and shell-tempered--were not diagnostic at the phase level. Phase assignments based upon paste are presented in Table 29.

Summary

Ceramic artifacts constitute an important source of information within Southeastern archaeology for ascertaining the temporal placement of post-Archaic archaeological manifestations. To maximize the use of such information within the context of the present study, a model of assemblage variability was developed from 66 ceramic artifact samples derived from excavated contexts within Tellico Reservoir, representing Woodland and Mississippian cultural phases. This model was comprised of: 1) expected probabilities for the occurrence of specific sherd categories (i.e., defined by unique combinations of paste, surface treatment, and vessel portion) within each cultural phase; and 2) additional probability estimates for pastes, to be used when surface treatment could not be determined. While such an approach is not without problems, it does allow for objective decisions to be made, based upon an empirically derived model, about the likely temporal placement of sherd samples.

Table 28. Cultural phase assignment for potsherds by paste/surface treatment and vessel portion.

Paste	Surface	Body	Neck	Rim
CQ	P	WB	WB	WB
CQ	CM	WB	WB	WB
CQ	FM	WB	WB	WB
CQ	SS	WB-P-IB	-	-
CQ	CKS	WB	-	-
CQ	BR	WB	-	-
MQ	P	IB	MF*	IB
MQ	CM	P	-	-
MQ	FM	P	-	-
MQ	SS	O	D	-
MQ	CKS	P	-	-
MQ	RCSI	O	-	-
MQ	CCSI	O	D	-
MQ	BR	IB	-	-
MQ	PUNCT	-	-	D
S	P	IB	IB	IB
S	CM	IB	-	-
S	FM	WB-IB	-	-
S	SS	IB	-	O*
S	CKS	P-IB	HI*	-
S	RCSI	D	D	D
S	CCSS	IB	IB	-
S	CCSI	IB	D	D
S	BR	IB	IB	-
S	ROB	HI	-	-
S	I	-	MF	IB
S	PUNCT	-	IB	-
S	FILAP	-	O	O
G	P	O	O	O
G	SS	O	-	-
G	CKS	O	O	-
G	RCSQ	O	O	-
G	RCSI	O	O	-
G	CCSQ	O	-	-
G	CCSI	O	O	-
G	COB	O	-	-
G	I	-	-	O
G	PUNCT	O	D	-
G	FILAP	-	O	O
L	P	IB-MF	MF	P-IB-MF
L	CMS	IB-MF	IB	-
L	CMZ	MF	MF	-
L	CM	MF	IB	MF

Table 28 Continued.

Paste	Surface	Body	Neck	Rim
L	FM	P	P	P
L	SS	IB	IB	-
L	CKS	P	P	-
L	RCSI	IB	-	-
L	CCSP	IB	-	-
L	CCSI	P	-	-
L	BR	IB	MF*	-
L	RS	IB	-	-
L	I	MF	MF	P-IB
L	PUNCT	MF	MF	-
L	MOD	MF	-	MF
L	LOOP	MF	MF	MF
SH	P	HI-D-O	HI-D-O	HI-D-O
SH	CMS	D	D	-
SH	CMZ	HI-D	D	-
SH	CM	HI-D	D	HI
SH	FM	HI	D*	HI
SH	SS	O	HI	-
SH	CKS	O	O	-
SH	RCSO	O	O	O
SH	RCSI	HI	HI	-
SH	CCSO	O	O	-
SH	CCSI	HI-D-O	-	-
SH	COB	O	-	-
SH	RF	HI	HI	HI
SH	ROB	HI	-	-
SH	I	D	D-O	O
SH	PUNCT	D-O	O	O
SH	MOD	D	-	D
SH	FILAP	D-O	O	O
SH	LOOP	HI	HI	-
SH	STRAP	D	D	-
SH	LUG	D	D	-
M	P	-	MF	-
SL	P	MF	MI-HI	MI-HI
SL	CM	MF	-	-
MQL	P	P-IB-MF	MF	IB
MQL	CM	MF	-	-
MQL	FM	P	-	-

* Assignment should be accepted with caution.

Cultural phase codes are as follows: WB-Watts Bar; P-Patrick; IB-Icehouse Bottom; MF-Martin Farm; HI-Hiwassee Island; D-Dallas; O-Overhill.

Table 29. Cultural phase assignments for paste types on potsherds (by vessel portion).

Paste	Body	Neck	Rim
CQ	WB	WB	WB
MQ	P-IB	D*	IB
S	IB	IB	IB
G	O	O	O
L	P-IB-MF	P-IB-MF	P-IB-MF
SH	HI-D--O	HI-D-O	HI-D-O
M	O	MF	-
SL	MF	MF-HI	MF
MQL	P	MF*	IB

* Assignment should be assepted with caution.

Cultural phase codes are as follows: WB-Watts Bar; P-Patrick; IB-Icehouse Bottom; MF-Martin Farm; HI-Hiwassee Island; D-Dallas; O-Overhill.

CONSIDERATION OF BURIED ARCHAEOLOGICAL COMPONENTS

Introduction

The presence of deeply buried archaeological deposits along the first terrace (T-1) of the lower Little Tennessee River was first recognized by Chapman (1975) at the Rose Island site (40MR44). Early Archaic Upper Kirk, St. Albans, and LeCroy strata were documented at this site at 4.6-7.8 ft below the present land surface. Subsequent investigations to identify and sample buried sites elsewhere in the valley resulted in the discovery of over 70 such sites containing at least 260 buried strata which ranged in age from Early Archaic to Early Woodland (Chapman 1977, 1978, 1980, 1981). Unfortunately, almost 80% of these strata could not be assigned to a cultural phase because of an absence of diagnostic artifacts.

While some of these strata were as deep as 14.0 ft, most were less that 10 ft deep. Since a majority of deep test trenches (using a backhoe) were only excavated to a depth of approximately 14 ft, it cannot be stated with certainty that earlier culture-bearing strata were absent at greater depth. However, the presence of substantially earlier archaeological deposits is considered unlikely. An investigation of the geomorphic history of the lower Little Tennessee River valley by Delcourt (1980), focusing on alluvial terrace development, suggested that the T-1 terrace prior to the eighth millenium B.C. may have been too unstable for prolonged habitation. This was corroborated by radiocarbon assays of deeply buried (ca. 20-25 ft below surface) organic material from Bussell Island (12,910±390 B.C. and 8,810±280 B.C.), Bacon Farm (8,760±210 B.C. and

9,070±210 B.C.), and Icehouse Bottom (7,430±215 B.C.). These data indicate extremely rapid alluviation immediately prior to ca. 7,200 B.C. (Foley and Chapman 1977; Chapman 1985a).

Buried site investigations within Tellico Reservoir, particularly the buried site reconnaissance conducted during 1976-1977 (Chapman 1978), provided extensive if not systematic survey coverage for the first terrace of the Little Tennessee River between Bussell Island (RM 0) and Citico Creek RM 31), and sporadic coverage of the Tellico River first terrace between its confluence with the Little Tennessee River and the mouth of Notchy Creek. The methodology employed by Chapman (1978) during his buried site reconnaissance was as follows. Backhoe trenches measuring approximately 3 ft wide by 12 ft long (at top) by 10-14 ft deep, and positioned perpendicular to the river, were excavated at most known surface sites and at locations considered geomorphically conducive to rapid and continuous alluviation (i.e., point bars and eddy areas below natural valley constrictions). Most of these trenches were placed near the front edge of the first terrace. Trench walls were trowelled and inspected to identify buried archaeological deposits. Archaeological deposits were recognized primarily by ceramic artifacts, lithic artifacts or fire-cracked rock, or by the observation of an organically enriched soil horizon containing artifacts, features, fired areas, rock concentrations, or charcoal. Once such deposits were identified within a trench, additional trenches were excavated at close, regular intervals along the first terrace to define site limits. Additional trenches were usually excavated beyond these limits (though at greater and more

sporadic intervals) to identify other buried sites or confirm their absence.

Artifacts generated by Chapman's reconnaissance consisted mostly of items pulled from the trench walls; however, limited test excavations (ca. 5x5-ft) were also conducted at selected strata adjacent to some trenches to retrieve artifact samples. In addition to this reconnaissance, more extensive investigations with systematic mapping, feature excavation, and artifact recovery were conducted at a few buried sites, including Iddins (40LD38), Bacon Farm (40LD35), Rose Island (40MR44), Patrick (40MR40), Icehouse Bottom (40MR23), Harrison Branch (40MR21), Calloway Island (40MR41), Howard (40MR66), Bacon Bend (40MR25), and Citico (40MR7). These excavations provide the best record of Archaic period settlement within the Tellico study area.

Regression Analysis of Temporal Contexts

The most severe problem with the data generated by the buried site reconnaissance was that a majority of identified strata could not be associated with any cultural phase. To help rectify this problem, an analysis of all buried components containing culturally diagnostic artifacts or radiocarbon-dated deposits was undertaken to develop a predictive model for estimating the temporal affinity of buried strata (see Table 30). This analysis was based upon the premise that the rate of first terrace aggradation should be generally similar within geomorphically similar segments of the lower Little Tennessee River valley.

Fifty-eight buried components from 27 sites were examined. All of these components were temporally identified (to phase) and

Table 30. Summary of Tellico radiocarbon dates for Early Archaic, Middle Archaic, Late Archaic, and Early Woodland cultural phases.

Period	Cultural Phase	Site	Provenience	Date[1] (BC)	Lab No.	Reference	Average Date[2] (BC)
Early Archaic (EA)	Lower Kirk (LK)	40MR23	Stratum Q	7485±270	GX-4126	Chapman 1977	7341±179 (LK)
	Lower Kirk	40MR23	Stratum Q	7225±240	GX-4127	Chapman 1977	
	Upper Kirk (UK)	40LD35	Stratum 9	7155±190	GX-4707	Chapman 1978	7253±91 (UK)
	Upper Kirk	40MR23	Stratum L	7400±240	GX-4125	Chapman 1977	
	Upper Kirk	40MR40	Stratum 16	7460±290	GX-4122	Chapman 1977	
	Upper Kirk	40MR44	Stratum 8	7380±250	GX-3564	Chapman 1975	
	Upper Kirk	40MR44	Stratum 11	7160±145	GX-3565	Chapman 1975	
	St. Albans (SA)	40MR44	Stratum 7	6850±270	GX-3167	Chapman 1975	6751±134 (SA)
	St. Albans	40MR44	Stratum 7	6750±300	GX-3168	Chapman 1975	
	St. Albans	40MR44	Stratum 7-C	6710±180	GX-3598	Chapman 1975	
	LeCroy (L)	40MR23	Stratum G	5775±185	GX-7726	Unpublished	6106±124 (L)
	LeCroy	40MR41	Stratum 7	6170±195	GX-7727	Unpublished	
	LeCroy	40MR44	Stratum 7-A	6970±325	GX-3597	Chapman 1975	
	Undesignated EA	40MR21	Stratum 29	6595±245	GX-4119	Chapman 1977	6393±91 (SA/L)
Middle Archaic (MA)	Kirk Stemmed (KS)	40MR44	Stratum 4	6070±190	GX-3563	Chapman 1975	6070±190 (KS)
	Stanly (S)	40MR40	Stratum 6	5860±175	GX-4121	Chapman 1977	5852±136 (S)
	Stanly	40MR23	Stratum D	5840±215	GX-4123	Chapman 1977	
	Morrow Mtn. (MM)	40MR66	Stratum 7	5305±165	GX-4704	Chapman 1979	5198±137 (MM)
	Morrow Mtn.	40MR23	Stratum B	5045±245	GX-4124	Chapman 1977	
	Undesignated MA	40MR21	Stratum 21	5500±250	GX-4120	Chapman 1977	5627±81 (All MA)
Late Archaic (LA)	Savannah River (SR)	40MR25	Stratum 7	3092±194	GX-5043	Chapman 1981	2712±97 (SR)
	Savannah River	40MR25	Stratum 7	2687±124	UGA-1879	Chapman 1981	
	Savannah River	40MR25	Stratum 7	2050±260	GX-5044	Chapman 1981	
	Iddins (I)	40DL38	Stratum 3	2149±187	GX-4705	Chapman 1981	1871±70 (I)
	Iddins	40LD38	Stratum 3	1906±155	UGA-1883	Chapman 1981	
	Iddins	40LD38	Stratum 3	1559±155	GX-4706	Chapman 1981	
	Undesignated LA	40MR40	Feature 98	2867±190	GX-5244	Schroedl 1978b	2140±50 (All LA)
	Undesignated LA	40MR21	Stratum 5	2823±252	GX-2607	Schroedl 1975	
	Undesignated LA	40MR23	Feature 78	1448±150	GX-2155	Gleeson 1970	
Early Woodland (EW)	Watts Bar (WB)	40MR25	Stratum 5	557±208	GX-1570	Salo 1969	577±208 (EW)

[1] All Late Archaic and Early Woodland dates are corrected following Damon et al. (1974).

[2] Dates are averaged following Long and Rippeteau (1974).

spatially located with respect to position along the Little Tennessee River. Most were situated along the front edge of the first terrace. All depth measurements were taken for strata lying horizontal to the surface. Components represented only by dipping strata were excluded from consideration since such strata could not be characterized by a single depth measurement. The sample was then stratified into four river segments based upon geomorphic variability and inferred differences in depositional history (Paul Delcourt, personal communication 1982). River segments were defined as follows: Segment 1 - from the mouth of the Little Tennessee River at Bussell Island to the valley constriction at Bat Creek Knobs (RM 12.5); Segment 2 - from Bat Creek Knobs to the valley constriction just above the mouth of Tellico River near Fort Loudoun (RM 19.5); Segment 3 - from Fort Loudoun to the valley constriction at the edge of the Dissected Knobs above the Howard site (40MR66) (RM 24.5); and Segment 4 - from the Howard site to the upper end of Tellico Reservoir above the mouth of Citico Creek (RM 31.5). Data used in this analysis are presented in Table 31.

These data were analyzed using least-squares regression to model the relationship of radiocarbon time (dependent variable) to depth below surface (independent variable). Regression analysis was considered appropriate since a linear relationship was expected to exist between the dependent and independent variables. The analysis employed SAS's GLM procedure (SAS Institute, Inc. 1979). Data were grouped and analyzed separately by river segment. Subsequently, all of the data were combined and treated as a single sample. Initial

Table 31. Buried site data used in regression analysis.

Site	River Mile	River Segment	Depth (ft B.S.)	Median Depth (ft B.S.)	Date (B.C.)	Cultural[1] Phase	Reference
40LD17	0	1	1.0-1.8	1.4	577	EW (WB)	Chapman 1978
40LD17	0	1	8.2-12.4	10.3	7253	EA (UK)	Chapman 1978
40LD38	3.8	1	3.8-5.2	4.5	1871	LA (I)	Chapman 1978
40LD79	4.6	1	3.8-4.3	4.1	5852	MA (S)	Chapman 1978
40LD78	4.7	1	2.1-3.5	2.8	577	EW (WB)	Chapman 1978
40LD39	4.9	1	0.8-3.5	2.2	577	EW (WB)	Chapman 1978
40LD40	8.2	1	1.7-2.8	2.3	577	EW (WB)	Chapman 1978
40LD73	9.3	1	6.0-6.8	6.4	7253	EA (UK)	Chapman 1978
40LD72	9.6	1	11.0-12.8	11.9	7253	EA (UK)	Chapman 1978
40LD71	9.7	1	1.0-2.5	1.8	577	EW (WB)	Chapman 1978
40LD71	9.7	1	5.0-5.6	5.3	6070	MA (KS)	Chapman 1978
40LD75	9.8	1	0.8-1.9	1.3	577	EW (WB)	Chapman 1978
40LD77	10.1	1	7.6-8.6	8.1	7253	EA (UK)	Chapman 1978
40LD68	11.5	1	7.5-8.6	8.1	7253	EA (UK)	Chapman 1978
40LD35	11.7	1	3.8-5.4	4.6	6070	MA (KS)	Chapman 1978
40LD35	11.7	1	4.8-7.0	5.9	6393	EA (SA/L)	Chapman 1978
40LD35	11.7	1	7.3-8.7	8.0	6393	EA (SA/L)	Chapman 1978
40LD35	11.7	1	8.7-11.6	10.1	7253	EA (UK)	Chapman 1978
40MR44	16.9	2	1.1-2.1	1.6	577	EW (WB)	Chapman 1975
40MR44	16.9	2	4.6-4.8	4.7	6106	EA (L)	Chapman 1975
40MR44	16.9	2	5.4-6.8	6.1	6751	EA (SA)	Chapman 1975
40MR44	16.9	2	7.8-8.1	8.0	7253	EA (UK)	Chapman 1975
40MR44	16.9	2	8.6-9.0	8.8	7253	EA (UK)	Chapman 1975
40MR44	16.9	2	1.2-2.2	1.7	2140	LA	Chapman 1975
40MR44	16.9	2	2.9-3.6	3.3	6070	MA (KS)	Chapman 1975
40MR44	16.9	2	4.4-5.3	4.9	6070	MA (KS)	Chapman 1975
40MR87	18.5	2	1.5-2.3	1.9	577	EW (WB)	Chapman 1978
40MR183	20.0	3	0.7-1.4	1.1	577	EW (WB)	Chapman 1978
40MR183	20.0	3	1.4-2.3	1.9	2140	LA	Chapman 1978
40MR40	20.3	3	0.7-1.7	1.2	577	EW (WB)	Chapman 1977
40MR40	20.3	3	1.7-2.5	2.1	2867	LA (SR?)	Chapman 1977
40MR40	20.3	3	5.6-7.2	6.4	5860	MA (S)	Chapman 1977
40MR40	20.3	3	7.2-7.7	7.5	6070	MA (KS)	Chapman 1977
40MR40	20.3	3	7.7-9.8	8.8	6106	EA (LK)	Chapman 1977
40MR40	20.3	3	9.8-11.5	10.7	6751	EA (SA)	Chapman 1977
40MR40	20.3	3	11.5-12.5	12.0	7460	EA (UK)	Chapman 1977
40MR23	20.9	3	0.9-2.3	1.6	5045	MA (MM)	Chapman 1977
40MR23	20.9	3	2.3-3.2	2.7	5840	MA (S)	Chapman 1977
40MR23	20.9	3	4.5-5.0	4.8	5775	EA (L)	Chapman 1977
40MR23	20.9	3	5.5-6.1	5.8	6751	EA (SA)	Chapman 1977
40MR23	20.9	3	6.1-7.2	6.7	7253	EA (UK)	Chapman 1977
40MR23	20.9	3	8.2-10.2	9.2	7341	EA (LK)	Chapman 1977
40MR85	20.9	3	1.0-2.3	1.7	577	EW (WB)	Chapman 1978
40MR21	21.3	3	2.7-3.2	3.0	2823	LA	Chapman 1977
40MR21	21.3	3	4.7-5.0	4.9	5852	MA (S)	Chapman 1977
40MR21	21.3	3	8.3-9.1	8.7	6595	EA (SA)	Chapman 1977
40MR86	21.8	3	1.4-2.2	1.8	577	EW (WB)	Chapman 1978
40MR86	21.8	3	2.2-3.5	2.9	2140	LA	Chapman 1978
40MR41	23.3	3	4.2-4.8	4.5	5627	MA	Chapman 1979
40MR41	23.3	3	5.1-5.7	5.4	6106	EA (L)	Chapman 1979
40MR162	23.6	3	0.8-1.8	1.3	577	EW (WB)	Chapman 1978
40MR66	23.9	3	4.0-4.7	4.3	5198	MA (MM)	Chapman 1979
40MR66	23.9	3	5.7-7.4	6.6	5852	MA (S)	Chapman 1979
40MR66	23.9	3	7.3-7.9	7.6	6070	MA (KS)	Chapman 1979
40MR25	26.4	4	3.0-3.5	3.2	2712	LA (SR)	Chapman 1981
40MR35	29.8	4	2.2-2.9	2.6	577	EW (WB)	Chapman 1978
40MR7	30.9	4	3.2	3.2	2140	LA	Chapman 1978
40MR7	30.9	4	3.0-3.5	3.3	6070	MA (KS)	Chapman 1978

[1]See Table 30 for key to cultural phase codes.

analysis indicated a curvilinear relationship between the dependent and independent variables. As a consequence, the four river segment samples and the total sample were reanalyzed to measure their fit to a second-order polynomial equation incorporating the square of the independent variable within the model (i.e., $Y = a + b_1X + b_2X^2$).

All but Segment 4 produced statistically significant regression lines with relatively good fit, as measured by R^2 (see Tables 32-36). Segment 4 produced non-significant results, supporting Chapman's (1978:143) earlier observation that "in this section of the river, the river gradient was too steep and the valley too narrow to permit the early and continued build up of first terrace alluvial sediments." Given these results, it was concluded that buried component depth at Segment 4 sites is not a reliable predictor of component age. Comparison of the regression models for the remaining three river segment samples with the model derived from the total sample suggested that the individual segment models possessed greater predictive power. Specifically, the degree of fit improved considerably when the river valley was segmented.

Examination of the actual regression lines for Segments 1-3 suggest the following geomorphic relationships (Figure 18). First, Segments 1 and 2 produced almost identical curves which suggest that their rates of alluviation were similar. Segment 1 deposits were more deeply buried (ca. 0.4-1.75 ft deeper) than Segment 2 deposits of the same age, suggesting that Early Woodland sites are probably more apt to be buried (and therefore not detectable at the surface) within the lower valley below Bat Creek Knobs than within the upper valley. This

Table 32. Results of regression analysis to model the relationship between C-14 time and depth below surface for River Segment 1 (RM 0-12.5).

ANOVA TABLE				MODEL				
Source	df	Sum of Squares	Mean Square	Parameter	Estimate	Standard Error of Estimate	F	p
Regression	2	138482151.12	69241075.56	Intercept	-2990.7646	939.4717	-	-
Error	15	20063295.38	1337553.03	Depth	2184.1697	361.2918	36.55	<.0001
Total	17	158545446.50	-	Depth*Depth	-113.3923	28.6549	15.66	.0013

F=51.77 p<.0001 R^2=.8735

Table 33. Results of regression analysis to model the relationship between C-14 time and depth below surface for River Segment 2 (RM 12.5-19.5).

ANOVA TABLE				MODEL				
Source	df	Sum of Squares	Mean Square	Parameter	Estimate	Standard Error of Estimate	F	p
Regression	2	57870800.31	28935400.16	Intercept	-3185.5465	1309.0544	-	-
Error	6	5626467.24	937744.54	Depth	2990.7125	627.8126	22.69	<.0031
Total	8	63497267.55	-	Depth*Depth	-209.0408	61.5035	11.55	.0145

F=30.86 p<.0007 R^2=.9114

Table 34. Results of regression analysis to model the relationship between C-14 time and depth below surface for River Segment 3 (RM 19.5-24.5).

ANOVA TABLE				MODEL				
Source	df	Sum of Squares	Mean Square	Parameter	Estimate	Standard Error of Estimate	F	p
Regression	2	120162173.07	60081086.54	Intercept	-578.0273	702.7039	-	-
Error	24	33096882.93	1379036.79	Depth	1661.8774	287.5649	33.40	<.0001
Total	26	153259056.00	-	Depth*Depth	-89.7000	24.0659	13.89	.0011

F=43.57 p<.0001 R^2=.7840

Table 35. Results of regression analysis to model the relationship between C-14 time and depth below surface for River Segment 4 (RM 24.5-31.5).

ANOVA TABLE				MODEL				
Source	df	Sum of Squares	Mean Square	Parameter	Estimate	Standard Error of Estimate	F	p
Regression	2	15892030.75	7946015.38	Intercept	389052.2857	63930.6716	-	-
Error	1	163592.00	163592.00	Depth	-273315.9524	44195.1735	38.25	.1021*
Total	3	16055622.75	-	Depth*Depth	47654.7619	7552.1272	39.82	.1001*

F=48.57 p=.1009* R^2=.9898

* Not significant at p=.05.

Table 36. Results of regression analysis to model the relationship between C-14 time and depth below surface for the entire lower Little Tennessee River valley.

ANOVA TABLE				MODEL				
Source	df	Sum of Squares	Mean Square	Parameter	Estimate	Standard Error of Estimate	F	p
Regression	2	316548715.80	158274357.90	Intercept	-1609.6358	550.9175	-	-
Error	55	86255356.20	1568279.20	Depth	1933.4116	223.6368	74.74	<.0001
Total	57	402804072.00	-	Depth*Depth	-104.3363	18.5503	31.63	<.0001

F=100.92 p<.0001 R^2=.7859

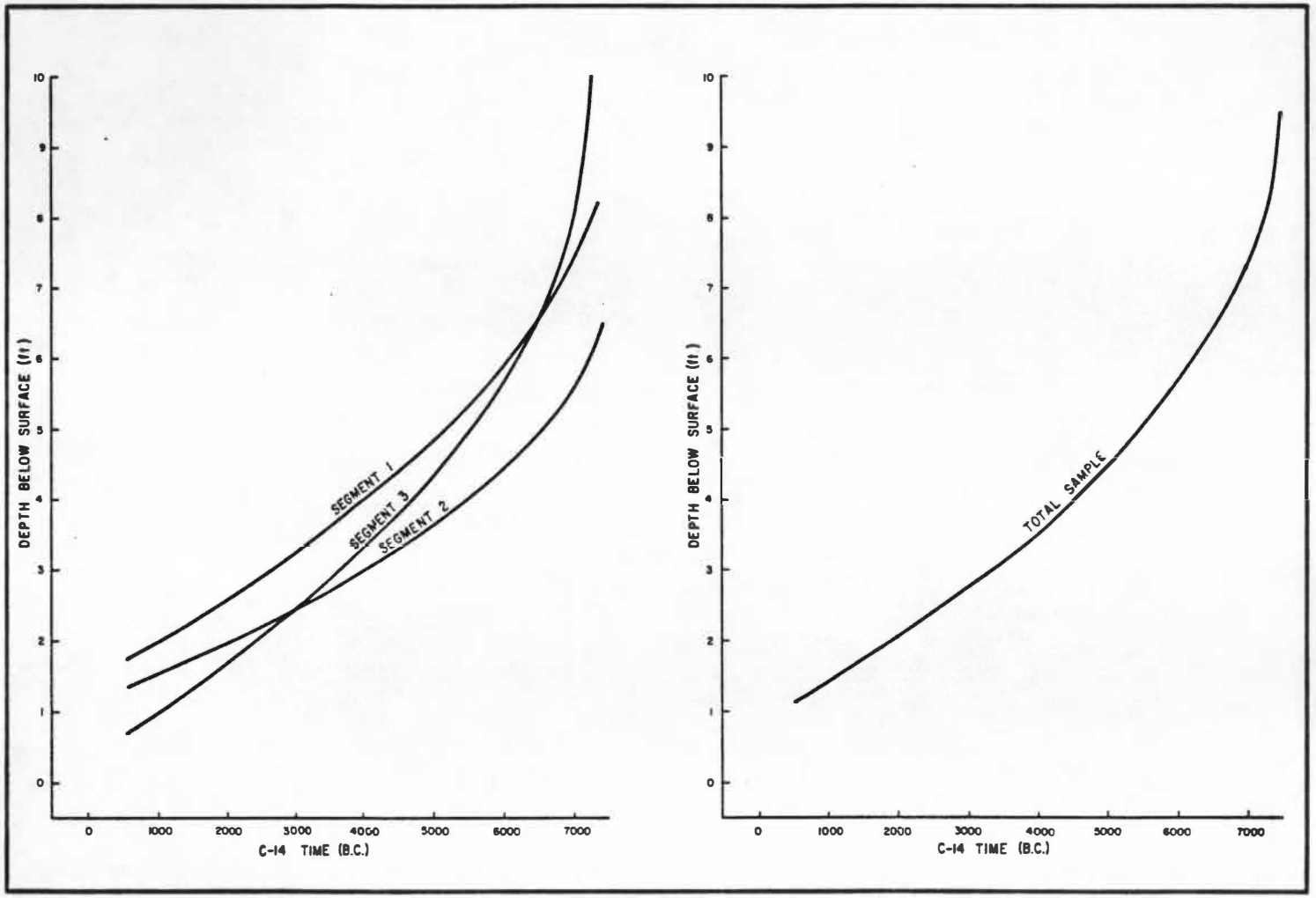


Figure 18. Regression models for Segment 1-3 subsamples and the entire buried site sample.

trend continues with Segment 3. In addition, the dissimilarity of the Segment 3 slope to the other two slopes suggests a slightly different and more complex geomorphic history of first terrace development within this portion of the valley. This model reflects the geomorphic diversity represented by the sites comprising this sample (i.e., point bars, eddys, backwater areas, etc.), and suggests extremely rapid alluviation prior to ca. 5,000 B.C.

Application of Regression Models

Following the completion of the regression analysis, regression functions were used to estimate the age (in radiocarbon years) of other buried archaeological deposits identified within the Tellico study area. These age estimates were then translated into more generalized cultural phases. The regression functions allowed the temporal classification of almost 120 additional components identified by buried site reconnaissance and deep testing between 1973 and 1979 (Table 37).

Since several of these components were from sites with other temporally identifiable components they provided an informal test of model accuracy. Specifically, if the three models provide reliable estimates of stratum age, then most estimates for strata contiguous to temporally identified components should reflect the correct stratigraphic superposition (e.g., the age estimate for a stratum immediately above a component dated at 6,000 B.C. should be more recent than 6,000 B.C.). Of the 19 cases within the buried site sample where unidentified components were situated in stratigraphic contiguity to temporally identified components, only one was obviously estimated

Table 37. Cultural phase classification of unidentified buried components following regression analysis.

Site	River Mile	Median Depth	Stratum Thickness	Estimated Date (B.C.)	Estimated[1] Cultural Phase
40LD9	12.0	6.5	1.0	6416	EA (L)
40LD9	12.0	9.9	0.5	>7253	EA (LK)?
40LD17	0.0	4.9	0.6	4989	MA (Und.)
40LD17	0.0	12.8	0.1	>7253	EA (LK)?
40LD20	7.0	6.0	1.0	6032	MA (S)
40LD20	7.0	8.3	0.1	>7253	EA (UK)?
40LD34	12.8	1.5	0.1	830	EW (WB)
40LD34	12.8	5.4	1.2	6869	EA (SA)
40LD34	12.8	6.5	0.9	>7253	EA (LK)?
40LD35	11.7	1.6	1.1	<577	EW (WB)
40LD35	11.7	2.4	0.7	1598	LA (I)
40LD35	11.7	3.3	1.1	2982	LA (SR)
40LD38	3.8	9.5	0.1	>7253	EA (LK)?
40LD39	4.9	6.2	0.1	6192	EA (L)
40LD39	4.9	8.1	0.1	>7253	EA (UK)?
40LD39	4.9	9.0	0.1	>7253	EA (LK)?
40LD39	4.9	10.9	0.1	>7253	EA (LK)?
40LD39	4.9	12.2	0.1	>7253	EA (LK)?
40LD39	4.9	14.0	0.1	>7253	EA (LK)?
40LD40	8.2	4.0	0.1	3932	MA (Und.)
40LD40	8.2	5.5	0.1	5592	MA (S)
40LD54	2.7	4.2	0.1	4182	MA (Und.)
40LD54	2.7	5.7	0.6	5775	MA (S)
40LD54	2.7	6.1	0.1	6113	EA (SA)
40LD54	2.7	6.6	0.1	6485	EA (SA)
40LD54	2.7	8.5	0.1	>7253	EA (UK)?
40LD68	11.5	1.9	1.8	750	EW (WB)
40LD68	11.5	5.0	1.0	5095	MA (MM)
40LD68	11.5	10.0	0.1	>7253	EA (LK)?
40LD69	11.0	11.5	0.1	>7253	EA (LK)?
40LD71	9.7	1.8	1.5	<577	EW (WB)
40LD71	9.7	6.7	0.1	6553	EA (SA)
40LD72	9.6	2.4	0.1	1598	LA (I)
40LD73	9.3	3.1	0.6	2691	LA (SR)
40LD73	9.3	7.9	2.2	>7253	EA (UK)
40LD73	9.3	9.5	1.0	>7253	EA (LK)
40LD73	9.3	11.5	0.1	>7253	EA (LK)
40LD75	9.8	2.6	0.9	1922	LA (I)
40LD75	9.8	3.5	0.7	3265	MA (Und.)
40LD77	10.1	3.6	0.4	3403	MA (Und.)

Table 37 Continued.

Site	River Mile	Median Depth	Stratum Thickness	Estimated Date (B.C.)	Estimated[1] Cultural Phase
40LD77	10.1	6.4	0.9	6343	EA (L)
40LD78	4.7	4.6	2.1	4657	MA (Und.)
40LD79	4.6	1.5	1.0	<577	EW (WB)?
40LD79	4.6	5.2	0.5	5301	MA (S)
40LD79	4.6	6.5	0.4	6416	EA (L)
40LD80	4.5	4.3	0.5	4304	MA (Und.)
40LD80	4.5	7.5	0.5	7012	EA (UK)
40LD80	4.5	12.0	0.1	>7253	EA (LK)
40LD82	8.3	4.6	0.7	4657	MA (Und.)
40LD83	8.1	2.5	1.0	1761	LA (I)
40LD83	8.1	8.0	0.5	7225	EA (UK)
40LD85	4.9	6.8	0.2	6618	EA (SA)
40LD85	4.9	7.8	0.2	7147	EA (UK)
40LD85	4.9	10.0	0.2	>7253	EA (LK)?
40LD86	5.2	6.0	0.1	6032	EA (L)
40LD86	5.2	11.3	0.1	>7253	EA (LK)?
40LD87	5.4	2.0	1.6	924	LA (I)
40LD87	5.4	3.1	0.6	2690	LA (SR)
40LD87	5.4	8.8	0.2	>7253	EA (UK)?
40LD88	6.5	7.0	0.1	6742	EA (SA)
40LD89	5.9	1.4	0.8	<577	EW (WB)?
40LD89	5.9	7.8	0.8	7147	EA (UK)
40LD90	12.2	4.0	0.1	3932	MA (Und.)
40LD90	12.2	8.1	0.4	>7253	EA (LK)?
40LD91	13.3	6.0	0.1	7233	EA (UK)
40LD91	13.3	10.5	0.1	>7253	EA (LK)?
40LD92	6.8	5.4	0.1	5497	MA (S)
40LD92	6.8	7.0	0.1	6742	EA (SA)
40LD92	6.8	12.2	0.1	>7253	EA (LK)?
40LD93	7.1	6.0	0.1	6032	MA (S)
40LD93	7.1	9.3	0.6	>7253	EA (LK)?
40LD94	7.6	2.7	0.6	2080	LA (I)
40LD94	7.6	10.0	0.1	>7253	EA (LK)?
40LD95	8.1	4.2	0.5	4183	MA (Und.)
40LD95	8.1	6.1	0.1	6113	EA (L)
40LD96	5.9	5.6	0.1	5685	MA (S)
40LD96	5.9	10.6	0.1	>7253	EA (LK)?
40LD98	14.8	1.5	1.4	830	EW (WB)
40LD98	14.8	4.4	0.1	5927	MA (S)
40LD98	14.8	7.7	1.0	>7253	EA (LK)?
40LD99	15.4	5.4	0.6	6869	EA (SA)

Table 37 Continued.

Site	River Mile	Median Depth	Stratum Thickness	Estimated Date (B.C.)	Estimated[1] Cultural Phase
40LD99	15.4	7.5	0.5	>7253	EA (LK)?
40LD99	15.4	8.5	0.7	>7253	EA (LK)?
40LD99	15.4	9.3	0.6	>7253	EA (LK)?
40LD99	15.4	10.9	0.1	>7253	EA (LK)?
40LD99	15.4	12.0	0.1	>7253	EA (LK)?
40LD100	15.6	6.5	0.1	>7253	EA (UK)?
40LD100	15.6	8.2	0.1	>7253	EA (LK)?
40LD101	16.0	5.5	1.0	6940	EA (SA)
40LD101	16.0	10.3	0.5	>7253	EA (LK)?
40MR7	30.9	4.8	0.1	-	?
40MR7	30.9	7.1	0.1	-	?
40MR25	26.4	1.7	0.1	-	?
40MR26	28.0	4.5	0.4	-	?
40MR26	28.0	9.0	0.1	-	?
40MR27	28.6	5.6	1.0	-	?
40MR27	28.6	10.1	0.1	-	?
40MR27	28.6	11.8	0.1	-	?
40MR28	29.2	3.1	0.4	-	?
40MR28	29.2	4.7	0.4	-	?
40MR28	29.2	9.7	0.3	-	?
40MR35	29.8	4.0	0.9	-	?
40MR35	29.8	5.8	0.7	-	?
40MR38	24.9	5.1	1.0	-	?
40MR38	24.9	6.5	0.8	-	?
40MR38	24.9	10.1	0.6	-	?
40MR64	20.5	9.0	0.1	7113	EA (UK)
40MR76	30.0	2.4	0.3	-	?
40MR76	30.0	4.0	0.4	-	?
40MR76	30.0	5.5	0.1	-	?
40MR76	30.0	7.4	0.1	-	?
40MR85	20.9	3.5	0.1	4140	MA (Und.)
40MR85	20.9	6.8	0.9	6575	EA (SA)
40MR85	20.9	8.3	0.6	7036	EA (UK)
40MR85	20.9	10.5	2.0	>7120	EA (LK)?
40MR86	21.8	7.4	0.7	6808	EA (SA)
40MR86	21.8	12.3	0.5	>7120	EA (LK)?
40MR87	18.5	4.6	0.2	6148	EA (L)
40MR87	18.5	5.7	1.0	7070	EA (UK)
40MR87	18.5	7.5	1.0	>7253	EA (LK)?
40MR87	18.5	11.5	0.2	>7253	EA (LK)?
40MR88	17.7	2.0	0.1	1960	LA (I)

Table 37 Continued.

Site	River Mile	Median Depth	Stratum Thickness	Estimated Date (B.C.)	Estimated[1] Cultural Phase
40MR88	17.7	4.5	0.1	6040	EA (L)
40MR88	17.7	5.5	0.1	6940	EA (SA)
40MR89	19.0	2.7	0.1	3366	MA (Und.)
40MR89	19.0	4.4	0.9	5927	MA (S)
40MR89	19.0	7.5	0.1	>7253	EA (LK)?
40MR91	17.1	4.0	1.0	5433	MA (MM)
40MR91	17.1	8.0	0.1	>7253	EA (LK)?
40MR93	17.4	12.0	0.1	>7253	EA (LK)?
40MR162	23.6	2.5	1.0	3016	MA (Und.)
40MR162	23.6	4.5	1.0	5084	MA (MM)
40MR162	23.6	6.0	0.6	6164	EA (L)
40MR162	23.6	7.7	0.1	6900	EA (SA)
40MR165	23.4	3.0	1.5	3600	MA (Und.)
40MR165	23.4	7.7	0.2	6900	EA (SA)
40MR175	22.2	7.5	0.1	6840	EA (SA)
40MR183	20.0	5.0	0.1	5489	MA (MM)
40MR193	26.5	2.7	0.6	-	?
40MR193	26.5	3.6	0.4	-	?
40MR193	26.5	6.8	0.1	-	?

[1]See Table 30 for key to cultural phase codes.

incorrectly. In this instance, a component just beneath a Stanly zone (ca. 6,000-5,500 B.C.) yielded an age estimate of 5,301 B.C.

Summary

Given this informal test of the derived models, it would appear that the least-squares regression approach has merit; however, it would be erroneous to simply ascribe the absolute age estimate to the sample. Instead, the variability inherent within the data (as measured by R^2 and reflecting local geomorphic differences between buried sites), and the use of radiocarbon dating to estimate time, both suggest a more generalized interpretation of the regression results. For this reason, age estimates were used to classify components into cultural phases, most of which represent approximately 500-year time spans. Whereas components assigned to different phases are considered to lack contemporaneity, the same can not be said for components with different age estimates that are assigned to the same phase.

CHAPTER VI

ANALYSIS OF LAND USE PATTERNS

In this chapter, data generated by probabilistic survey sampling of valley and upland landforms within the lower Little Tennessee River valley are analyzed for the purpose of drawing general conclusions about aboriginal land use. Land use is defined as the manner in which a cultural system articulates with the natural environment. Articulation relates primarily to: 1) the direct extraction from the environment of resources needed for subsistence and manufacture of necessary tools (tool being considered in its broadest sense); and 2) maintenance activities associated with sustaining a residential population through the preparation and distribution of subsistence goods, and actual tool manufacture and use (see Binford and Binford 1966:268).

This study is concerned with the spatial pattern or structure of land use within the lower Little Tennessee River valley. The expectation that such patterning exists and can be profitably studied from an archaeological perspective is based on the premises that: 1) available and necessary resources are not uniformly distributed within the environment; 2) human adaptative systems are internally differentiated in part to cope with these spatial inequalities; and 3) spatially organized adaptive responses to differential resource distributions will be reflected in the archaeological record in terms of both artifact density and content.

Unlike most land use studies that deal explicitly with

ethnobotanical or zooarchaeological data in order to propose ecological reconstructions (for example, see Cridlebaugh 1984), the present study considered land use from an archaeological perspective. Man-land interaction was interpreted from the material remains that comprise the surface-derived archaeological record and their distributions across the landscape. Because of the harsh effects of both chemical and mechanical weathering upon artifacts within the plowzone, the survey sample consisted solely of non-perishable lithic and ceramic artifacts.

Interpretations of land use patterns were based on spatial distributions of individual artifact categories and groups of categories, rather than upon the distribution of spatial clusters of artifacts, or sites. This methodological position recently has been espoused by Dunnell and Dancey (1983:272) who argue that "the archaeological record is most usefully conceived as a more or less continuous distribution of artifacts over the land surface with highly variable density characteristics." By avoiding the conceptual constraints imposed by the notion of "site," it was possible to consider more fully the total range of recoverable archaeological residues, not just those that were densely clustered. Since the analysis was equally interested in past behavior comprising "off-site" activities (primarily resource extraction), the use of "site" as an analytical unit was both unnecessary and cumbersome.

From a more practical standpoint, a "non-site" approach to land use studies also offered certain analytical advantages which a more traditional "site-based" approach lacked. Except under rare

circumstances, it was impossible to provide a strong case that the physical association of artifacts occurring at the surface (usually recognized as a site) was a direct manifestation of the systemic context in which those artifacts functioned. Surface collections simply represent a poor basis for identifying complexes of functionally interrelated artifacts, or toolkits. This is because: 1) most sites are the products of multiple occupations; 2) site surfaces usually are disturbed, thereby eliminating any geologic potential for demonstrating temporal associations of artifacts or identifying temporally discrete sets of artifacts representing individual occupations; and 3) the overwhelming majority of artifacts that comprise the archaeological record, as seen through surface collections, cannot be temporally identified with any degree of specificity using morphological, technological, mineralogical, or stylistic attributes. Given the additional problem that surface collections are unlikely to comprise representative artifact samples except when collected from comparatively dense sites (see Baden 1982b), a more regional perspective that considers artifact distributions across broadly defined zones of geographical space was more preferable to one based on individual, and often poorly sampled, sites.

The probabilistic archaeological survey of the study area resulted in the collection of 65,422 aboriginal artifacts. These artifacts were recovered from 262 (or 61.6%) of the 425 sampling units, and represented 48 separate formal/stylistic categories (not including individual projectile point and ceramic types) (Table 38).

Table 38. Distribution of surface-collected artifacts by sampling domain.

Artifact Category	Alluvial Terraces	Lower Valley Uplands	Upper Valley Uplands	Dissected Knobs	Total
Hammerstone	8	-	2	2	12
Pitted Cobble	56	1	4	4	65
Primary Decort. Flake	729	8	266	148	1151
Secondary Decort. Flake	2429	34	1143	599	4205
Amorphous Core	109	5	71	38	223
Biface	188	8	81	51	328
Preform	58	2	11	12	83
Bifacial Thinning Flake	7912	94	1848	1491	11,345
Bipolar Flake	908	31	370	306	1615
Bipolar Core	70	8	86	61	225
Blade	148	6	56	51	261
Blade Core	13	-	6	3	22
Shatter Fragment	2445	89	1363	761	4658
Interior Flake	263	3	96	52	414
Chipped Stone (Indet.)	2	-	-	-	2
Ground Stone (Indet.)	5	-	2	1	8
Tested Nodule	6	-	24	10	40
Utilized Mineral	22	2	4	6	34
Projectile Point	252	17	87	75	431
Atlatl Weight	-	-	-	1	1
Bifacial Knife	5	-	1	-	6
Side Scraper	10	-	5	2	17
Retouched Flake	97	4	41	25	167
Utilized Flake	903	17	291	162	1373
Chopper	15	1	2	-	18
Chopper/Scraper	14	-	-	-	14
End Scraper	20	-	8	8	36
Perforator	6	-	3	4	13
Drill	9	1	3	1	14
Spokeshave	9	-	2	2	13
Denticulate	10	1	3	1	15
Pièce Esquillée	58	2	21	9	90
Graver	6	-	9	1	16
Ground Celt	10	1	3	-	14
Grooved Axe	-	-	-	1	1
Adze	-	-	1	-	1
Chisel	1	-	-	-	1
Mano	2	-	-	-	2
Milling Stone	-	-	1	-	1
Pestle	1	-	-	-	1
Nutting Stone	1	-	-	-	1
Netsinker	57	1	1	23	82
Earspool	1	-	-	-	1
Bar Gorget	4	-	-	1	5
Fire-cracked Rock	23,904	74	914	12,619	37,511
Daub	72	-	-	4	76
Potsherd	784	1	-	0	785
Stone Sherd	20	-	-	5	25
Total	41,642	411	6829	16,540	65,422

Artifacts were recovered from all landforms sampled by the survey (Figure 19). Lithic artifact classification followed a format developed by Kimball (1982) and considered attributes of working edge, blank, and raw material. Ceramic artifacts were classified by an analysis system developed in Chapter V. These artifact categories are discussed below in terms of inferred artifact function and spatial distribution.

Behavioral implications of each artifact category related to land use patterning was considered in three ways. First, each category was evaluated in terms of the general type of activity or task that it is associated with. Although specific functional interpretations were not possible in the absence of detailed microwear analyses (see Keeley 1980), more general characterizations based on morphological and macroscopic working edge characteristics are presented. In this manner, the 48 artifact categories were functionally interpreted and combined into 19 distinct activity groups. Second, each artifact category was considered within an organizational/systemic context. For instance, lithic tools were classified either as personal gear, situational gear, or site furniture. Each of these categories has specific implications for how and where a tool functioned within a systemic context and ultimately entered an archaeological context (Binford 1979). Third, by defining each category in terms of its organizational/systemic context, it was possible to anticipate its archaeological distribution within a settlement context. Anticipated settlement contexts used in the study followed Binford (1980) and are as follows: residential site, field camp, and extraction locus.

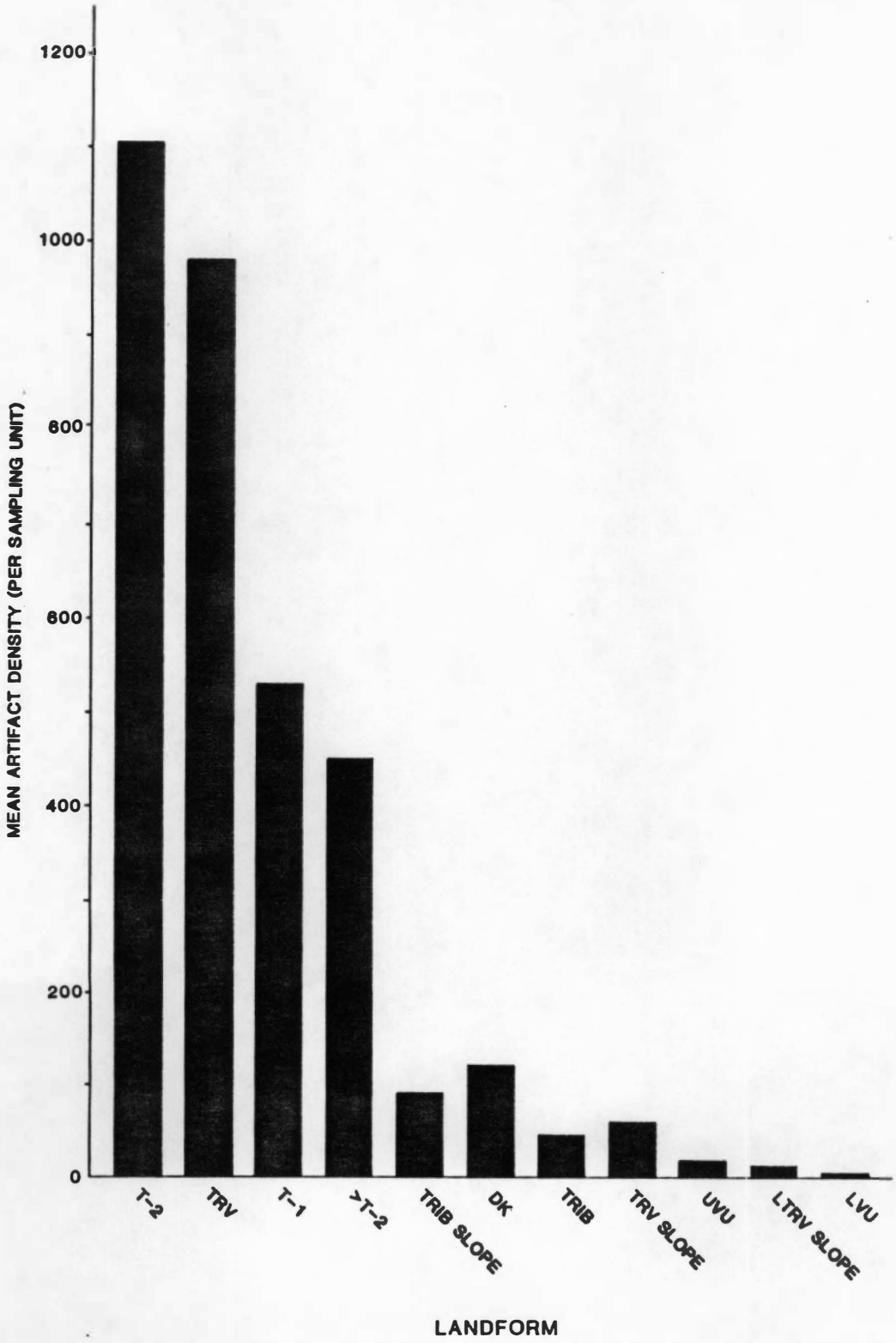


Figure 19. Distribution of mean artifact density by landform.

Residential sites are what Wilmsen (1970:75) has referred to as "multiple activity locations" and include a variety of site types from base camps to villages; conversely, field camps can be characterized as "limited activity locations." Extraction loci represent locations of "off-site" activities. The behavioral implications of the artifact categories used in this study are summarized in Table 39.

Artifacts recovered by the probabilistic survey are described and discussed below.

FLINTKNAPPING TOOLS

Hammerstones (Figure 20a-c)

Sample Size: 12.

Sampling Domain Distribution: 8 Alluvial Terraces, 2 Upper Valley Uplands, 2 Dissected Knobs.

Raw Material Distribution: 8 Quartzite, 2 Chalcedony, 1 Conglomerate, 1 Quartz.

Description: A hammerstone is a cobble or cobble spall that exhibits abrasion along one or more edges, indicating use as a percussor. The majority of the hammerstones recovered during the survey probably were used in stone tool manufacture.

Pitted Cobble (Figure 20d-g)

Sample Size: 65.

Sampling Domain Distribution: 56 Alluvial Terraces, 1 Lower Valley Uplands, 4 Upper Valley Uplands, 4 Dissected Knobs.

Raw Material Distribution: 49 Quartzite, 11 Conglomerate, 2 Sandstone, 1 Quartz, 1 Metasandstone, 1 Metaquartzite.

Table 39. Summary of artifact categories used in land use analysis.

ACTIVITY/Artifact Category	Organizational/Syatemic Context	Anticipated Archaeological Context
FLINTKNAPPING		
Hammerstone	Site Furniture (Cached Item)	Residential Site/Logistical Camp
Pitted Cobble	Site Furniture (Cached Item)	Residential Site/Logistical Camp
PRIMARY LITHIC REDUCTION		
Primary Decort. Flake	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp
Secondary Decort. Flake	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp
Amorphous Core	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp
BIFACIAL LITHIC REDUCTION		
Biface	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp
Preform	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp
Bifacial Thinning Flake	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp/ Extraction Locus
BIPOLAR LITHIC REDUCTION		
Bipolar Flake	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp/ Extraction Locus
Bipolar Core	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp/ Extraction Locus
BLADE REDUCTION		
Blade	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp/ Extraction Locus
Blade Core	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp
NON-SPECIFIED LITHIC REDUCTION		
Shatter Fragment	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp/ Extraction Locus
Interior Flake	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp
Chipped Stone (Indet.)	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp
Ground Stone (Indet.)	Stone Tool Manufacturing Debris	Residential Site/Logistical Camp
RAW MATERIAL ACQUISITION/UTL.		
Tested Nodule	Procured Resource (Discarded)	Extraction Locus
Utilized Mineral	Procured Resource (Waste/Exhausted)	Residential Site
HUNTING		
Projectile Point	Personal Gear (Formal Tool)	Residential Site or Logistical Camp (replaced)/Extraction Locus (lost)
Atlatl Weight	Personal Gear (Formal Tool)	Residential Site
CUTTING		
Bifacial Knife	Personal Gear (Formal Tool)	Residential Site/Logistical Camp
Side Scraper	Personal Gear (Formal Tool)	Residential Site/Logistical Camp
Retouched Flake	Situational Gear (Ad Hoc Tool)	Residential Site/Logistical Camp/ Extraction Locus
Utilized Flake	Situational Gear (Ad Hoc Tool)	Residential Site/Logistical Camp/ Extraction Locus
HEAVY BUTCHERING		
Chopper	Site Furniture	Residential Site/Logistical Camp
Chopper/scraper	Site Furniture	Residential Site/Logistical Camp
HIDE WORKING		
End Scraper	Personal Gear (Formal Tool)	Residential Site/Logistical Camp
Perforator	Situational Gear (Ad Hoc Tool)	Residential Site/Logistical Camp
NON-LITHIC TOOL MANUFACTURE		
Drill	Personal Gear (Formal Tool)	Residential Site/Logistical Camp
Spokeshave	Situational Gear (Ad Hoc Tool)	Residential Site/Logistical Camp
Denticulate	Situational Gear (Ad Hoc Tool)	Residential Site/Logistical Camp
Pièce Esquillée	Situational Gear (Ad Hoc Tool)	Residential Site/Logistical Camp
Graver	Situational Gear (Ad Hoc Tool)	Residential Site/Logistical Camp
HEAVY WOODWORKING		
Ground Celt	Personal Gear (Formal Tool)	Residential Site/Logistical Camp
Grooved Axe	Personal Gear (Formal Tool)	Residential Site/Logistical Camp
Adze	Personal Gear (Formal Tool)	Residential Site/Logistical Camp
Chisel	Personal Gear (Formal Tool)	Residential Site/Logistical Camp
PLANT FOOD PROCESSING		
Mano	Site Furniture (Cached Item)	Residential Site/Logistical Camp
Milling Stone	Site Furniture (Cached Item)	Residential Site/Logistical Camp
Pestle	Site Furniture (Cached Item)	Residential Site/Logistical Camp
Nutting Stone	Site Furniture (Cached Item)	Residential Site/Logistical Camp
FISHING		
Netsinker	Site Furniture (Cached Item)	Residential Site/Logistical Camp
PERSONAL ADORNMENT		
Earspool	Personal Gear (Broken/Lost)	Residential Site
Bar Gorget	Personal Gear (Broken/Lost)	Residential Site
HEARTH USE		
Fire-cracked Rock	Hearth Debris	Residential Site/Logistical Camp
HOUSE CONSTRUCTION		
Daub	Architectural Debris	Residential Site
COOKING		
Potsherd	Site Furniture (Fragment)	Residential Site
Stone Sherd	Site Furniture (Fragment)	Residential Site

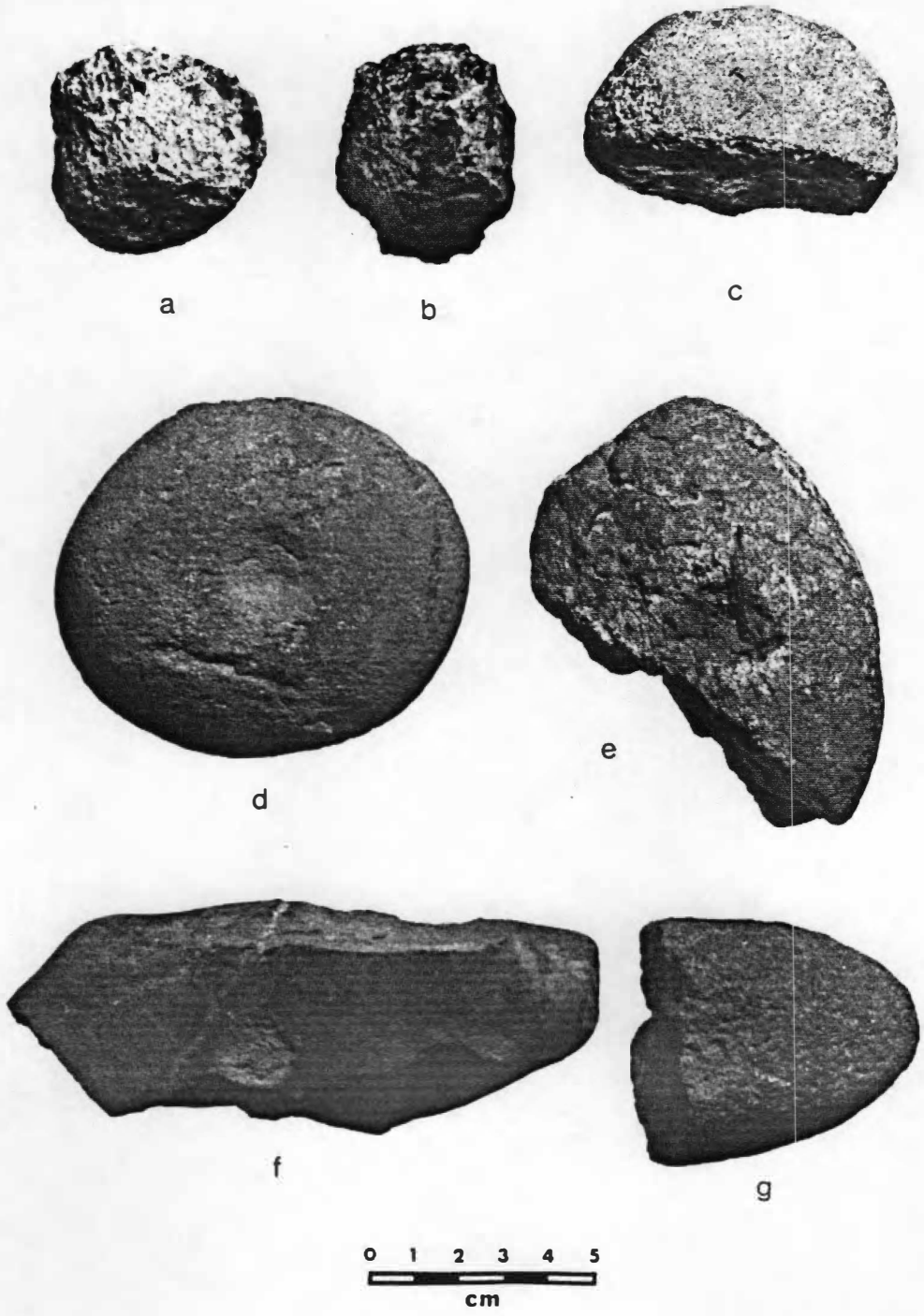


Figure 20. Flintknapping tools. Hammerstones (a-c) and pitted cobbles (d-g).

Description: A pitted cobble is a cobble or cobble spall that exhibits battered depressions on one or both faces. These implements probably functioned as anvils for bipolar lithic reduction (Chapman 1975:162-164). It is also possible that some pitted cobbles were a product of nut processing.

Distribution and Summary

Flintknapping tools, though relatively infrequent in number, were recovered from all sampling domains. The majority (n=64), however, were found within the Alluvial Terraces domain and 88.3% came from alluvial valley landforms (Table 40). Both hammerstones and pitted cobbles were identifiable largely because they had been subjected to repeated use. It is likely that numerous other ad hoc implements which served similar functions went undetected by both survey and analysis due to a lack of recognizable, patterned use wear. Repeated use of these implements indicates either curation behavior or intensive flintknapping activity. Both imply that a majority of these artifacts entered the archaeological record at habitation loci rather than at resource extraction loci, with the obvious exception of quarry sites. Flintknapping tools were regarded as site furniture because of their comparatively large size, and probably were cached at residential camps and field camps rather than being transported between sites. These tools comprised 39.3% of all artifacts classified as site furniture.

Table 40. Distribution of flintknapping tools by landform.

Landform	Hammerstone n	Hammerstone $\bar{x}$	Pitted Cobble n	Pitted Cobble $\bar{x}$
T-1 Terrace (LTRV)	4	.13	21	.66
T-2 Terrace (LTRV)	2	.20	16	1.60
>T-2 Terrace (LTRV)	0	.00	15	.56
L. Tenn. Valley Slope	1	.03	1	.03
Tellico River Valley	3	.18	7	.41
Tellico Valley Slope	0	.00	1	.11
Tributary Valley	1	.03	1	.03
Tributary Valley Slope	0	.00	0	.00
Lower Valley Uplands	0	.00	0	.00
Upper Valley Uplands	1	.01	2	.01
Dissected Knobs	0	.00	1	.09
Total	12		65	
Overall $\bar{X}$		.03		.15

Note: $\bar{x}$ = mean artifact density (per sampling unit).

PRIMARY REDUCTION RESIDUE

Primary Decortication Flake

Sample Size: 1,151.

Sampling Domain Distribution: 729 Alluvial Terraces, 8 Lower Valley Uplands, 266 Upper Valley Uplands, 148 Dissected Knobs.

Raw Material Distribution: 577 Knox Black Chert, 177 Knox Black Banded Chert, 144 Knox Dark Gray Chert, 179 Knox Light Gray Banded Chert, 19 Quartz, 14 Knox Chert Cortex, 11 Knox Porcellaneous Chert, 8 Chalcedony, 6 Knox Oolitic Chert, 5 Other Chert (Local), 4 Knox Mottled Chert, 3 Other Chert (Non-local).

Description: A primary decortication flake is any flake resulting from the initial stage of core or nodule reduction, exhibiting a striking platform, bulb of percussion, and having over 75% of cortex remaining on the dorsal surface (Kimball 1982:145).

Secondary Decortication Flake

Sample Size: 4,205.

Sampling Domain Distribution: 2,429 Alluvial Terraces, 34 Lower Valley Uplands, 1,143 Upper Valley Uplands, 599 Dissected Knobs.

Raw Material Distribution: 1,929 Knox Black Chert, 814 Knox Black Banded Chert, 551 Knox Dark Gray Chert, 365 Knox Light Gray Chert, 338 Knox Light Gray Banded Chert, 73 Quartz, 44 Chalcedony, 39 Knox Porcellaneous Chert, 14 Other Chert (Local), 13 Knox Oolitic Chert, 12 Knox Mottled Chert, 6 Other Chert (Non-local), 3 Knox Dark Gray Banded Chert, 2 Quartzite, 2 Slate.

Description: A secondary decortication flake is any flake

resulting from a secondary stage of core or nodule reduction, exhibiting a striking platform and bulb of percussion, and having less than 75% of cortex remaining on the dorsal surface.

Amorphous Core (Figure 21a-f)

Sample Size: 223.

Sampling Domain Distribution: 109 Alluvial Terraces, 5 Lower Valley Uplands, 71 Upper Valley Uplands, 38 Dissected Knobs.

Raw Material Distribution: 77 Knox Black Chert, 75 Knox Black Banded Chert, 27 Quartz, 15 Knox Dark Gray Chert, 11 Chalcedony, 10 Knox Light Gray Banded Chert, 3 Quartzite, 3 Knox Light Gray Chert, 1 Knox Oolitic Chert, 1 Knox Porcellaneous Chert.

Description: An amorphous core is an irregular nucleus of lithic material resulting from an indeterminate reduction strategy (Kimball 1982:146).

Distribution and Summary

Both primary and secondary decortication flakes represent by-products of initial flintknapping activities to produce either bifaces, prepared cores for further reduction by bipolar or blade techniques, or flake blanks suitable for further edge modification into tools. Most amorphous cores, conversely, probably represent exhausted masses from which flake blanks were removed. Flintknapping (particularly primary reduction) is associated largely with activities to replace exhausted, broken, or worn out tools, or to gear up for anticipated future tool needs (Binford 1979:268; also see Kimball 1981:26). As such, these artifacts can be expected to occur primarily

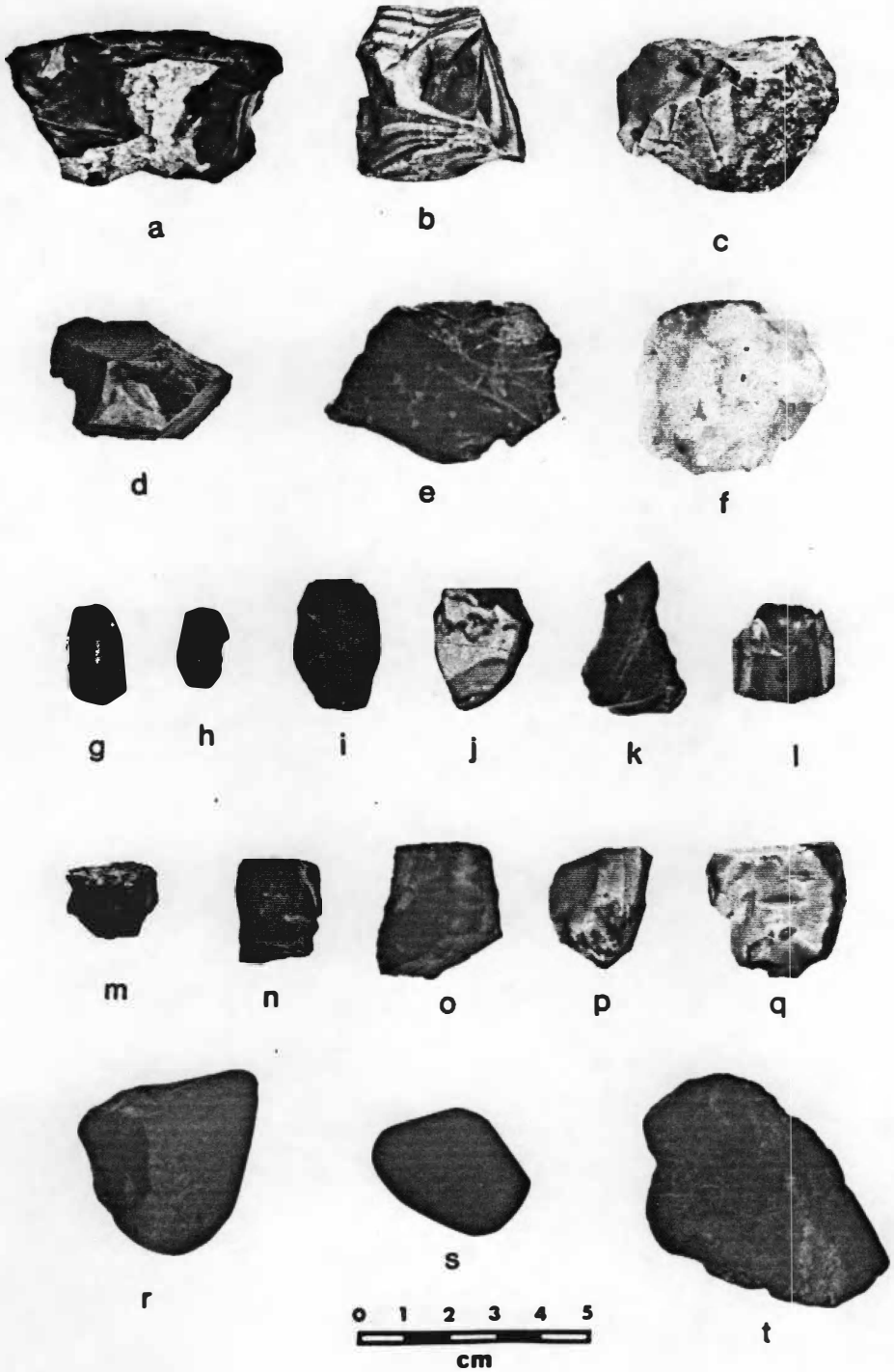


Figure 21. Cores and acquired raw materials. Amorphous cores (a-f); bipolar cores (g-l); blade cores (m-q); tested nodule (r); worked phyllite (s); and faceted hematite (t).

at base camp or hunting camp locations. Because much of the locally available cherts within the Tellico study area occur as small nodules, it is also possible that nodules may have been carried on hunting expeditions as readily available sources of lithic material for manufacturing ad hoc butchering tools.

Primary reduction residue comprised almost 23% of all unmodified debitage recovered by probabilistic survey. Although present in all sampling domains, the majority of decortication flakes and amorphous cores were found on alluvial terraces of the Little Tennessee and Tellico rivers (Table 41). The sample of artifacts from the Upper Valley Uplands domain, though comparatively large, was comprised mostly of artifacts from a few sampling units situated near Knox Chert outcrops at RM 21 of the Little Tennessee River and along Tellico River and Ninemile Creek. In fact, six sampling units (SU 646, 647, 677, 687, 689, and 693) comprising only three percent of the Upper Valley Uplands sample produced over 36% of all unmodified primary reduction debitage from that domain.

BIFACIAL REDUCTION RESIDUE

Biface (Figure 22a-d)

Sample Size: 328.

Sampling Domain Distribution: 188 Alluvial Terraces, 8 Lower Valley Uplands, 81 Upper Valley Uplands, 51 Dissected Knobs.

Raw Material Distribution: 96 Knox Black Chert, 75 Quartz, 58 Knox Black Banded Chert, 35 Knox Dark Gray Chert, 32 Knox Light Gray Banded Chert, 11 Knox Light Gray Chert, 11 Chalcedony, 3 Other Chert

Table 41. Distribution of primary reduction residue by landform.

Landform	Primary Decortication Flake n	Primary Decortication Flake $\bar{x}$	Secondary Decortication Flake n	Secondary Decortication Flake $\bar{x}$	Amorphous Core n	Amorphous Core $\bar{x}$
T-1 Terrace (LTRV)	195	6.09	765	23.91	35	1.09
T-2 Terrace (LTRV)	95	9.50	434	43.40	23	2.30
>T-2 Terrace (LTRV)	408	15.11	1154	42.74	48	1.78
L. Tenn. Valley Slope	17	.52	53	1.61	9	.27
Tellico River Valley	159	9.35	597	35.12	28	1.65
Tellico Valley Slope	19	2.11	46	5.11	5	.56
Tributary Valley	48	1.66	190	6.55	20	.69
Tributary Valley Slope	136	4.69	584	20.14	27	.93
Lower Valley Uplands	2	.02	10	.12	4	.05
Upper Valley Uplands	67	.47	337	2.37	17	.12
Dissected Knobs	5	.45	35	3.18	7	.64
Total	1151		4205		223	
Overall $\bar{X}$		2.71		9.89		.52

Note: $\bar{x}$ = mean artifact density (per sampling unit).

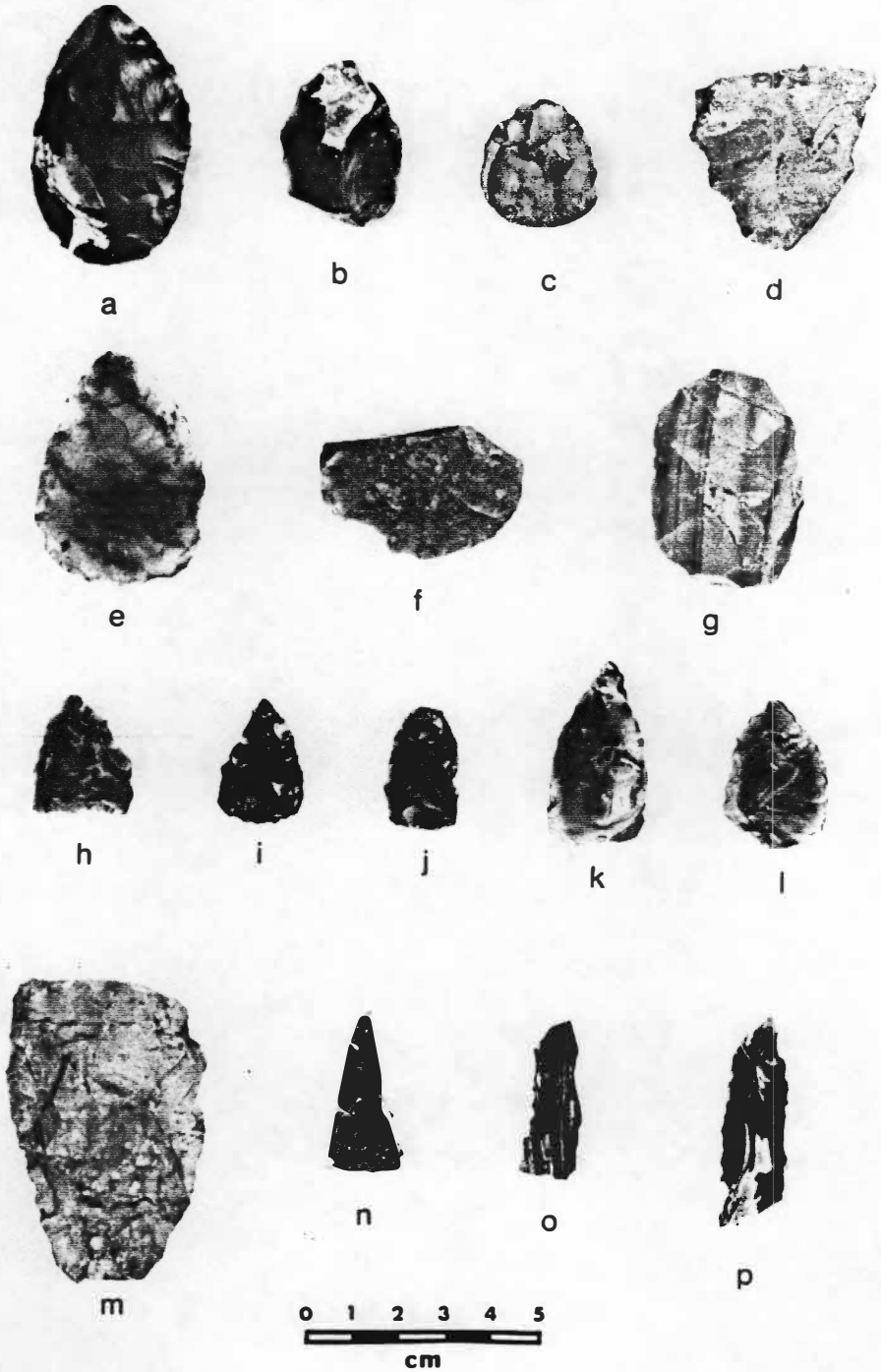


Figure 22. Bifaces and preforms. Bifaces (a-d); Archaic proj. pt. preforms (e-g); Woodland-Mississippian proj. pt. preforms (h-j); misc. preforms (k-l); knife preform (m); and drill preforms (n-p).

(Local), 2 Other Chert (Non-local), 2 Knox Porcellaneous Chert, 1 Knox Mottled Chert, 1 Knox Oolitic Chert, 1 Slate.

Description: A biface is defined as a blank that exhibits flake removal scars on both surfaces, detached by either percussion or pressure flaking (Kimball 1982:145). With the exception of cached bifacial blanks, artifacts classified as bifaces mostly represent unfinished tools that were terminated during manufacture because of flaws in the material or breakage. Thirteen of the bifaces recovered during survey had subsequent flakes removed by bipolar technique.

Preform (Figure 22e-p)

Sample Size: 83.

Sampling Domain Distribution: 58 Alluvial Terraces, 2 Lower Valley Uplands, 11 Upper Valley Uplands, 12 Dissected Knobs.

Raw Material Distribution: 18 Quartz, 18 Knox Black Banded Chert, 16 Knox Black Chert, 15 Knox Dark Gray Chert, 4 Knox Light Gray Banded Chert, 4 Knox Light Gray Chert, 3 Chalcedony, 2 Knox Mottled Chert, 2 Other Chert (Non-local), 1 Other Chert (Local).

Description: A preform is a biface that exhibits final stages of reduction and shaping, but which lacks modification of the hafting area. As with other bifaces, preforms represent unfinished tools that were either lost, cached for later modification and use, or discarded due to breakage. Since most are projectile points that were terminated following final shaping, it was often possible to predict the general type of point being manufactured. Archaic, Woodland, and Mississippian period preforms are all represented in the sample.

Bifacial Thinning Flake

Sample Size: 11,345.

Sampling Domain Distribution: 7,912 Alluvial Terraces, 94 Lower Valley Uplands, 1,848 Upper Valley Uplands, 1,491 Dissected Knobs.

Raw Material Distribution: 4,453 Knox Black Chert, 1,604 Knox Dark Gray Chert, 1,537 Knox Black Banded Chert, 1,325 Knox Light Gray Banded Chert, 946 Knox Light Gray Chert, 880 Quartz, 196 Chalcedony, 117 Knox Mottled Chert, 90 Other Chert (Local), 83 Knox Porcellaneous Chert, 50 Knox Oolitic Chert, 35 Other Chert (Non-local), 24 Quartzite, 1 Rhyolite, 1 Shale, 1 Granite, 1 Limestone, 1 Metadiorite.

Description: A bifacial thinning flake is defined as any flake that has been detached from a mass (i.e., biface) that has been bifacially shaped by either direct or indirect percussion. Bifacial thinning flakes are usually expanding toward the distal end, exhibit evidence of a bifacially worked edge at the platform (when present), possess multiple flake scars on the dorsal surface, and often lack any evidence of nodule cortex. Within the sequence of tool manufacture, bifacial thinning flakes represent a stage subsequent to primary reduction. Bifacial thinning flakes may also represent either tool edge rejuvenation or tool recycling.

Distribution and Summary

Bifacial reduction residue is associated largely with the production of hafted bifaces, namely projectile points and bifacial knives. Since such activity occurs primarily while "gearing up" for anticipated use, bifacial residue (particularly terminated bifaces and preforms) are expected to be highly correlated with residential sites

and, secondarily, with temporary hunting camps. The discarding of bifacial thinning flakes as by-products of edge rejuvenation and recycling may show a more dispersed spatial distribution, reflecting the manufacture and use of situational gear (Binford 1979:266).

Bifacial reduction debris comprised almost half (47.9%) of all unmodified debitage and aborted blanks recovered by probabilistic survey. A majority of all artifact classes were recovered along the alluvial terraces of the Little Tennessee and Tellico rivers; conversely, only 11.2% of bifaces and preforms and 8.1% of recovered bifacial thinning flakes came from upland landforms (Table 42). Almost two thirds (63.6%) of the upland artifacts (from Lower Valley Uplands, Upper Valley Uplands, and Dissected Knobs) were collected from four sampling units located near Knox Chert outcrops (SU 646, 647, 677, 693), thus making the disparity in artifact distribution between valley and upland landforms that much more striking.

As with primary reduction debitage, raw material distributions show a heavy reliance upon locally available cherts, quartz, quartzite, and chalcedony. Overall, nonlocal lithic materials were represented by only 0.4% of the bifacial reduction residue recovered from the survey.

BIPOLAR REDUCTION RESIDUE

Bipolar Flake

Sample Size: 1,615.

Sampling Domain Distribution: 908 Alluvial Terraces, 31 Lower Valley Uplands, 370 Upper Valley Uplands, 306 Dissected Knobs.

Table 42. Distribution of bifacial reduction residue by landform.

Landform	Biface		Archaic Preform		Woodland Preform		Miss. Preform		Misc. Preform		Bifacial Thinning Flake	
	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
T-1 Terrace (LTRV)	70	2.19	5	.16	0	.00	6	.19	14	.44	2070	64.69
T-2 Terrace (LTRV)	28	2.80	1	.10	0	.00	2	.20	4	.40	1567	156.70
>T-2 Terrace (LTRV)	76	2.81	10	.37	0	.00	1	.04	12	.44	4071	150.78
L. Tenn. Valley Slope	9	.27	1	.03	0	.00	0	.00	1	.03	120	3.64
Tellico River Valley	53	3.12	4	.23	0	.00	1	.06	7	.41	1422	83.65
Tellico Valley Slope	7	.78	0	.00	0	.00	0	.00	0	.00	110	12.22
Tributary Valley	7	.24	0	.00	0	.00	0	.00	3	.10	259	8.93
Tributary Valley Slope	38	1.31	2	.07	1	.03	0	.00	2	.07	812	28.00
Lower Valley Uplands	5	.06	1	.01	0	.00	0	.00	0	.00	25	.29
Upper Valley Uplands	33	.23	0	.00	0	.00	0	.00	3	.02	737	5.19
Dissected Knobs	2	.18	0	.00	0	.00	0	.00	2	.18	152	13.82
Total	328		24		1		10		48		11,345	
Overall $\bar{x}$		.77		.06		<.01		.02		.11		26.69

Note: $\bar{x}$ = mean artifact density (per sampling unit).

Raw Material Distribution: 795 Knox Black Chert, 333 Knox Black Banded Chert, 199 Knox Dark Gray Chert, 102 Knox Light Gray Chert, 96 Knox Light Gray Banded Chert, 62 Quartz, 10 Chalcedony, 8 Knox Mottled Chert, 4 Knox Oolitic Chert, 2 Other Chert (Local), 2 Other Chert (Non-local), 1 Knox Porcellaneous Chert, 1 Quartzite.

Description: A bipolar flake is an elongate flake detached from a mass by bipolar percussion. Bipolar flakes exhibit crushing at opposing ends and often possess bidirectional compression rings. Bipolar reduction represents a method of producing usable flake blanks from small chert nodules (see Hayden 1980). As such, bipolar flakes represent potential products rather than byproducts of the technique. The recognized occurrence of a bipolar tradition throughout the cultural sequence within the lower Little Tennessee River valley (see Chapman 1975; Boyd 1982) reflects a deep-rooted strategy for effectively exploiting a locally plentiful lithic resource comprised of small chert nodules (i.e., Knox formation cherts).

Bipolar Core (Figure 21g-1)

Sample Size: 225.

Sampling Domain Distribution: 70 Alluvial Terraces, 8 Lower Valley Uplands, 86 Upper Valley Uplands, 61 Dissected Knobs.

Raw Material Distribution: 105 Knox Black Chert, 73 Knox Black Banded Chert, 24 Knox Dark Gray Chert, 9 Knox Light Gray Chert, 8 Knox Light Gray Banded Chert, 2 Chalcedony, 2 Other Chert (Non-local), 1 Other Chert (Local), 1 Knox Oolitic Chert.

Description: A bipolar core is a nucleus that has been reduced by bipolar reduction. Bipolar cores are distinguished from bipolarly

manufactured pièces esquillées by a lack of regularly placed, repeated blows forming sharp perpendicular working edges (see discussion below of Bone Working Implements).

Distribution and Summary

Unlike primary and bifacial reduction techniques, the bipolar technique of lithic reduction represents a method for producing usable flake blanks from small and otherwise unusable nodules. Since bipolar reduction is a comparatively wasteful strategy in terms of the number of usable flakes that can be obtained from a nucleus or bipolar core, bipolar residue can be expected to be more prevalent near available lithic sources. This expectation is supported by Boyd's (1982) study of lithic artifacts from the Early Mississippian Martin Farm and Jones Ferry sites. Almost 30% of all lithic debris from Martin Farm, situated within a mile of Knox Chert outcrops, resulted from bipolar reduction whereas just over 15% of the sample from Jones Ferry, located 7.5 mi upstream from Martin Farm, consisted of bipolar residue.

A total of 1,840 bipolar flakes and cores was recovered. Bipolar reduction residue represented approximately 7.5% of all unmodified debitage recovered and was common in all sampling domains except the Lower Valley Uplands. However, most artifacts within this category were recovered from alluvial terraces of the Little Tennessee and Tellico Rivers (Table 43).

Table 43. Distribution of bipolar reduction residue by landform.

Landform	Bipolar Flake n	Bipolar Flake $\bar{x}$	Bipolar Core n	Bipolar Core $\bar{x}$
T-1 Terrace (LTRV)	352	11.00	32	1.00
T-2 Terrace (LTRV)	95	9.50	13	1.30
>T-2 Terrace (LTRV)	430	15.93	19	.70
L. Tenn. Valley Slope	29	.88	11	.33
Tellico River Valley	304	17.88	43	2.53
Tellico Valley Slope	28	3.11	3	.33
Tributary Valley	62	2.14	13	.45
Tributary Valley Slope	111	3.83	19	.66
Lower Valley Uplands	11	.13	1	.01
Upper Valley Uplands	171	1.20	53	.37
Dissected Knobs	22	2.00	18	1.64
Total	1615		225	
Overall $\bar{X}$		3.80		.53

Note: $\bar{x}$ = mean artifact density (per sampling unit).

BLADE REDUCTION RESIDUE

Blade

Sample Size: 261.

Sampling Domain Distribution: 148 Alluvial Terraces, 6 Lower Valley Uplands, 56 Upper Valley Uplands, 51 Dissected Knobs.

Raw Material Distribution: 135 Knox Black Chert, 56 Knox Black Banded Chert, 34 Knox Dark Gray Chert, 11 Knox Light Gray Chert, 9 Knox Light Gray Banded Chert, 6 Chalcedony, 3 Knox Oolitic Chert, 3 Other Chert (Local), 2 Knox Mottled Chert, 1 Knox Porcellaneous Chert, 1 Quartz.

Description: A blade is defined as any flake whose length is at least twice its width, with parallel sides, and produced from a specially prepared core. Blades comprise a specific type of flake blank and are distinct from other kinds of flakes in terms of platform preparation and angle, bulb of percussion, and overall configuration. Unlike bipolar flakes, blades represent a highly economical method of flake production.

Blade Core (Figure 21m-q)

Sample Size: 22.

Sampling Domain Distribution: 13 Alluvial Terraces, 6 Upper Valley Uplands, 3 Dissected Knobs.

Raw Material Distribution: 11 Knox Black Banded Chert, 9 Knox Black Chert, 1 Knox Light Gray Banded Chert, 1 Chalcedony.

Description: A blade core is a specially prepared nucleus from which blades have been removed.

Distribution and Summary

Blade industries have been recognized for all periods of occupation within Tellico Reservoir. During the Early Archaic, blades and blade-like flakes were modified into side scrapers, unifacial knives, and possibly end scrapers (Chapman 1977:70). Similar tools have been recovered from Middle Woodland strata at Icehouse Bottom, in addition to prismatic blades of both local and exotic material (Chapman 1973:91-95; Cridlebaugh 1981:70-76). These latter tools were associated with Hopewellian interaction in the valley and may well have functioned in specialized cutting and scraping tasks. All blades recovered from the survey were made of local materials. Blades recovered from a Dallas cultural context at Tomotley suggest that their use during the Late Mississippian period was restricted largely to the production of ad hoc cutting and scraping implements (Kimball 1978:148-149).

A total of 283 blades and blade cores was recovered, comprising only 1.2% of unmodified debitage from the survey sample. Most were recovered from alluvial landforms of the Alluvial Terraces, Upper Valley Uplands, and Dissected Knobs sampling domains (Table 44).

MISCELLANEOUS REDUCTION RESIDUE

Shatter Fragment

Sample Size: 4,658.

Sampling Domain Distribution: 2,445 Alluvial Terraces, 89 Lower Valley Uplands, 1363 Upper Valley Uplands, 761 Dissected Knobs.

Raw Material Distribution: 950 Knox Black Chert, 893 Quartz, 822

Table 44. Distribution of blade reduction residue by landform.

Landform	Blade n	Blade $\bar{x}$	Blade Core n	Blade Core $\bar{x}$
T-1 Terrace (LTRV)	75	2.34	2	.06
T-2 Terrace (LTRV)	20	2.00	1	.10
>T-2 Terrace (LTRV)	44	1.63	8	.30
L. Tenn. Valley Slope	11	.33	1	.03
Tellico River Valley	54	3.18	5	.29
Tellico Valley Slope	4	.44	0	.00
Tributary Valley	14	.48	3	.07
Tributary Valley Slope	8	.28	0	.00
Lower Valley Uplands	2	.02	0	.00
Upper Valley Uplands	28	.20	2	.01
Dissected Knobs	1	.09	0	.00
Total	261		22	
Overall $\bar{X}$		.61		.05

Note: $\bar{x}$ = mean artifact density (per sampling unit).

Knox Black Banded Chert, 638 Knox Light Gray Banded Chert, 634 Knox Dark Gray Chert, 307 Knox Light Gray Chert, 119 Chalcedony, 79 Knox Porcellaneous Chert, 60 Quartzite, 50 Knox Dark Gray Banded Chert, 38 Knox Oolitic Chert, 30 Knox Mottled Chert, 19 Other Chert (Local), 10 Slate, 8 Other Chert (Non-local), 1 Shale.

Description: Shatter, as defined by Kimball (1982:146), consists of angular lithic debris produced during nodule reduction that cannot be identified as to specific reduction technique, due to a lack of distinguishing characteristics such as striking platform and bulb of percussion. Shatter fragments are probably associated with all reduction techniques discussed above and may be associated particularly with bipolar reduction since this technique results in a large proportion of irregular, unusable flakes.

Interior Flake

Sample Size: 414.

Sampling Domain Distribution: 263 Alluvial Terraces, 3 Lower Valley Uplands, 96 Upper Valley Uplands, 52 Dissected Knobs.

Raw Material Distribution: 162 Knox Black Chert, 60 Knox Dark Gray Chert, 58 Knox Black Banded Chert, 47 Knox Light Gray Chert, 37 Knox Light Gray Banded Chert, 17 Quartz, 14 Chalcedony, 6 Knox Porcellaneous Chert, 6 Other Chert (Local), 3 Knox Mottled Chert, 3 Knox Oolitic Chert, 1 Knox Dark Gray Banded Chert.

Description: Interior flakes are defined as flat flakes which represent an intermediate stage between primary reduction and bifacial thinning (Kimball 1985:85).

Chipped Stone (Indeterminate)

Sample Size: 2.

Sampling Domain Distribution: 2 Alluvial Terraces.

Raw Material Distribution: 1 Knox Black Chert, 1 Slate.

Description: This category includes debitage not conforming to any category described above. The slate specimen probably represents waste from the manufacture of a celt or gorget.

Ground Stone (Indeterminate)

Sample Size: 8.

Sampling Domain Distribution: 5 Alluvial Terraces, 2 Upper Valley Uplands, 1 Dissected Knobs.

Raw Material Distribution: 8 Slate.

Description: This category consists of unidentifiable lithic fragments that have been modified by grinding. These specimens may represent either pieces of broken, finished items such as celts and gorgets, or residue discarded during the manufacture of these items.

Distribution and Summary

Miscellaneous reduction residue comprised nearly 21% of all unmodified debitage (n=5,082). Whereas shatter fragments were well represented within all landform classes except the Lower Valley Uplands, all other debitage classes were restricted largely to the alluvial terraces of the Tellico and Little Tennessee rivers (Table 45).

Table 45. Distribution of miscellaneous reduction residue by landform.

Landform	Shatter Fragment n	Shatter Fragment $\bar{x}$	Interior Flake n	Interior Flake $\bar{x}$	Chipped Stone (Indeterminate) n	Chipped Stone (Indeterminate) $\bar{x}$	Ground Stone (Indeterminate) n	Ground Stone (Indeterminate) $\bar{x}$
T-1 Terrace (LTRV)	876	27.38	90	2.81	1	.03	2	.06
T-2 Terrace (LTRV)	274	27.40	61	6.10	0	.00	1	.10
>T-2 Terrace (LTRV)	1143	42.33	106	3.93	1	.04	1	.04
L. Tenn. Valley Slope	123	3.73	4	.12	0	.00	0	.00
Tellico River Valley	811	47.71	53	3.12	0	.00	2	.12
Tellico Valley Slope	45	5.00	3	.33	0	.00	0	.00
Tributary Valley	317	10.93	15	.52	0	.00	1	.03
Tributary Valley Slope	363	12.52	55	1.90	0	.00	0	.00
Lower Valley Uplands	63	.73	1	.01	0	.00	0	.00
Upper Valley Uplands	599	4.22	22	.15	0	.00	1	.01
Dissected Knobs	44	4.00	4	.36	0	.00	0	.00
Total	4658		414		2		8	
Overall $\bar{X}$		10.96		.97		<.01		.02

Note: $\bar{x}$ = mean artifact density (per sampling unit).

ACQUIRED RAW MATERIAL

Tested Nodule (Figure 21r)

Sample Size: 40.

Sampling Domain Distribution: 6 Alluvial Terraces, 24 Upper Valley Uplands, 10 Dissected Knobs.

Raw Material Distribution: 27 Knox Black Chert, 9 Knox Black Banded Chert, 2 Quartz, 1 Knox Dark Gray Chert, 1 Chalcedony.

Description: This category includes nodules of utilizable cryptocrystalline material that have been minimally modified by detaching one or a few flakes by direct percussion. The behavioral interpretation of these artifacts is that they represent potential cores that were tested to determine their suitability for lithic tool manufacture. All specimens are of locally available material.

Utilized Mineral (Figure 21s-t)

Sample Size: 34.

Sampling Domain Distribution: 22 Alluvial Terraces, 2 Lower Valley Uplands, 4 Upper Valley Uplands, 6 Dissected Knobs.

Raw Material Distribution: 24 Hematite, 4 Limonite, 2 Galena, 1 Mica, 1 Chlorite Schist, 1 Phyllite, 1 Quartz Crystal.

Description: Artifacts classified as utilized minerals can be divided into two categories: 1) locally derived, pigment-producing nodules that have been modified by rubbing or grinding; and 2) nonlocal minerals that have been imported and are either minimally modified or unmodified. Pigment-producing minerals include hematite, limonite, and galena, and are represented by heavily ground and

faceted specimens. Kimball (1981:32), in his study of Early Archaic activity structure at Rose Island, suggests that the use of hematite pigment may be associated with hide decoration. Other nonlocal lithic materials recovered during the survey--mica, chlorite schist, phyllite, and quartz crystal--probably represent residues from manufacturing ornamental items.

Distribution and Summary

Tested nodules and utilized minerals were differentially distributed within the survey sample, reflecting separate and largely unrelated systemic contexts and consequent archaeological contexts. Tested nodules, because they largely reflect failed attempts to identify usable raw material, were expected to occur archaeologically where they were found by the aboriginal flintknapper. Their predominant occurrence within the Upper Valley Uplands coincides with the presence of Knox Chert outcrops within this sampling domain. Utilized minerals, conversely, represent archaeological consequences of actual use and therefore were expected to occur at their place of use. These artifacts were distributed largely along alluvial terraces within the Alluvial Terraces domain, and along the Tellico River (Table 46).

HUNTING IMPLEMENTS

Projectile Point (Figures 23-26)

Sample Size: 431.

Sampling Domain Distribution: 252 Alluvial Terraces, 17 Lower Valley Uplands, 87 Upper Valley Uplands, 75 Dissected Knobs.

Raw Material Distribution: See Table 47.

Table 46. Distribution of acquired raw materials by landform.

Landform	Tested Nodule n	Tested Nodule $\bar{x}$	Utilized Mineral n	Utilized Mineral $\bar{x}$
T-1 Terrace (LTRV)	3	.09	9	.28
T-2 Terrace (LTRV)	0	.00	2	.20
>T-2 Terrace (LTRV)	3	.11	9	.33
L. Tenn. Valley Slope	2	.06	0	.00
Tellico River Valley	10	.59	8	.47
Tellico Valley Slope	0	.00	1	.11
Tributary Valley	4	.14	0	.00
Tributary Valley Slope	12	.41	1	.03
Lower Valley Uplands	0	.00	2	.02
Upper Valley Uplands	6	.04	2	.01
Dissected Knobs	0	.00	0	.00
Total	40		34	
Overall $\bar{X}$		.09		.08

Note: $\bar{x}$ = mean artifact density (per sampling unit).

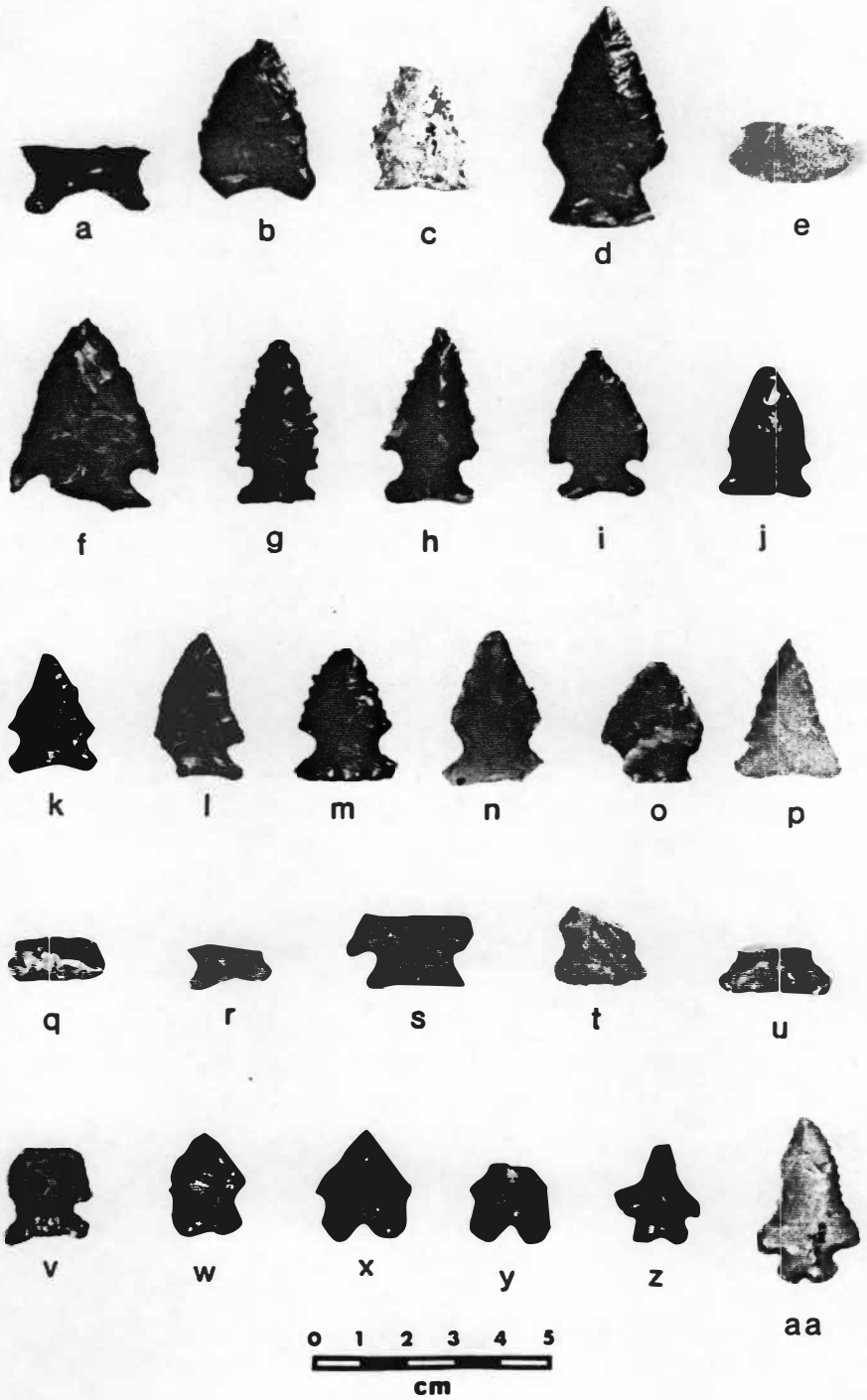


Figure 23. Early Archaic projectile points. Dalton (a-b); Decatur (c); Lower Kirk (d-e); Upper Kirk (f-v); St. Albans (w); LeCroy (x-y); and Kanawha (z-aa).

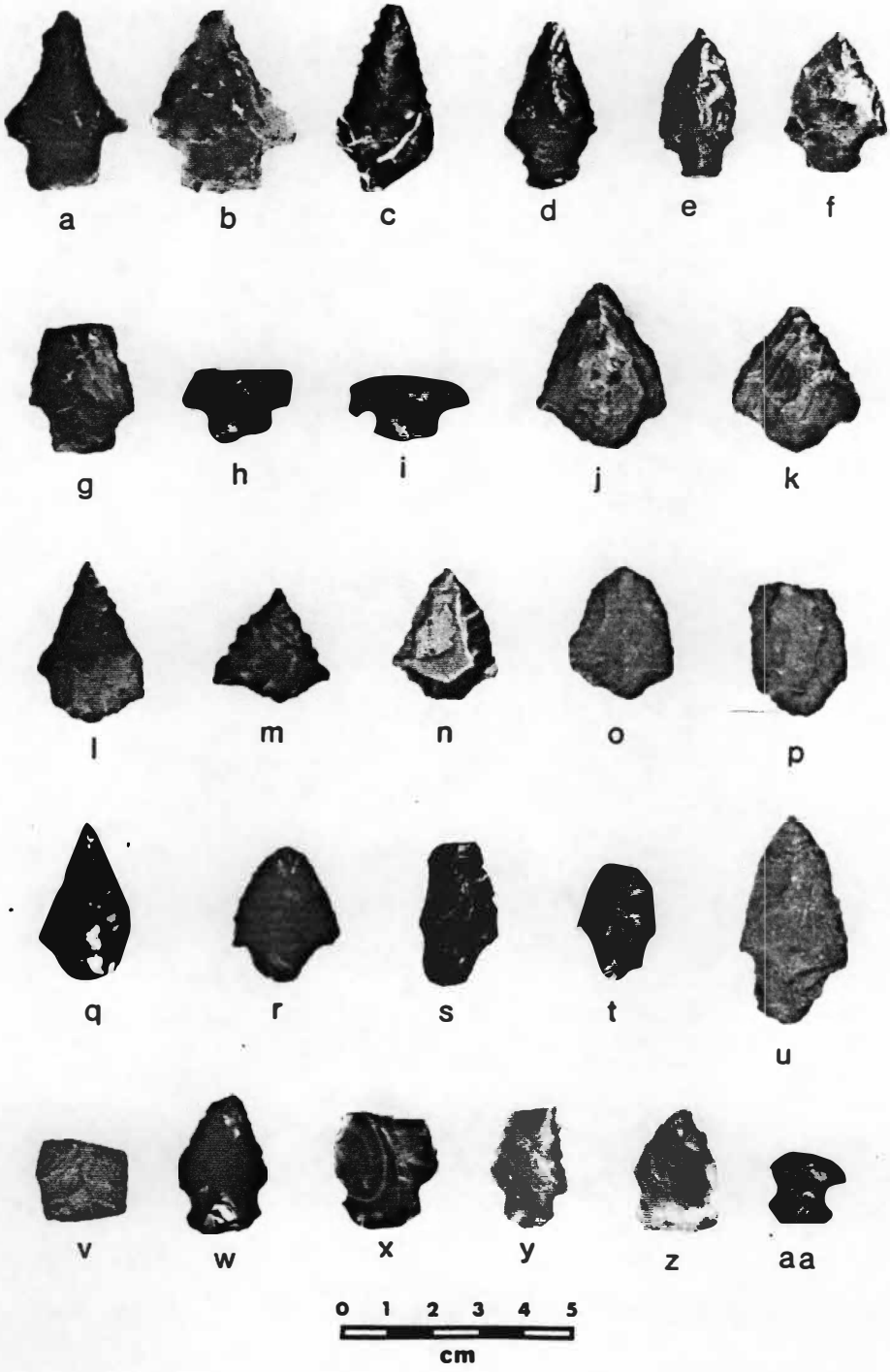


Figure 24. Middle Archaic projectile points. Kirk/Stanly (a-h); end scraper on Kirk/Stanly (i); Morrow Mtn. I (j-p); Morrow Mtn. II (q-u); Guilford (v); Sykes (w-z); and end scraper on Sykes (aa).

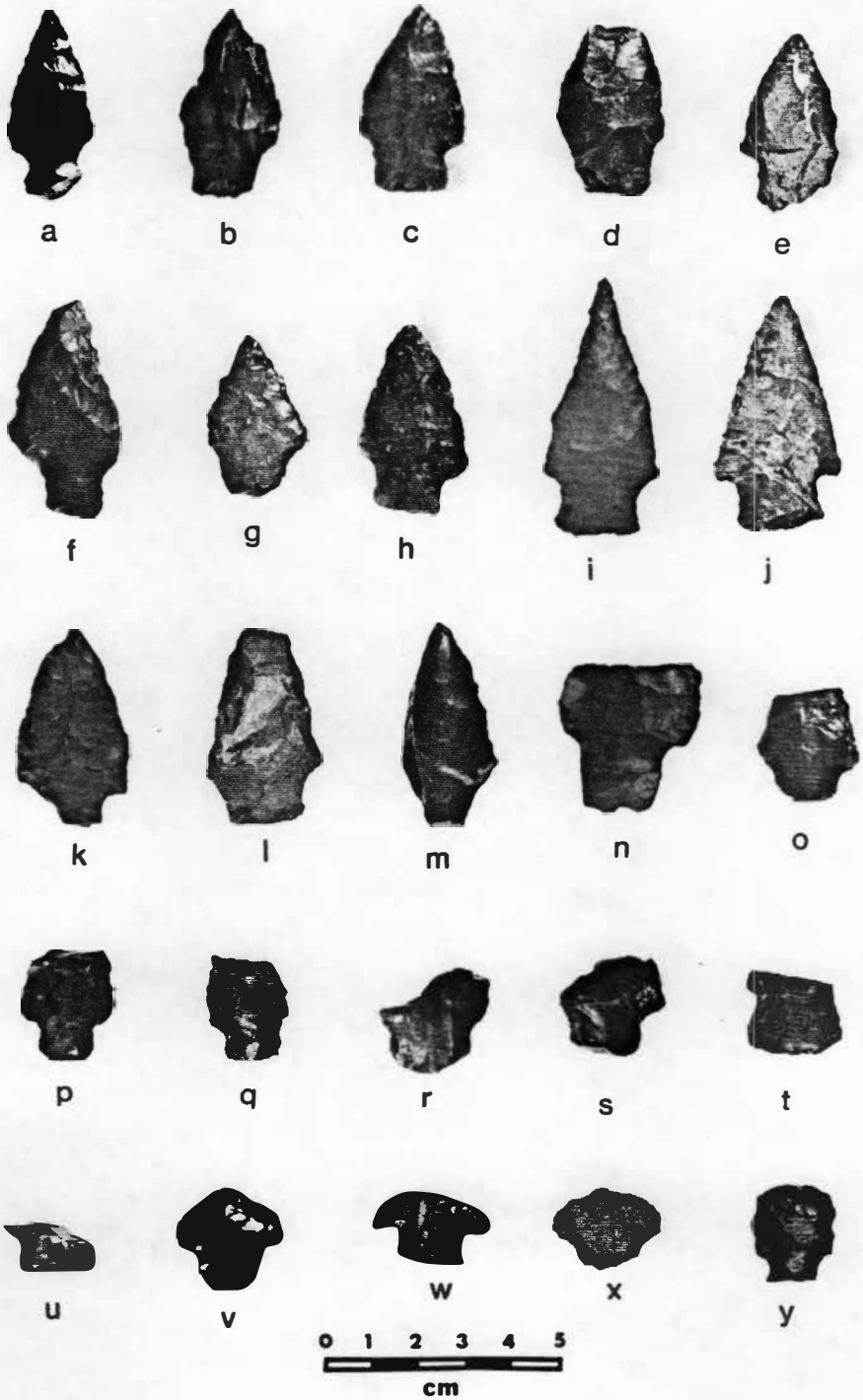


Figure 25. Late Archaic projectile points. Iddins (a-u) and end scraper on Iddins (v-y).

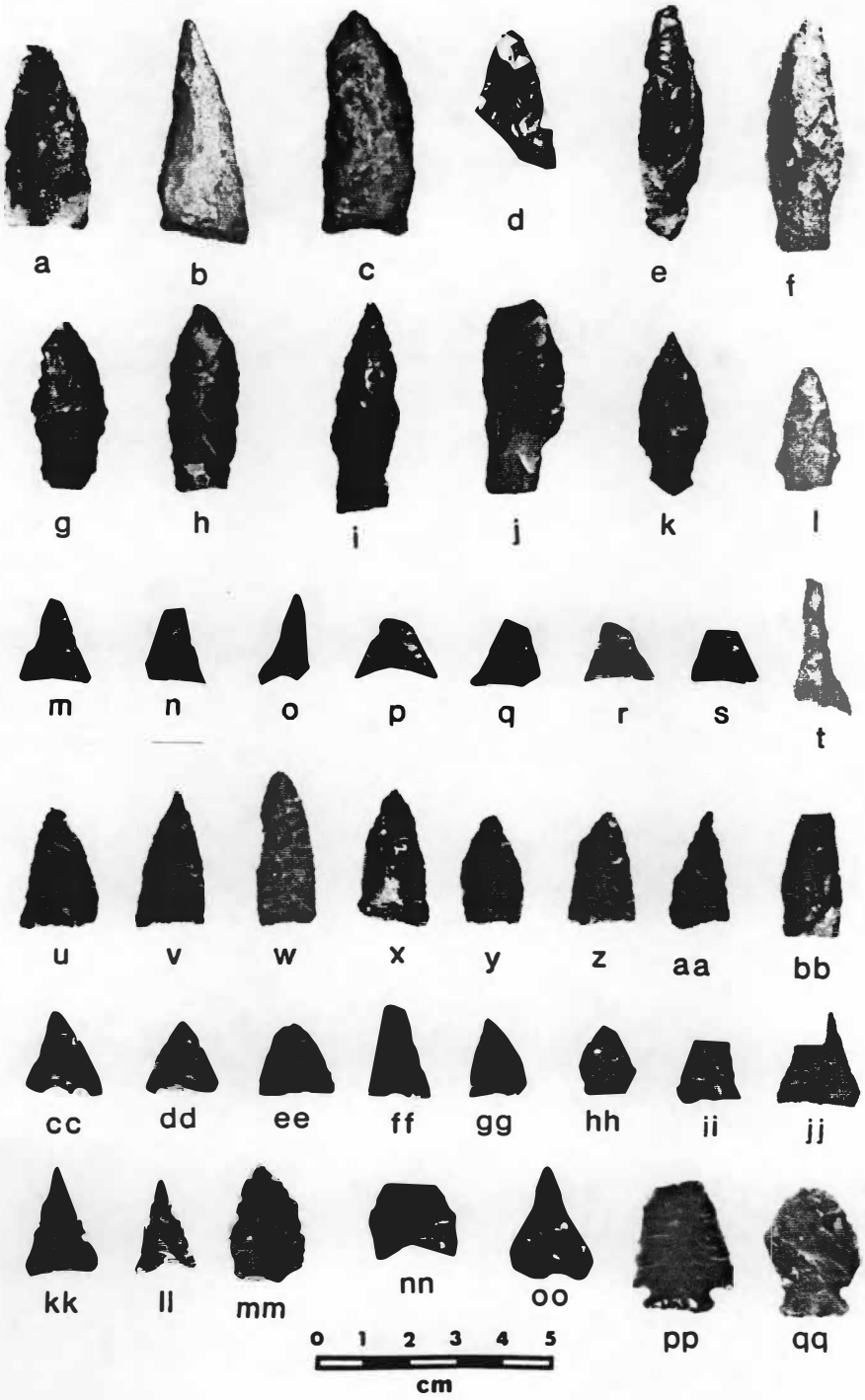


Figure 26. Woodland-Mississippian projectile points. Greeneville (a-b); Nolichucky (c); Connestee (d); Bradley Spike (e-k); drill on Bradley Spike (l); Hamilton (m-s); drill on Hamilton (t); Dallas (u-bb); Madison (cc-jj); Incurvate Base/Straight Blade (kk-ll); Pentagonal (mm-nn); perforator on Mississippian point (oo); and Corner Notched Triangular (pp-qq).

Table 47. Distribution of projectile points by raw material.

Projectile Point Type	Knox Formation Chert: Black	Knox Formation Chert: Black Banded	Knox Formation Chert: Lt. Gray Banded	Knox Formation Chert: Light Gray	Knox Formation Chert: Dark Gray	Chalcedony	Quartz	Other Chert (Local)	Other Chert (Non-local)	Total
ARCHAIC										
Dalton	2	1	-	-	-	-	-	-	-	3
Decatur	1	-	-	-	-	-	-	-	1	2
Lower Kirk	1	-	-	2	1	-	-	-	-	4
Upper Kirk	10	3	2	6	9	4	1	2	1	38
St. Albans	-	1	-	-	-	-	-	-	-	1
LeCroy	3	-	-	-	-	-	-	-	-	3
Kanawha	1	-	-	1	-	-	-	-	-	2
Kirk/Stanly	10	1	-	-	3	4	5	2	-	25
Morrow Mtn. I	1	4	-	1	-	2	6	-	1	15
Morrow Mtn. II	3	2	1	-	-	-	3	1	-	10
Guilford	-	1	-	-	-	-	-	1	-	2
Sykes	7	5	1	1	-	2	3	-	-	19
Savannah River	-	-	-	-	-	-	1	-	-	1
Iddins	11	6	-	1	8	-	6	3	9	44
Unident. Early Archaic	1	1	-	-	1	-	-	-	-	3
Unident. Middle Archaic	-	1	-	-	-	-	5	-	-	6
Unident. Late Archaic	-	-	-	-	-	-	1	1	-	2
Unident. Archaic	17	5	9	3	9	3	8	7	3	64
WOODLAND/MISSISSIPPIAN										
Greenville	-	-	-	-	1	1	-	-	-	2
Nolichucky	-	1	-	-	-	-	-	-	-	1
Connestee	1	-	-	-	1	1	-	-	-	3
Bradley Spike	2	3	1	-	3	-	-	-	-	9
Hamilton	5	4	-	1	1	-	-	-	-	11
Dallas	10	1	-	-	-	-	-	-	1	12
Madison	7	-	-	1	1	-	-	-	1	10
Str.Base/Inc.Blade	1	-	-	-	-	-	-	-	-	1
Inc.Base/Str.Blade	11	2	-	-	1	-	-	-	-	14
Pentagonal	-	2	-	2	1	-	-	-	-	5
Notched Triangular	1	-	-	-	1	-	-	1	-	3
Unident. Woodland	1	-	-	-	3	-	-	-	-	4
Unident. Mississippian	19	7	4	4	8	-	-	-	-	42
Unident. Proj. Pt.	26	8	4	6	8	-	15	2	1	70
Total	152	59	22	29	60	17	54	20	18	431

Description: This category includes all finished bifaces having lateral edges that converge to a point, and which have been modified at the proximal end to facilitate hafting. Projectile points occurring within the study area can be grouped into two broad morphological categories: stemmed and triangular. Stemmed points, with the exception of Bradley Spike, are restricted to the Archaic and possibly Early Woodland periods, and are thought to reflect a weapon system that employed an atlatl, or spear-thrower, and dart. Triangular points, conversely, are believed to be associated with the bow-and-arrow and occur archaeologically within Woodland and Mississippian contexts. Fourteen separate Archaic point types and 11 Woodland-Mississippian point types were identified within the survey sample (see Table 47). Their specific temporal associations are discussed further in Chapter V.

Atlatl Weight (Figure 27h)

Sample Size: 1.

Sampling Domain Distribution: 1 Dissected Knobs.

Raw Material Distribution: 1 Slate.

Description: This artifact is a fragment from a ground, barrel-shaped piece of slate with a hole drilled longitudinally and parallel to the long axis. Atlatl weights functioned as counterweights attached to spear-throwing sticks (Webb 1946). This style of atlatl weight has been found in association with Middle Archaic Morrow Mountain components at the Icehouse Bottom (Chapman 1977:90) and Howard (Chapman 1979:51) sites.

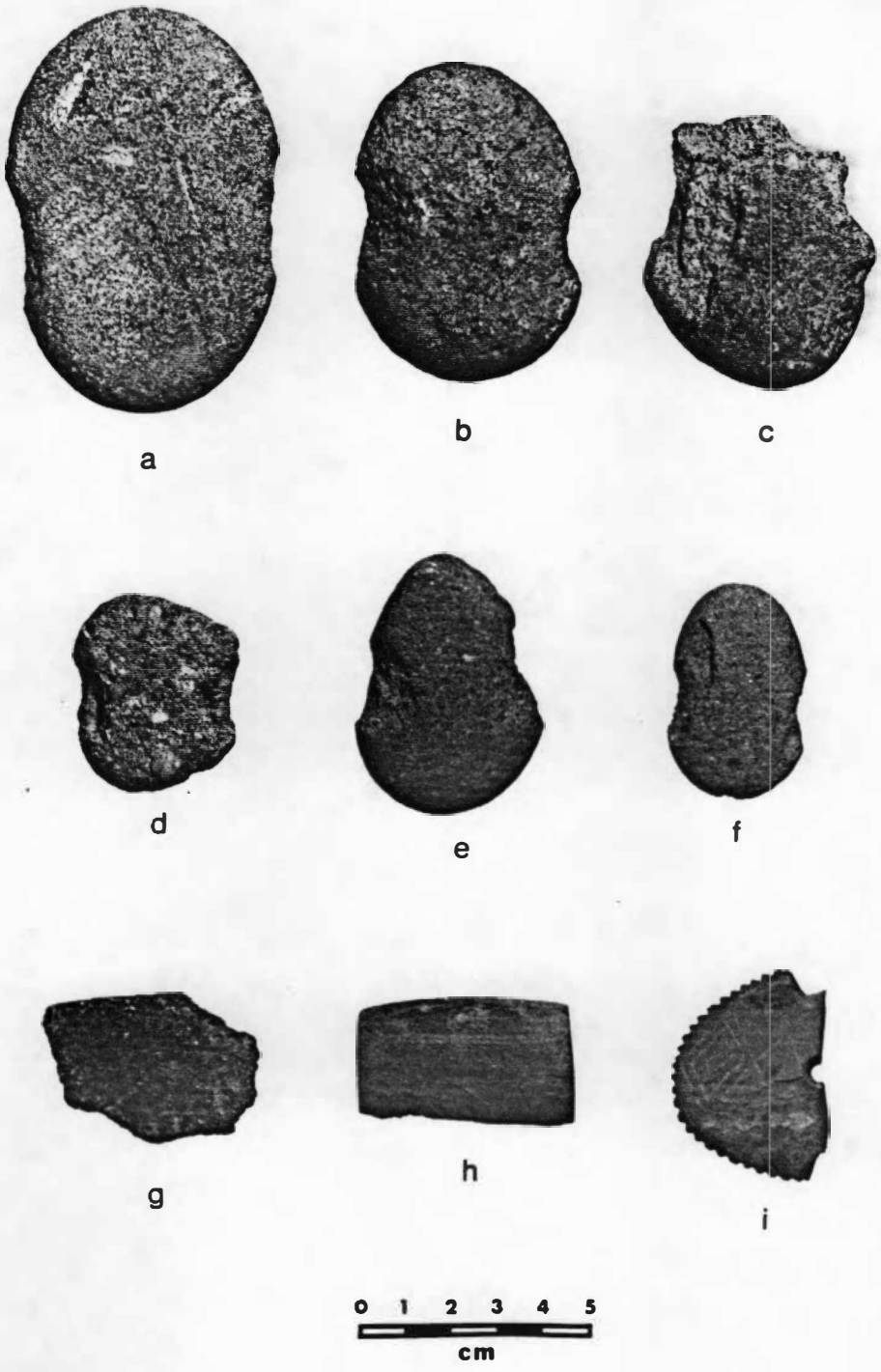


Figure 27. Miscellaneous chipped/ground stone artifacts. Netsinker (a-f); soapstone potsherd (g); atlatl weight fragment (h); and bar gorget fragment (i).

Distribution and Summary

Projectile points comprised the major class of formal tools recovered by the survey, and represented almost 82% of all artifacts interpreted as personal gear. Because of their ubiquity and patterned morphological variability over time, projectile points are particularly important in Southeastern archaeology as chronological indicators.

As hafted tools, projectile points were anticipated largely within archaeological contexts associated with maintenance activities. Those artifacts that entered the archaeological record as a consequence of re-hafting during a "gearing up" episode (Binford 1979) were expected to consist primarily of either broken or exhausted tools. In fact, diagnostic attributes of tool exhaustion, such as diminutive size and pronounced edge asymmetry, were well represented among projectile point samples recovered from Archaic and Woodland base camp sites excavated within Tellico Reservoir (see Chapman 1977, 1981; Cridlebaugh 1981). Since tool re-hafting often requires the use of fire for applying adhesives, this activity probably occurred primarily at either residential sites or temporary hunting camps. Within "off-site" contexts (i.e., those locations away from the camp or village and where the tools were actually used), projectile points should occur in significantly fewer numbers and include a proportionately greater number of unbroken, unexhausted specimens. This latter expectation is based upon the idea that tool discard or loss during hunting is a more random process than intentional re-hafting and tool replacement.

In order to test this expectation against the survey sample and to explore possible temporal differences, all identified projectile points were initially divided into two groups--Archaic and Woodland-Mississippian--and then sub-divided based upon condition (i.e., complete or basal fragment). These data are presented in Table 48. For both time periods, a majority of the points in the sample were recovered from valley landforms and were complete rather than broken. By dichotomizing landforms as "valley" or "upland" and calculating the ratio of complete-to-broken specimens based on mean frequencies, a strong argument can be made for significant difference in land use for both Archaic and Woodland-Mississippian occupations. Among valley landforms, the ratio of complete-to-broken points was 2.68 whereas among upland landforms it increased to 11.36. This pattern was repeated for the Woodland-Mississippian points where the "valley" ratio was 7.67 and the "upland" ratio was 19.00. These latter ratios are somewhat higher than those for the Archaic period and may reflect differences related to the use of an atlatl versus a bow-and-arrow (and consequent differences in the rate of point breakage). In both cases, however, a substantially higher ratio of complete-to-broken specimens was observed on upland landforms. This is wholly consistent with the conclusion (suggested in discussing the distributions of other artifact categories) that upland land use was comprised primarily of resource extraction activities. Most projectile point fragments, representing broken tools that would have been discarded during re-hafting, occured predominantly on valley landforms. This pattern is also consistent with distributions of other artifact

Table 48. Distribution of projectile points by condition and landform.

Landform	Archaic				Woodland-Mississippian			
	Complete		Basal Frag.		Complete		Basal Frag.	
	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
T-1 Terrace (LTRV)	15	.47	8	.25	36	1.13	5	.16
T-2 Terrace (LTRV)	16	1.60	5	.50	18	1.80	3	.30
>T-2 Terrace (LTRV)	51	1.89	19	.70	19	.70	4	.15
L. Tenn. Valley Slope	10	.30	1	.03	0	.00	0	.00
Tellico River Valley	32	1.88	12	.71	15	.88	0	.00
Tellico Valley Slope	1	.11	0	.00	0	.00	0	.00
Tributary Valley	6	.21	3	.10	5	.17	0	.00
Tributary Valley Slope	9	.31	2	.07	4	.14	0	.00
Lower Valley Uplands	6	.07	0	.00	1	.01	0	.00
Upper Valley Uplands	36	.25	6	.04	6	.04	1	.01
Dissected Knobs	6	.55	0	.00	0	.00	0	.00
Total	188		56		104		13	
Overall $\bar{X}$		.44		.13		.24		.03

Note: $\bar{x}$ = mean artifact density (per sampling unit).

categories that are considered to reflect residential site contexts.

In addition to using tool condition as a means for drawing inferences about discard behavior, the distribution of projectile points was also used to obtain temporally specific information about site distributions. This was accomplished by plotting the mean artifact density by major time period and landform (Figure 28). Projectile point frequencies are presented in Table 49. By viewing the data in this manner, six distributional patterns were delineated.

Pattern 1. Projectile points that date to the Archaic period were poorly represented on the first alluvial terrace of the Little Tennessee River and generally occurred in inverse proportion to their antiquity. This is a direct reflection of the fact that most of the Archaic and some of the Woodland archaeological record lay deeply buried along this terrace throughout much of the study area. Because the survey sample was based upon surface collections, Archaic and Early Woodland cultural phases were under-represented on this landform.

Pattern 2. Projectile points of all time periods occurred in relatively low frequency along tributary valleys, tributary valley slopes, and uplands compared to alluvial valley landforms. This was seen not only as an indication of less intensive activity within the uplands, but also as a reflection of activities that were different in kind. Clearly, activities that resulted in a high discard rate for hafted bifaces were consistently uncommon within the uplands throughout prehistory. Given that high projectile point density is at least an indirect reflection of maintenance behavior, the point

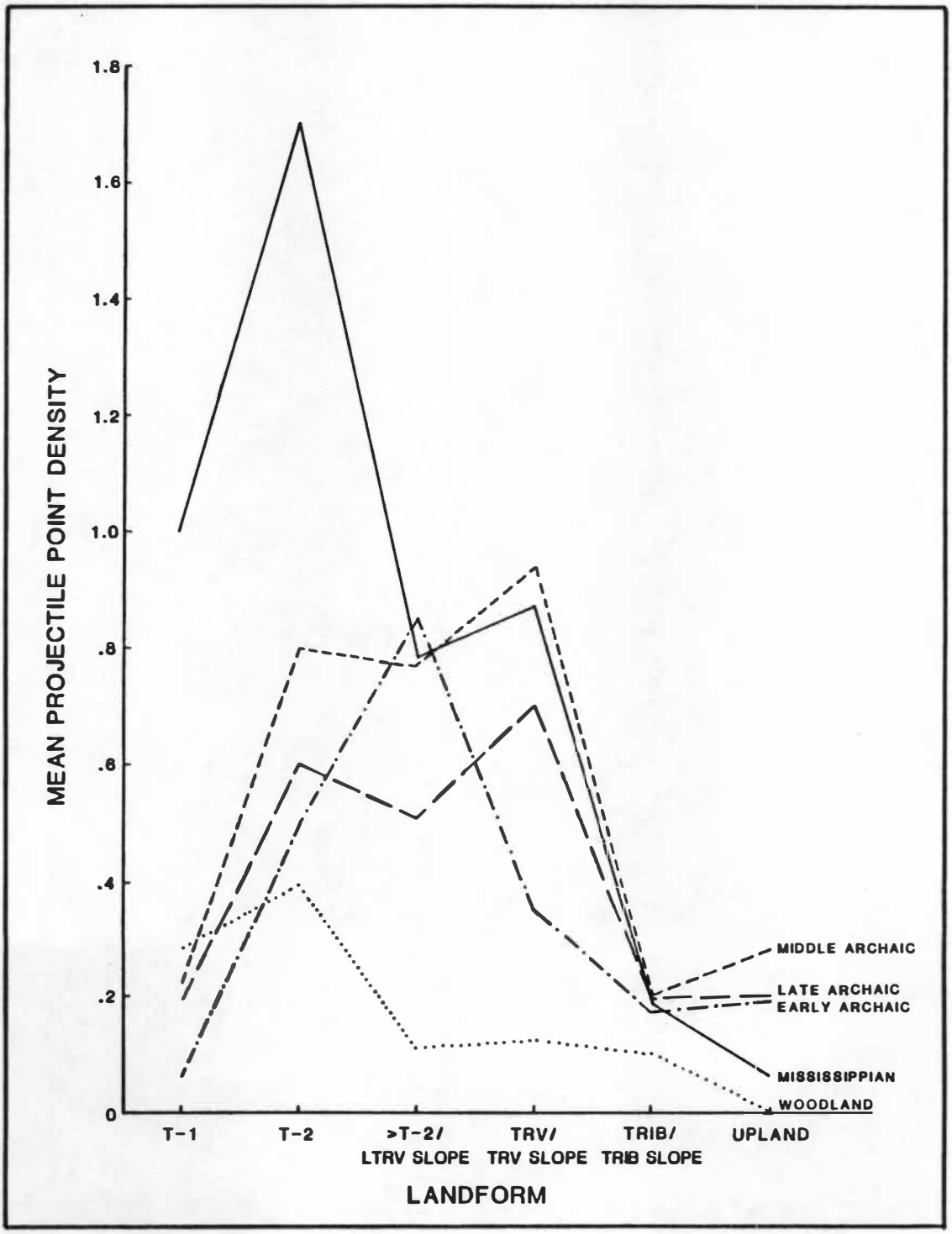


Figure 28. Frequency distribution of projectile points by landform and time period.

Table 49. Distribution of projectile points by time period and landform.

Landform	Early Archaic n	Early Archaic $\bar{x}$	Middle Archaic n	Middle Archaic $\bar{x}$	Late Archaic n	Late Archaic $\bar{x}$	Woodland n	Woodland $\bar{x}$	Mississippian n	Mississippian $\bar{x}$
T-1 Terrace (LTRV)	2	.06	7	.22	6	.19	9	.28	32	1.00
T-2 Terrace (LTRV)	5	.50	8	.80	6	.60	4	.40	17	1.70
>T-2 Terrace (LTRV)	23	.85	15	.56	13	.48	3	.11	20	.74
L. Tenn. Valley Slope	0	.00	7	.21	1	.03	0	.00	1	.03
Tellico River Valley	6	.35	16	.94	10	.59	2	.12	13	.76
Tellico Valley Slope	0	.00	0	.00	1	.11	0	.00	1	.11
Tributary Valley	4	.14	2	.07	1	.03	2	.07	3	.10
Tributary Valley Slope	1	.03	3	.10	4	.14	1	.03	3	.10
Lower Valley Uplands	1	.01	3	.03	1	.01	0	.00	1	.01
Upper Valley Uplands	13	.09	10	.07	2	.01	0	.00	7	.05
Dissected Knobs	1	.09	2	.18	2	.18	0	.00	0	.00
Total	56		73		47		21		98	
Overall $\bar{x}$		.13		.17		.11		.05		.23

Note: $\bar{x}$ = mean artifact density (per sampling unit).

distribution suggests that such behavior (indicative of residential site use) was limited largely to the alluvial terraces of the Little Tennessee and Tellico rivers.

Pattern 3. Projectile points assigned to the Early Archaic period were recovered predominantly from the older terraces of the Little Tennessee River, suggesting that these landforms may have been preferred locations for camp sites.

Pattern 4. Middle and Late Archaic projectile points were similarly distributed and occurred in relatively high and equal frequency along T-2 and >T-2 terraces, and along Tellico river. Since all Archaic periods were underrepresented on the first terrace, this distribution may indicate a more generalized pattern of camp location than was observed for the Early Archaic period.

Pattern 5. The distribution of Woodland projectile points suggests that most residential sites were located on the first and second terraces of the Little Tennessee River.

Pattern 6. Mississippian points, while occurring in high frequency on all alluvial landforms, were predominant along the second terrace of the Little Tennessee River. As will be seen in the Chapter VII, this reflects a generalized Mississippian residence pattern within the study area where larger villages were located along the second terrace and smaller settlements were distributed throughout the valley.

A general summary of the distribution of hunting implements by landform is provided in Table 50.

Table 50. Distribution of hunting implements by landform.

Landform	Archaic Projectile Point n	Archaic Projectile Point $\bar{x}$	Woodland-Mississippian Projectile Point n	Woodland-Mississippian Projectile Point $\bar{x}$	Unidentified Projectile Point n	Unidentified Projectile Point $\bar{x}$	Atlatl Weight n	Atlatl Weight $\bar{x}$
T-1 Terrace (LTRV)	23	.72	41	1.28	16	.50	0	.00
T-2 Terrace (LTRV)	21	2.10	21	2.10	11	1.10	0	.00
>T-2 Terrace (LTRV)	70	2.59	23	.85	12	.44	0	.00
L. Tenn. Valley Slope	11	.33	0	.00	2	.06	0	.00
Tellico River Valley	44	2.59	15	.88	19	1.12	1	.06
Tellico Valley Slope	1	.11	0	.00	1	.11	0	.00
Tributary Valley	9	.31	5	.17	1	.03	0	.00
Tributary Valley Slope	11	.38	4	.14	3	.10	0	.00
Lower Valley Uplands	6	.07	1	.01	0	.00	0	.00
Upper Valley Uplands	42	.30	7	.05	5	.04	0	.00
Dissected Knobs	6	.55	0	.00	0	.00	0	.00
Total	244		117		70		1	
Overall $\bar{x}$		.57		.28		.16		<.01

Note: $\bar{x}$ = mean artifact density (per sampling unit).

CUTTING IMPLEMENTS

Knife (Figure 29a)

Sample Size: 6.

Sampling Domain Distribution: 5 Alluvial Terraces, 1 Upper Valley Uplands.

Raw Material Distribution: 2 Knox Light Gray Banded Chert, 2 Quartz, 1 Knox Black Chert, 1 Knox Mottled Chert.

Description: A knife is defined as an elongate, bifacially worked flake blank that exhibits regular and continuous retouch along one or both lateral edges. The paucity of bifacial knives in the sample was due to the likelihood that hafted projectile points probably served a similar function throughout most of the cultural sequence.

Side Scraper (Figure 29b-j)

Sample Size: 17.

Sampling Domain Distribution: 10 Alluvial Terraces, 5 Upper Valley Uplands, 2 Dissected Knobs.

Raw Material Distribution: 5 Knox Black Chert, 3 Knox Black Banded Chert, 3 Knox Light Gray Banded Chert, 2 Other Chert (Non-local), 1 Knox Light Gray Chert, 1 Knox Dark Gray Chert, 1 Quartz, 1 Quartzite.

Description: A side scraper is defined as an elongate flake with steep, continuous retouch along one or both lateral edges. Retouch is usually unifacial. Although the generally steep edge angles found on this class of tools suggest possible use in scraping tasks, it is likely that some of these specimens represent flake knives.

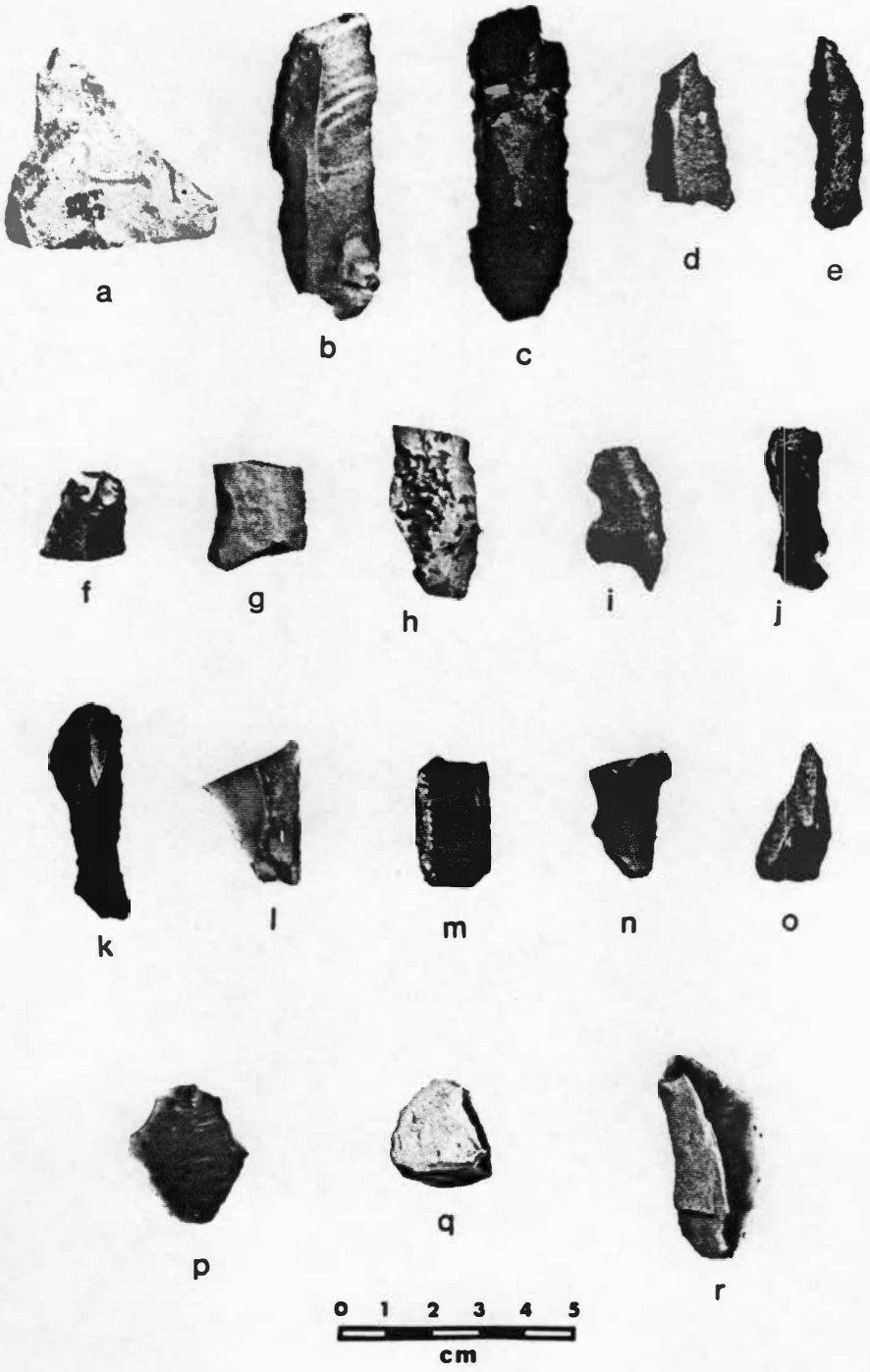


Figure 29. Cutting implements. Bifacial knife (a); side scraper (b-j); retouched flake (k-q); and utilized flake (r).

Retouched Flake (Figure 29k-o)

Sample Size: 167.

Sampling Domain Distribution: 97 Alluvial Terraces, 4 Lower Valley Uplands, 41 Upper Valley Uplands, 25 Dissected Knobs.

Raw Material Distribution: 82 Knox Black Chert, 42 Knox Black Banded Chert, 13 Knox Dark Gray Chert, 7 Quartz, 6 Knox Light Gray Banded Chert, 4 Knox Light Gray Chert, 4 Knox Porcellaneous Chert, 4 Quartzite, 3 Chalcedony, 1 Knox Oolitic Chert, 1 Other Chert (Local).

Description: This category includes any flake exhibiting "fine retouch or simply edge modification resulting from use that departs the face of the implement at least 2 mm from the edge" (Kimball 1982:142). Retouched flakes represent ad hoc cutting tools (or situational gear - Binford 1979:264-266) that were used with little intentional edge working.

Utilized Flake (Figure 29p-r)

Sample Size: 1,373.

Sampling Domain Distribution: 903 Alluvial Terraces, 17 Lower Valley Uplands, 291 Upper Valley Uplands, 162 Dissected Knobs.

Raw Material Distribution: 778 Knox Black Chert, 296 Knox Black Banded Chert, 129 Knox Dark Gray Chert, 68 Knox Light Gray Chert, 38 Knox Light Gray Banded Chert, 21 Chalcedony, 10 Quartz, 10 Other Chert (Non-local), 7 Knox Porcellaneous Chert, 5 Knox Mottled Chert, 5 Quartzite, 4 Other Chert (Local), 1 Knox Dark Gray Banded Chert, 1 Knox Oolitic Chert.

Description: This category includes any flake exhibiting flake removal scars less than 2 mm in length along the lateral edges.

Scarring is assumed to be a consequence of use rather than intentional edge modification. Utilized flakes represent ad hoc cutting implements.

Distribution and Summary

Cutting implements recognized in the survey sample included both formalized tools such as bifacial knives and side scrapers, and ad hoc tools (e.g., retouched and utilized flakes) that were used with minimal or no intentional edge modification. These tools probably were employed in a variety of tasks, including butchering, food preparation, hide working, bone working, wood working, and the manufacture of utilitarian items from vegetal materials. Whereas bifacial knives and some side scrapers represent curated tools that would have entered the archaeological record upon edge exhaustion and replacement, ad hoc tools (as situational gear) were expected to occur at or near their place of use.

Cutting implements were by far the most frequent class of lithic tools recovered, and comprised almost 65% of the tool sample. Formalized cutting tools occurred largely within the Alluvial Terraces domain (65.2% of sample). Simple flake implements were likewise distributed with approximately 61% occurring within this domain. In addition to alluvial terrace landforms, simple flake implements also were frequently recovered along tributary valleys and valley slopes within the study area (Table 51).

Table 51. Distribution of cutting implements by landform.

Landform	Bifacial Knife n	Bifacial Knife $\bar{x}$	Side Scraper n	Side Scraper $\bar{x}$	Retouched Flake n	Retouched Flake $\bar{x}$	Utilized Flake n	Utilized Flake $\bar{x}$
T-1 Terrace (LTRV)	0	.00	4	.13	32	1.00	343	10.72
T-2 Terrace (LTRV)	0	.00	1	.10	22	2.20	318	31.80
>T-2 Terrace (LTRV)	5	.19	4	.15	38	1.41	220	8.15
L. Tenn. Valley Slope	0	.00	0	.00	2	.06	18	.54
Tellico River Valley	0	.00	2	.12	29	1.71	163	9.59
Tellico Valley Slope	0	.00	0	.00	1	.11	15	1.67
Tributary Valley	0	.00	2	.07	13	.45	54	1.86
Tributary Valley Slope	0	.00	2	.07	17	.59	128	4.41
Lower Valley Uplands	0	.00	0	.00	3	.03	7	.08
Upper Valley Uplands	1	.01	2	.01	10	.07	104	.73
Dissected Knobs	0	.00	0	.00	0	.00	3	.27
Total	6		17		167		1373	
Overall $\bar{\bar{x}}$		.01		.04		.39		3.23

Note: $\bar{x}$ = mean artifact density (per sampling unit).

HEAVY BUTCHERING IMPLEMENTS

Chopper (Figure 30a-c)

Sample Size: 18.

Sampling Domain Distribution: 15 Alluvial Terraces, 1 Lower Valley Uplands, 2 Upper Valley Uplands.

Raw Material Distribution: 12 Quartzite, 2 Quartz, 2 Conglomerate, 1 Limestone.

Description: Choppers consist of cobbles and cobble spalls that are bifacially worked at one end to produce an angular cutting edge. Due to their large size, these implements probably were used for specialized chopping tasks rather than for simple cutting. Although it is assumed that most choppers were used during butchering as cleavers and to extract bone marrow (see Binford 1979:264-265), their possible role in processing vegetal materials must also be considered.

Chopper/Scraper (Figure 30d-e)

Sample Size: 14.

Sampling Domain Distribution: 14 Alluvial Terraces.

Raw Material Distribution: 7 Quartzite, 3 Slate, 1 Quartz, 1 Shale, 1 Limestone, 1 Metaquartzite.

Description: This category includes cobbles and cobble spalls that have been unifacially or bifacially retouched along the lateral margins. Chopper/scrapers are similar to the Kaotah, an implement used by Nunamiut Eskimo "as long tabular hammers and as rather massive 'scrapers' for removing the periosteum along long bone shafts before breaking them" (Binford 1979:264, Figure 1).

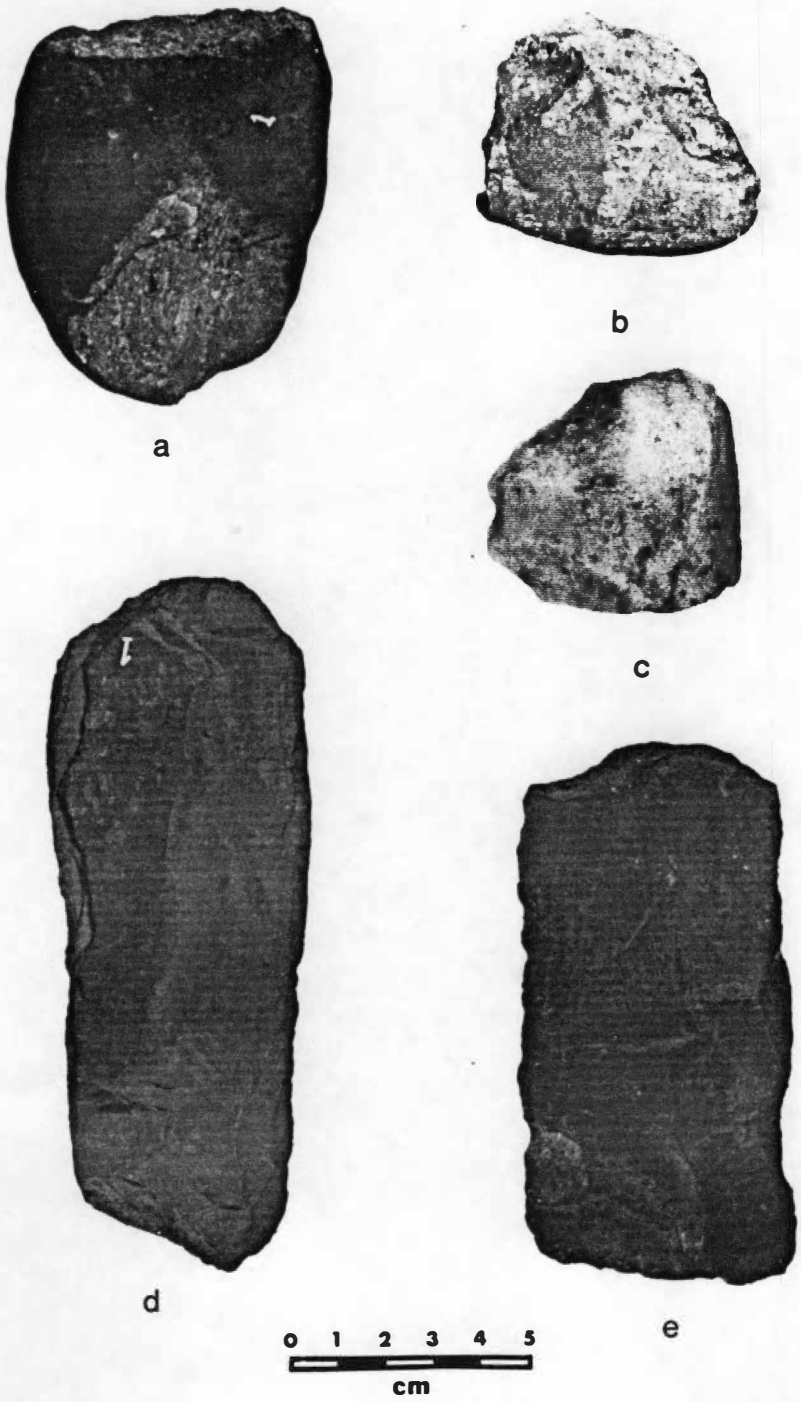


Figure 30. Heavy butchering implements. Chopper (a-c) and chopper/scraper (d-e).

Distribution and Summary

Binford (1979:264), based on his observations about Nunamiut curated technologies, has suggested that large chopping tools used in butchering may exist in the systemic context as site furniture that would be cached at a residential camp or hunting camp when not in use. Choppers and chopper/scrapers comprised approximately 1.3% of the stone tools recovered during survey and just over 16% of all tools classified as site furniture. Almost all large chopping tools were recovered from the Alluvial Terraces domain and all were made of locally available lithic material (Table 52).

HIDE WORKING IMPLEMENTS

End Scraper (Figure 31a-f)

Sample Size: 36.

Sampling Domain Distribution: 20 Alluvial Terraces, 8 Upper Valley Uplands, 8 Dissected Knobs.

Raw Material Distribution: 11 Knox Black Chert, 9 Knox Black Banded Chert, 6 Knox Dark Gray Chert, 3 Knox Light Gray Banded Chert, 2 Knox Light Gray Chert, 2 Quartz, 2 Other Chert (Non-local), 1 Knox Oolitic Chert.

Description: An end scraper is defined as an elongate flake (often a thick blade) that has been unifacially retouched at the distal end to produce a straight-to-convex, uniform, steep-angled working edge. Lateral edges also are often unifacially retouched to produce an overall triangular form. These tools probably were hafted in either a bone, antler, or dense wood handle to facilitate their use

Table 52. Distribution of heavy butchering and hide-working implements by landform.

Landform	Heavy Butchering				Hide Working			
	Chopper		Chopper/Scraper		End Scraper		Perforator	
	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
T-1 Terrace (LTRV)	6	.19	9	.28	7	.22	2	.06
T-2 Terrace (LTRV)	4	.40	0	.00	6	.60	2	.20
>T-2 Terrace (LTRV)	5	.19	4	.15	7	.26	2	.07
L. Tenn. Valley Slope	0	.00	0	.00	0	.00	0	.00
Tellico River Valley	10	.00	1	.06	6	.35	4	.24
Tellico Valley Slope	0	.00	0	.00	1	.11	0	.00
Tributary Valley	2	.07	0	.00	0	.00	1	.03
Tributary Valley Slope	10	.00	0	.00	4	.14	0	.00
Lower Valley Uplands	0	.00	0	.00	0	.00	0	.00
Upper Valley Uplands	1	.01	0	.00	4	.03	2	.01
Dissected Knobs	0	.00	0	.00	1	.09	0	.00
Total	18		14		36		13	
Overall $\bar{X}$		.05		.03		.08		.03

Note: $\bar{x}$ = mean artifact density (per sampling unit).

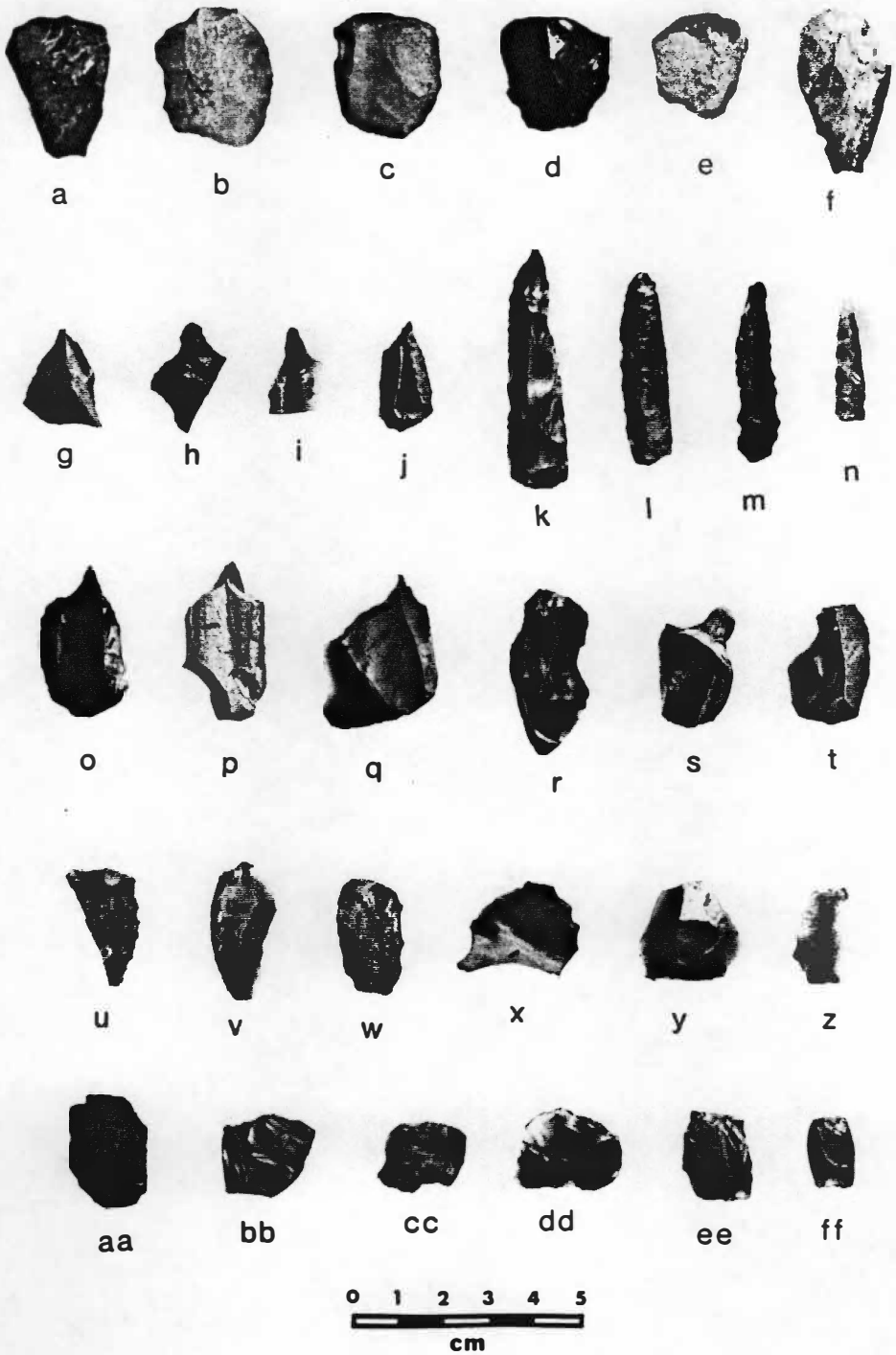


Figure 31. Miscellaneous stone tools. End scraper (a-f); perforator (g-j); drill (k-n); graver (o-q); spokeshave (r-t); denticulate (u-z); and pièce esquillée (aa-ff).

in scraping and dressing hides. The interpretation of such artifacts as hide scrapers is supported by micro-wear analyses on ethnographic specimens by Hayden (1979).

Eleven projectile points also were recovered which had been recycled into end scrapers. These artifacts are discussed above with projectile points.

Perforator (Figure 31g-j)

Sample Size: 13.

Sampling Domain Distribution: 6 Alluvial Terraces, 3 Upper Valley Uplands, 4 Dissected Knobs.

Raw Material Distribution: 8 Knox Black Chert, 2 Knox Black Banded Chert, 2 Knox Mottled Chert, 1 Quartz.

Description: A perforator is a flake tool that has been finely retouched to produce a pointed tool bit. Morphological characteristics of perforators suggest that they were used to cut or punch holes. The general lack of edge damage observed on most specimens indicates that they probably were used on a soft material such as skins or hides.

Distribution and Summary

End scrapers and perforators are the only tool categories that can be largely associated with hide-working activities. Other tools such as bifacial knives, side scrapers, utilized flakes, and retouched flakes probably were also used in hide working and manufacturing clothing. Other perishable tools not recovered by survey but expected within aboriginal hide-working toolkits include bone awls, needles,

and beamers. Examples of these artifacts were recovered from excavated contexts at several sites within the valley that contained well-preserved faunal remains (e.g., Guthe and Bistline 1978:200; Schroedl 1975:245-247, 1978b:147; Schroedl et al. 1985).

End scrapers and perforators comprised two percent of all lithic tools recovered and were collected from all sampling domains except the Lower Valley Uplands. End scrapers were the second-most frequent class of artifacts representing personal gear and comprised 6.9% of those artifacts. Hide-working implements were associated largely with the alluvial valleys of the Little Tennessee and Tellico rivers (Table 52).

NON-LITHIC TOOL MANUFACTURING IMPLEMENTS

Drill (Figure 31k-n)

Sample Size: 14.

Sampling Domain Distribution: 9 Alluvial Terraces, 1 Lower Valley Uplands, 3 Upper Valley Uplands, 1 Dissected Knobs.

Raw Material Distribution: 9 Knox Black Chert, 3 Knox Black Banded Chert, 1 Knox Light Gray Chert, 1 Knox Dark Gray Chert.

Description: A drill is a bifacial tool that has a long, parallel-sided, rod-like projection produced by bifacial retouch. The projection or tool bit is usually bi-convex or diamond-shaped in cross-section. Tool morphology, and the frequent occurrence of edge damage and polish along the bit edges, suggest that these implements were hafted and used to drill dense materials such as wood, antler, and possibly soft stone. In addition to these tools, three projectile

points were collected that had been reworked into drills. These artifacts are discussed above with hunting implements.

Spokeshave (Figure 31r-t)

Sample Size: 13.

Sampling Domain Distribution: 9 Alluvial Terraces, 2 Upper Valley Uplands, 2 Dissected Knobs.

Raw Material Distribution: 7 Knox Black Chert, 3 Knox Black Banded Chert, 1 Knox Light Gray Chert, 1 Other Chert (Non-local), 1 Quartzite.

Description: A spokeshave is defined as any flake or biface that has been unifacially retouched to produce a regular, concave working edge. Tool morphology indicates a plane-like use, probably for shaving wooden implements and weapons during manufacture.

Denticulate (Figure 31u-z)

Sample Size: 15.

Sampling Domain Distribution: 10 Alluvial Terraces, 1 Lower Valley Uplands, 3 Upper Valley Uplands, 1 Dissected Knobs.

Raw Material Distribution: 8 Knox Black Chert, 4 Knox Black Banded Chert, 2 Knox Light Gray Chert, 1 Knox Dark Gray Chert.

Description: A denticulate is a flake tool that has isolated, retouched projections along its margins, producing a serrated working edge. These cutting tools probably were used to saw or shred wood or other vegetal materials.

Pièce Esquillée (Figure 31aa-ff)

Sample Size: 90.

Sampling Domain Distribution: 58 Alluvial Terraces, 2 Lower Valley Uplands, 21 Upper Valley Uplands, 9 Dissected Knobs.

Raw Material Distribution: 42 Knox Black Chert, 21 Knox Black Banded Chert, 13 Knox Dark Gray Chert, 3 Knox Light Gray Banded Chert, 3 Knox Light Gray Chert, 3 Chalcedony, 2 Knox Mottled Chert, 2 Quartz, 1 Knox Dark Gray Banded Chert.

Description: Pièces esquillées are flakes, bifaces, or exhausted cores that exhibit one or more sharp, straight, crushed working edges, produced by repeated blows using a bipolar percussion technique. A majority of the specimens recovered by probabilistic survey and described from excavated sites in Tellico Reservoir displayed regularized crushing or battering along opposing edges, which indicate that the edges were deliberately modified and not simply the by-product of bipolar reduction or use (Chapman 1975:143-144). Pièces esquillées, based on observations by MacDonald (1968:85-90) and Keeley (1980: 40-41, 47), are interpreted as wedging or slotting tools for working bone or wood.

Graver (Figure 31o-q)

Sample Size: 16.

Sampling Domain Distribution: 6 Alluvial Terraces, 9 Upper Valley Uplands, 1 Dissected Knobs.

Raw Material Distribution: 9 Knox Black Chert, 6 Knox Black Banded Chert, 1 Knox Mottled Chert.

Description: A graver is defined as any flake or biface that

possesses fine retouch along the margin, producing a small, sharp, triangular projection. Based on morphology, such implements are assumed to have been used for engraving or scoring dense organic materials, principally wood, bone, and antler. One graver, manufactured on a projectile point, is discussed with hunting implements.

Distribution and Summary

Artifacts classified as non-lithic tool manufacturing implements, excluding heavy woodworking tools, comprised 6.2% (n=148) of all stone tools recovered by survey. Although most (62.2%) were recovered from the Alluvial Terraces domain, numerous artifacts (primarily gravers and pièces esquillées) also were collected from tributary valleys, alluvial terraces of Tellico River, and upland landforms within the Upper Valley Uplands domain (Table 53). These artifacts reflect activities which Binford (1979:268) has referred to as "gearing up"--that is, the task of refurbishing or replacing personal gear that has worn out. With the exception of drills which probably were hafted, non-lithic tool manufacturing implements represent ad hoc tools or situational gear. Consequently, a majority of these implements were expected to occur archaeologically at their place of use. Drills, conversely, were expected to occur where re-hafting took place. In both instances, a general context associated with maintenance activities (i.e., at a residential site or field camp) is anticipated.

Table 53. Distribution of non-lithic tool manufacturing implements by landform.

Landform	Drill		Spokeshave		Denticulate		Pièce Esquillée		Graver	
	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
T-1 Terrace (LTRV)	3	.09	1	.03	1	.03	17	.53	1	.03
T-2 Terrace (LTRV)	1	.10	3	.30	5	.50	17	1.70	4	.40
>T-2 Terrace (LTRV)	5	.19	5	.19	4	.15	16	.59	1	.04
L. Tenn. Valley Slope	0	.00	0	.00	1	.03	0	.00	1	.03
Tellico River Valley	2	.12	2	.12	1	.06	17	1.00	0	.00
Tellico Valley Slope	0	.00	0	.00	0	.00	0	.00	0	.00
Tributary Valley	0	.00	0	.00	1	.03	3	.10	1	.03
Tributary Valley Slope	1	.03	1	.03	0	.00	10	.34	1	.03
Lower Valley Uplands	1	.01	0	.00	1	.01	2	.02	0	.00
Upper Valley Uplands	1	.01	1	.01	1	.01	8	.06	6	.04
Dissected Knobs	0	.00	0	.00	0	.00	0	.00	1	.09
Total	14		13		15		90		16	
Overall $\bar{X}$		.03		.03		.04		.21		.04

Note: $\bar{x}$ = mean artifact density (per sampling unit).

HEAVY WOODWORKING IMPLEMENTS

Ground Celt (Figure 32a-c)

Sample Size: 14.

Sampling Domain Distribution: 10 Alluvial Terraces, 1 Lower Valley Uplands, 3 Upper Valley Uplands.

Raw Material Distribution: 12 Slate, 2 Greenstone.

Description: This category of ground stone axes includes implements with a bi-convex working edge that are sub-triangular in form and have a tapered poll end. Celts were manufactured by direct percussion, pecking, grinding, and ultimately polishing of the bit to produce a sharp, even working edge. In Tellico Reservoir, ground celts occurred within the Woodland and Mississippian cultural contexts. Celts recovered during survey, with the exception of two whole celts recovered from Upper Valley Uplands sampling units (SU 646, 696) immediately adjacent to the Little Tennessee River valley, consisted primarily of fragments resulting from impact fracture.

Grooved Axe (Figure 32e)

Sample Size: 1.

Sampling Domain Distribution: 1 Dissected Knobs.

Raw Material Distribution: 1 Metasandstone.

Description: While grooved axes are similar to celts with respect to function and method of manufacture, they are morphologically distinct, having a generally subrectangular shape and a pronounced groove parallel to the long axis of the bit to facilitate hafting.

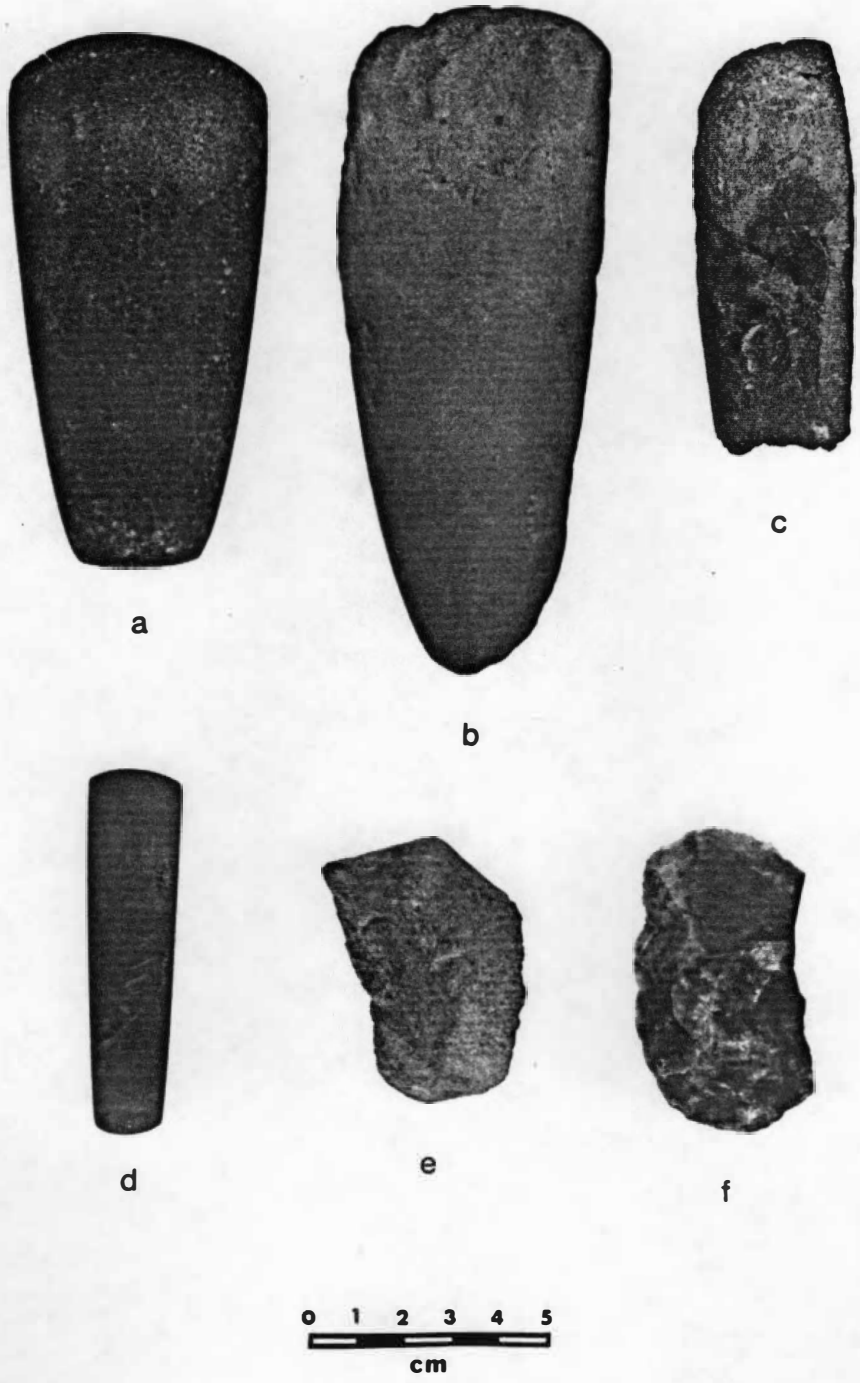


Figure 32. Woodworking implements. Celt (a-c); chisel (d); grooved axe (e); and adze (f).

Grooved axes were recovered from a Late Archaic context at the Iddins site (Chapman 1981:98).

Adze (Figure 32f)

Sample Size: 1.

Sampling Domain Distribution: 1 Lower Valley Uplands.

Raw Material Distribution: 1 Chalcedony.

Description: This chipped-stone implement is defined by a plano-convex, unifacial-retouched working edge, and probably was hafted perpendicular to the long axis of the bit.

Ground Chisel (Figure 32d)

Sample Size: 1.

Sampling Domain Distribution: 1 Alluvial Terraces.

Raw Material Distribution: 1 Slate.

Description: This implement is similar to a ground celt, having a bi-convex bit; however, it has parallel rather than tapered sides and is of considerably smaller size. Elsewhere within Tellico Reservoir, ground chisels have been recovered from Mississippian contexts (Kimball 1978:156).

Distribution and Summary

Heavy woodworking implements comprised less than one percent of all stone tools recovered. Because of the relatively large amount of labor represented by these implements, they probably were highly curated and would have entered an archaeological context slowly, mostly as fragments resulting from tool breakage. The occurrence of two complete celts and a complete chisel are best explained as either:

1) implements that were lost or cached and not subsequently retrieved; or 2) burial accompaniments that were disturbed at some point following interment.

Spatially, a majority of these implements were expected at residential sites where woodworking activities associated with tool and shelter construction activities were most intense. However, the initial extraction of wood from forested areas also would have produced a steady output of broken tools and tool fragments in an "off-site" context. Almost 65% of the heavy woodworking implements in the survey sample were associated with alluvial terraces within the Alluvial Terraces domain. The remainder occurred mostly within the Upper Valley Uplands (Table 54).

PLANT FOOD PROCESSING IMPLEMENTS

Mano (Figure 33c)

Sample Size: 2.

Sampling Domain Distribution: 2 Alluvial Terraces.

Raw Material Distribution: 2 Quartzite.

Description: A mano is defined as a cobble tool with one or more surfaces worn flat by heavy abrasion. Manos are hand-held implements that probably were used for grinding seeds.

Milling Stone (Figure 33d)

Sample Size: 1.

Sampling Domain Distribution: 1 Upper Valley Uplands.

Raw Material Distribution: 1 Quartzite.

Description: This artifact is a cobble tool that possesses a

Table 54. Distribution of heavy woodworking implements by landform.

Landform	Ground Celt n	Ground Celt $\bar{x}$	Grooved Axe n	Grooved Axe $\bar{x}$	Adze n	Adze $\bar{x}$	Ground Chisel n	Ground Chisel $\bar{x}$
T-1 Terrace (LTRV)	8	.25	0	.00	0	.00	0	.00
T-2 Terrace (LTRV)	1	.10	0	.00	0	.00	0	.00
>T-2 Terrace (LTRV)	1	.04	0	.00	0	.00	1	.04
L. Tenn. Valley Slope	0	.00	0	.00	0	.00	0	.00
Tellico River Valley	0	.00	1	.06	0	.00	0	.00
Tellico Valley Slope	0	.00	0	.00	0	.00	0	.00
Tributary Valley	0	.00	0	.00	0	.00	0	.00
Tributary Valley Slope	0	.00	0	.00	1	.03	0	.00
Lower Valley Uplands	1	.01	0	.00	0	.00	0	.00
Upper Valley Uplands	3	.02	0	.00	0	.00	0	.00
Dissected Knobs	0	.00	0	.00	0	.00	0	.00
Total	14		1		1		1	
Overall $\bar{X}$		.04		<.01		<.01		<.00

Note: $\bar{x}$ = mean artifact density (per sampling unit).

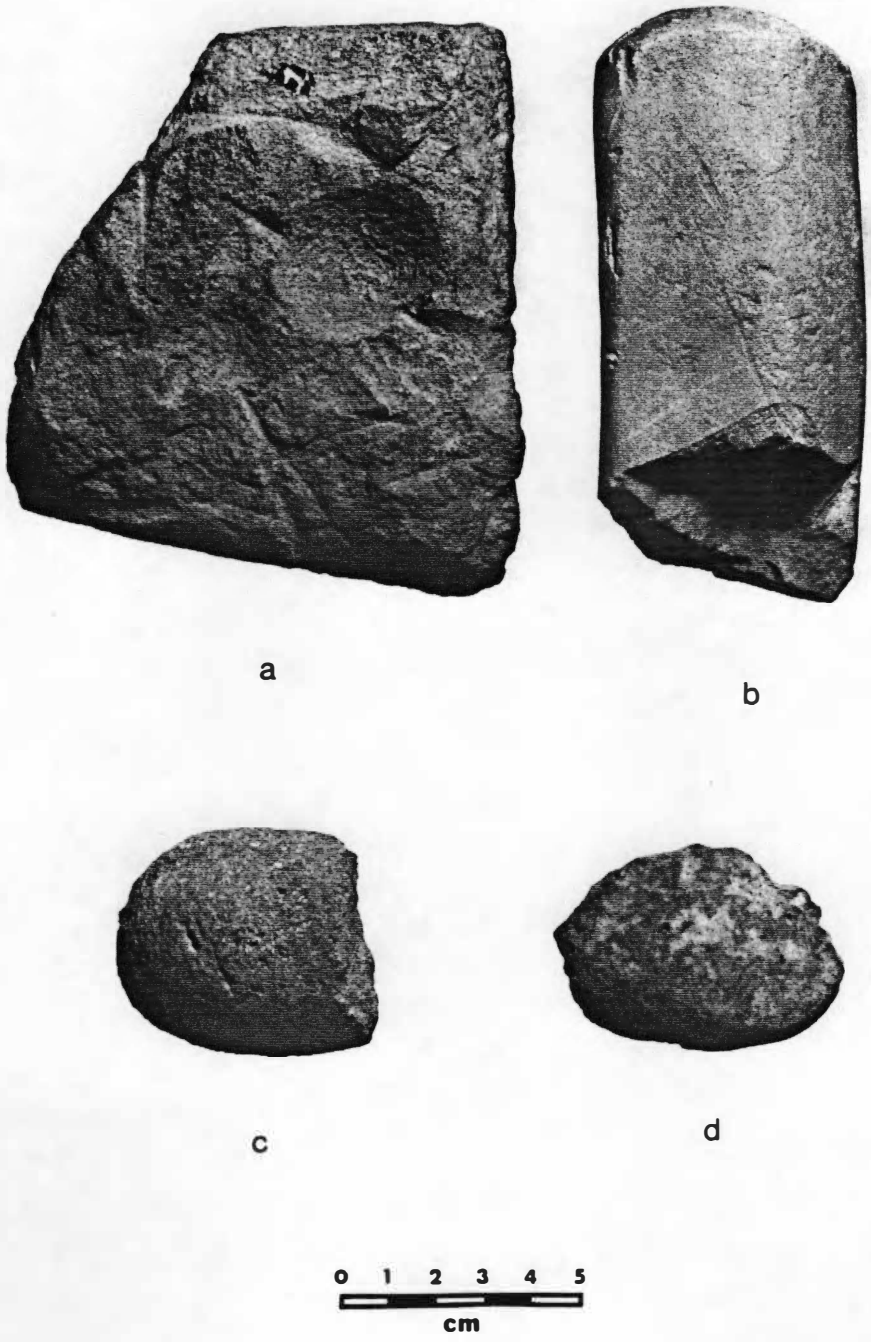


Figure 33. Plant food processing implements. Nutting stone (a); pestle (b); mano fragment (c); and milling stone fragment (d).

shallow concave depression on one surface. This depression, produced by heavy abrasion, probably resulted from seed grinding involving the use of a mano or pestle.

Pestle (Figure 33b)

Sample Size: 1.

Sampling Domain Distribution: 1 Alluvial Terraces.

Raw Material Distribution: 1 Slate.

Description: Pestles are conical cobble tools that possess a flat base worn smooth by heavy abrasion. Pestles probably functioned similar to manos, being used to grind or pound seeds and nuts.

Nutting Stone (Figure 33a)

Sample Size: 1.

Sampling Domain Distribution: 1 Alluvial Terraces.

Raw Material Distribution: 1 Sandstone.

Description: Nutting stones are large cobble or tabular rock tools that have one or more deep, cup-shaped depressions. The symmetry of the hemispherical depressions distinguish this tool category from pitted cobbles. As the name implies, nutting stones are thought to have served as anvils for processing nuts. Similar anvil stones without depressions and fist-sized hammerstones are used by the !Kung San of southern Africa for processing extremely hard-shelled mongongo nuts (Lee 1979:151, 198-199).

Distribution and Summary

Plant food processing implements, being represented by only five specimens, was the least frequent artifact class recognized during the

survey. Four of these artifacts were recovered from the lower alluvial terraces of the Little Tennessee River (Table 55). Plant processing tools represent site furniture--items that probably were cached at their place of use. Consequently, their distribution is seen as reflecting locations where plant food processing occurred. The fact that so few implements were recovered may be a result of: 1) the removal of such items by farmers or collectors, due to their large size and high visibility; 2) the use of either perishable materials or ad hoc cobble tools for plant processing; or 3) a failure to recognize such items as artifacts during survey. Given that all rocks were collected from sampling units during the initial survey of most of the Alluvial Terraces domain, collector bias is unlikely.

FISHING GEAR

Netsinker (Figure 27a-f)

Sample Size: 82.

Sampling Domain Distribution: 57 Alluvial Terraces, 1 Lower Valley Uplands, 1 Upper Valley Uplands, 23 Dissected Knobs.

Raw Material Distribution: 44 Conglomerate, 21 Quartzite, 6 Sandstone, 4 Slate, 3 Shale, 3 Metasandstone, 1 Metaquartzite.

Description: A netsinker is a cobble or cobble spall that possesses one or two opposing percussion notches on the lateral edges. Netsinkers are interpreted as fishing line weights, with notches serving to facilitate line attachment.

Table 55. Distribution of plant food processing implements by landform.

Landform	Mano		Milling Stone		Pestle		Nutting Stone	
	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
T-1 Terrace (LTRV)	1	.03	0	.00	1	.03	1	.03
T-2 Terrace (LTRV)	1	.10	0	.00	0	.00	0	.00
>T-2 Terrace (LTRV)	0	.00	0	.00	0	.00	0	.00
L. Tenn. Valley Slope	0	.00	0	.00	0	.00	0	.00
Tellico River Valley	0	.00	0	.00	0	.00	0	.00
Tellico Valley Slope	0	.00	0	.00	0	.00	0	.00
Tributary Valley	0	.00	1	.03	0	.00	0	.00
Tributary Valley Slope	0	.00	0	.00	0	.00	0	.00
Lower Valley Uplands	0	.00	0	.00	0	.00	0	.00
Upper Valley Uplands	0	.00	0	.00	0	.00	0	.00
Dissected Knobs	0	.00	0	.00	0	.00	0	.00
Total	2		1		1		1	
Overall $\bar{X}$		<.01		<.01		<.01		<.00

Note: $\bar{x}$ = mean artifact density (per sampling unit).

Distribution and Summary

Fishing probably was more a communal endeavor than an individual activity, as evidenced by the presence of several rock weirs along the lower Little Tennessee River (Kimball 1985; Ramsey 1981). These structures required considerable effort to construct, probably were communally maintained for generations, and, once constructed, would have defined the locations of intensive fishing activity. An association of weirs and netsinkers (as line weights) is suggested by James Adair (1775:432):

> The Indians have the art of catching fish in long crails, made with canes and hiccory splinters, tapered to a point. They lay these at a fall of water, where stones are placed in two sloping lines from each bank, till they meet together in the middle of the rapid stream, when the intangled fish are soon drowned. At such a place, I have known them to fasten a wreath of long grape vines together, to reach across the river, with stones fastened at proper distances to rake the bottom; they will swim a mile with it whooping, and plunging all the way, driving the fish into their large cane pots.

This general fishing technique (though possibly without line weights) was also observed along the lower Little Tennessee River by Henry Timberlake (Williams 1927:69), who observed:

> Building two walls obliquely down the river from either shore, just as they are near joining, a passage is left to a deep well or reservoir; the Indians then scaring the fish down the river, close the mouth of the reservoir with a large bush, or bundle made on purpose, and it is no difficult matter to take them with baskets, when inclosed within so small a compass.

Although this method of fishing probably existed over a long period of time during Southeastern prehistory, netsinkers as a recognizable artifact type appear to be restricted temporally to the Middle Archaic, Late Archaic, and Early Woodland periods. Comparative data on netsinker samples from five sites within Tellico Reservoir,

compiled and presented by Chapman (1981:95), suggest a gradual trend toward increased netsinker size over time.

Netsinkers, because their use is location-specific, are considered site furniture. These artifacts comprised almost 42% of all artifacts interpreted as site furniture and, as expected, were distributed primarily along the lower alluvial terraces of the Little Tennessee and Tellico rivers (Table 56).

PERSONAL ADORNMENT ITEMS

Earspool

Sample Size: 1.

Sampling Domain Distribution: 1 Alluvial Terraces.

Raw Material Distribution: 1 Chlorite Schist.

Description: Earspools are thin, hollow cylinders made of either ground stone or fired clay. Ground-stone earspools usually possess a distinct lip along the outside edges. The functional interpretation of these artifacts is based upon studies of similar artifacts from the Angel site in southern Indiana (Black 1967:459, 484). Within Tellico Reservoir, earspools are associated largely with the Early Mississippian period (Schroedl et al. 1985).

Bar Gorget (Figure 27i)

Sample Size: 5.

Sampling Domain Distribution: 4 Alluvial Terraces, 1 Dissected Knobs.

Raw Material Distribution: 3 Slate, 1 Shale, 1 Graphite.

Description: A bar gorget is a tabular stone pendant that has

Table 56. Distribution of fishing gear and personal adornment items by landform.

Landform	Fishing Gear: Netsinker n	Fishing Gear: Netsinker $\bar{x}$	Personal Adornment Items: Earspool n	Earspool $\bar{x}$	Gorget n	Gorget $\bar{x}$
T-1 Terrace (LTRV)	36	1.13	0	.00	3	.09
T-2 Terrace (LTRV)	15	1.50	1	.10	1	.10
>T-2 Terrace (LTRV)	6	.22	0	.00	0	.00
L. Tenn. Valley Slope	0	.00	0	.00	0	.00
Tellico River Valley	24	1.41	0	.00	1	.06
Tellico Valley Slope	0	.00	0	.00	0	.00
Tributary Valley	1	.03	0	.00	0	.00
Tributary Valley Slope	0	.00	0	.00	0	.00
Lower Valley Uplands	0	.00	0	.00	0	.00
Upper Valley Uplands	0	.00	0	.00	0	.00
Dissected Knobs	0	.00	0	.00	0	.00
Total	82		1		5	
Overall $\bar{x}$		.19		<.01		.01

Note: $\bar{x}$ = mean artifact density (per sampling unit).

been ground and shaped, and usually possesses two drilled holes in the center for attachment. Most of the specimens collected during the survey were small fragments of broken gorgets. Bar gorgets have been recovered from Early and Middle Woodland contexts within Tellico Reservoir (Bass 1979:216-217; Schroedl 1978b:141-144; Schroedl et al. 1985).

Distribution and Summary

Items of personal adornment such as those found during survey were expected to be associated with activities centered around residential sites. Whether these artifacts functioned as badges of status or were simply decorative is unknown. Given the amount of labor needed to manufacture most of these items, it is likely that they were highly curated and probably entered the archaeological record by breakage, loss, or as burial accompaniments. In fact, all of the specimens found were fragments. All of these artifacts were collected along the lower alluvial terraces of the Little Tennessee and Tellico rivers (Table 56).

HEARTH RESIDUE

Fire-Cracked Rock

Sample Size: 37,511.

Sampling Domain Distribution: 23,904 Alluvial Terraces, 74 Lower Valley Uplands, 914 Upper Valley Uplands, 12,619 Dissected Knobs.

Raw Material Distribution: 23,117 Quartzite, 9,849 Quartz, 2,747 Conglomerate, 987 Sandstone, 159 Metasandstone, 114 Shale, 102 Limestone, 100 Schist, 78 Metaquartzite, 72 Hornblende, 37 Slate, 28

Other Chert (Local), 25 Siltstone, 15 Dolomite, 14 Granite, 14 General Metamorphic, 10 Chert Residuum, 8 Knox Light Gray Banded Chert, 6 Other Chert (Non-local), 4 Knox Black Chert, 4 Knox Porcellaneous Chert, 4 Chalcedony, 3 Knox Dark Gray Chert, 3 Knox Dark Gray Banded Chert, 2 Knox Oolitic Chert, 2 Hematite, 2 Limonite, 2 Phyllite, 2 Gneiss, 1 Knox Mottled Chert.

Description: This category includes cobbles and cobble fragments that exhibit characteristics indicating exposure to intense heat, primarily angular fracture patterns, and change in color. These artifacts largely represent the residues of rock hearths.

Distribution and Summary

Fire-cracked rock was by far the most common artifact category, comprising 57.3% of the collection. Despite potential problems in detecting evidence of heat alteration on minimally utilized cobbles, the attributes of fracture and color are distinct enough to make fire-cracked rock extremely useful for recognizing archaeological sites which otherwise might have very low visibility. This artifact category represents debris resulting from maintenance rather than extraction-related activities; consequently, it is a key indicator of both residential sites and field camps that were used for extended periods of time. Although fire-cracked rock was recovered from all sampling domains, over 97% of the sample came from the Alluvial Terraces and Dissected Knobs domains. The overwhelming majority of the sample (almost 84%) came from the lower alluvial terraces of the Little Tennessee and Tellico rivers (Table 57).

Table 57. Distribution of hearth residue and architectural debris by landform.

Landform	Hearth Residue Fire-Cracked Rock n	$\bar{x}$	Architectural Debris Daub n	$\bar{x}$
T-1 Terrace (LTRV)	11,362	355.06	30	.94
T-2 Terrace (LTRV)	7546	754.60	24	2.40
>T-2 Terrace (LTRV)	4095	151.67	18	.67
L. Tenn. Valley Slope	24	.73	0	.00
Tellico River Valley	12,762	750.71	2	.12
Tellico Valley Slope	238	26.44	0	.00
Tributary Valley	165	5.69	0	.00
Tributary Valley Slope	255	8.79	0	.00
Lower Valley Uplands	8	.09	0	.00
Upper Valley Uplands	22	.15	0	.00
Dissected Knobs	1034	94.00	2	.18
Total	37,511		76	
Overall $\bar{X}$		88.26		.18

Note: $\bar{x}$ = mean artifact density (per sampling unit).

ARCHITECTURAL DEBRIS

Daub

Sample Size: 76.

Sampling Domain Distribution: 72 Alluvial Terraces, 4 Dissected Knobs.

Description: Daub is fired clay that represents either chinking from wattle-and-daub architecture, remnants of clay hearths, or floor remains. Daub fragments were distinguished from pottery sherds by their irregular shape, hardness, and lack of temper.

Distribution and Summary

Within Tellico Reservoir, daub is associated largely with sites that date to the Mississippian period. Given that no Woodland or Archaic period structures have been identified within the study area, it seems likely that pre-Mississippian houses were of somewhat less substantial construction and did not employ the technique of wattling and daubing. Daub was regarded as a direct indicator of residential site use. With the exception of four daub fragments from the Dissected Knobs domain, all daub was recovered along the alluvial terraces of the Little Tennessee River (Table 57).

COOKING VESSELS

Potsherd (Figure 34-35)

Sample Size: 785.

Sampling Domain Distribution: 784 Alluvial Terraces, 1 Lower Valley Uplands.

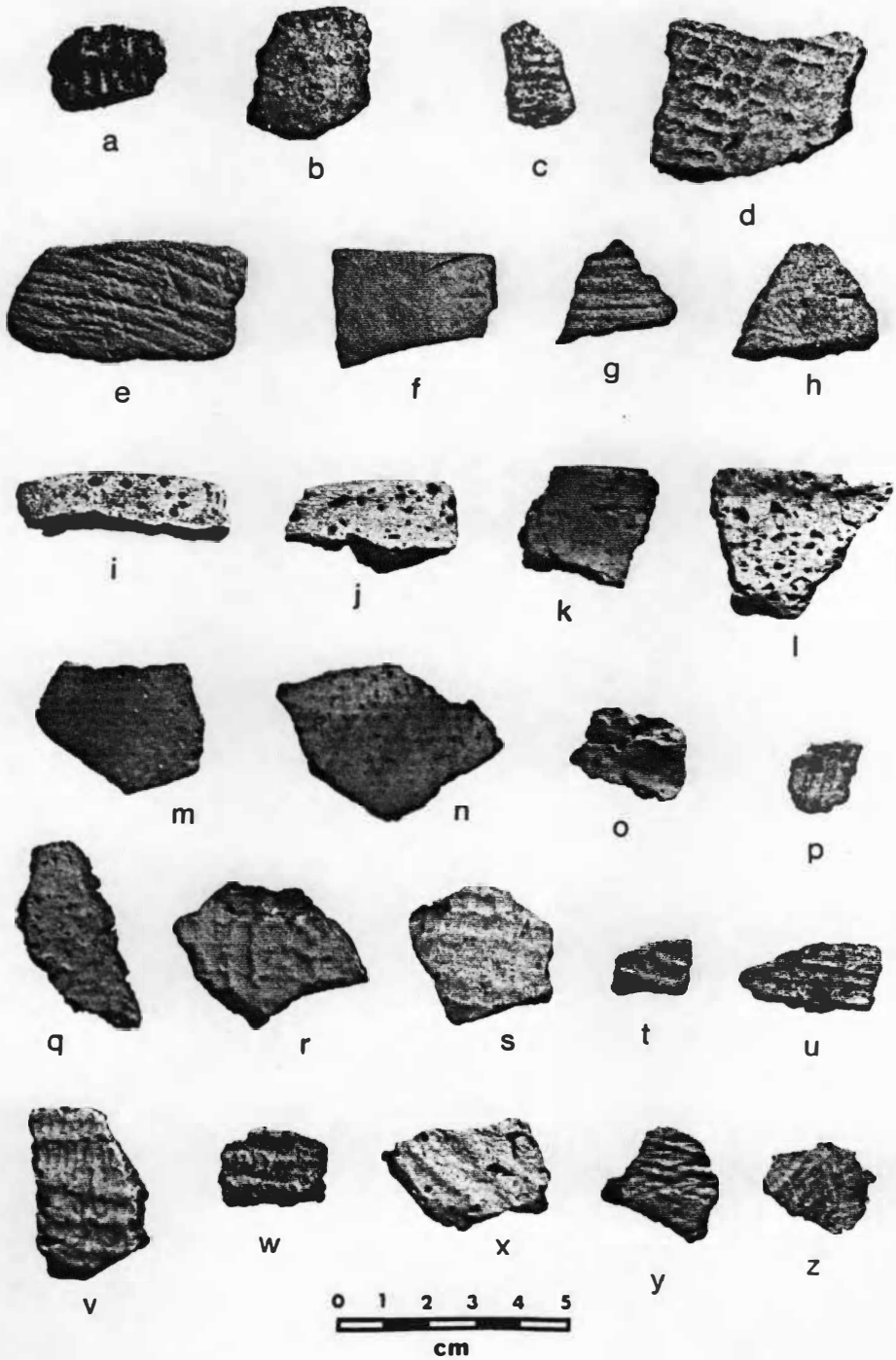


Figure 34. Woodland potsherds. Coarse quartz-tempered sherd (a); medium quartz-tempered sherds (b-d); sand-tempered sherds (e-h); and limestone-tempered sherds (i-z).

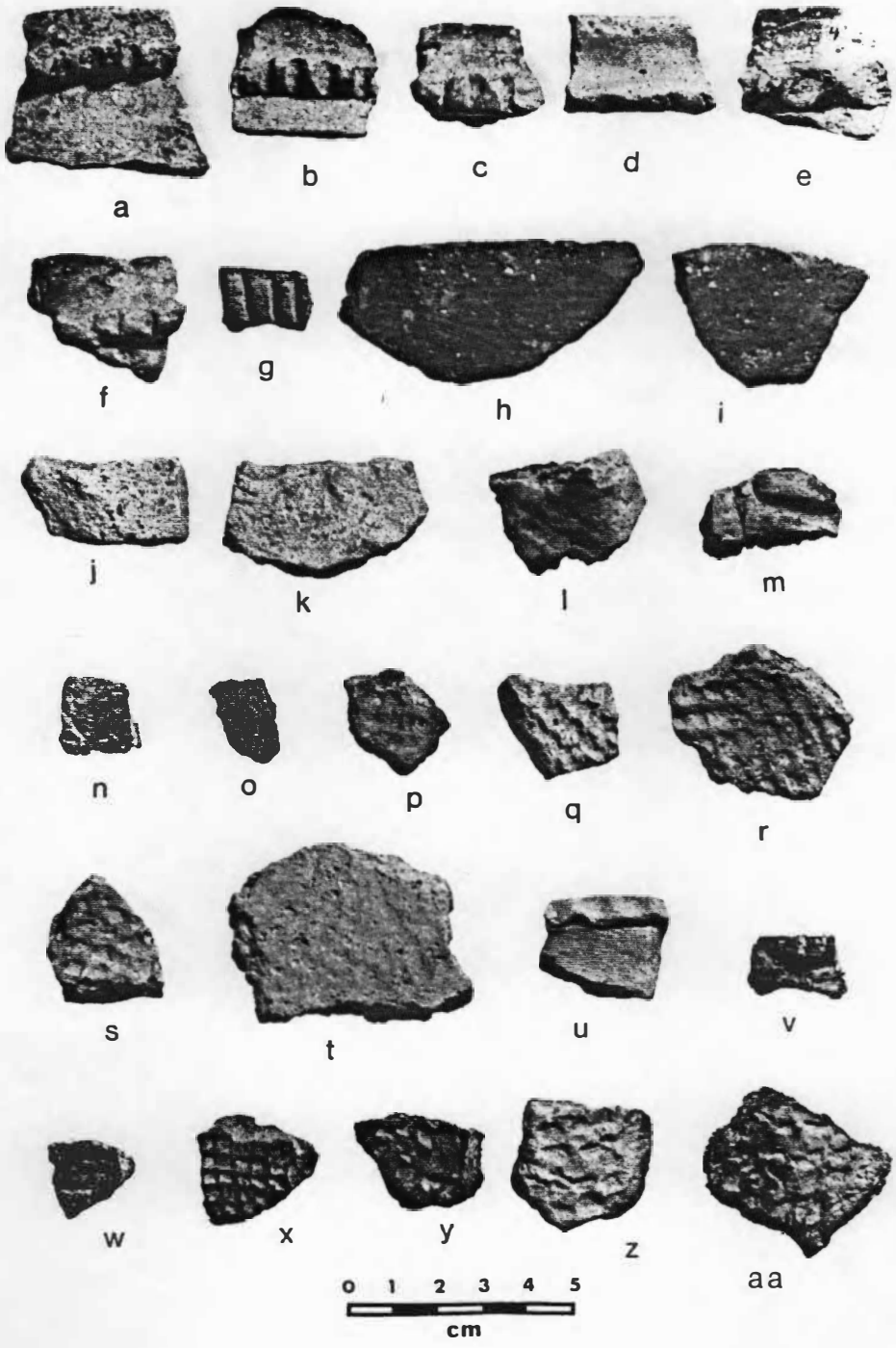


Figure 35. Mississippian potsherds. Shell-tempered sherds (a-t) and grit-tempered sherds (u-aa).

Description: This category included fragments of ceramic containers, mostly representing jar and bowl forms used in cooking, food storage, or food consumption. Potsherds were distinguished from daub by the presence of temper within the paste and the recognition of smoothed or treated surfaces. Within Tellico Reservoir, potsherds are only moderately resistant to the effects of mechanical and chemical weathering due to the acidity of local soils and a preference among aboriginal potters for using soluble, calcium carbonate materials (i.e., crushed limestone and shell) as tempering agents. As a consequence, sherds collected by surface survey usually were small (<2-4 cm), eroded, and fragile.

Stone Sherd (Figure 27g)

Sample Size: 25.

Sampling Domain Distribution: 20 Alluvial Terraces, 5 Dissected Knobs.

Description: A stone sherd is a fragment from a stone container, usually having a bowl form. All of the sherds within the sample were soapstone and represented vessels that were manufactured by carving, pecking, and grinding. Stone sherds were distinguished from non-sherds by the presence of smoothed, parallel surfaces and, if sufficiently large, by a slight curvature when viewed in profile.

Distribution and Summary

Both sherd categories represent domestic activities involving the use of non-perishable containers. All specimens were collected from the alluvial terraces of the Little Tennessee and Tellico rivers

(except for one potsherd collected along a primary tributary), and were conspicuously absent from all upland landforms (Table 58). Stone sherds and potsherds are associated with maintenance activities and therefore were expected to occur primarily at residential sites.

Because these artifact categories have relatively well-defined temporal distributions, they also were especially useful as chronological indicators. Carved-stone vessels are associated with the Late Archaic occupation of the study area (see Chapman 1981), whereas ceramic vessels were used extensively throughout the Woodland and Mississippian periods. The temporal model of sherd variability developed in Chapter V was used to classify sherds from the survey sample into these two broad temporal periods. Woodland sherds, including those specimens with coarse crushed quartz, medium crushed quartz, sand, and crushed limestone tempering, represented 44.5% of the sherd sample and were almost evenly distributed along the T-1 and T-2 terraces of the Little Tennessee River (as reflected by mean sampling unit frequencies). Mississippian pottery (shell-tempered and grit-tempered pastes), conversely, were strongly associated with the T-2 terrace. As will be shown in Chapter VII, these differences mirror a major shift in settlement pattern at the beginning of the Mississippian period. Surprisingly, few sherds were recovered along Tellico River, possibly reflecting less intensive use or differential use of this valley following the Archaic period. A more specific temporal distribution of potsherds recovered by survey is presented in Table 59. This table further illustrates the dissimilarity in spatial distribution between Woodland and Mississippian (specifically Overhill

Table 58. Distribution of cooking vessel fragments by landform.

Landform	Stone Sherd (Late Archaic) n	$\bar{x}$	Potsherd (Woodland) n	$\bar{x}$	Potsherd (Mississippian) n	$\bar{x}$	Potsherd* (Wood./Miss.) n	$\bar{x}$
T-1 Terrace (LTRV)	19	.59	66	2.06	112	3.50	192	6.00
T-2 Terrace (LTRV)	1	.10	10	1.00	316	31.60	65	6.50
>T-2 Terrace (LTRV)	0	.00	2	.07	11	.41	6	.22
L. Tenn. Valley Slope	0	.00	0	.00	0	.00	0	.00
Tellico River Valley	5	.29	1	.06	1	.06	1	.06
Tellico Valley Slope	0	.00	0	.00	0	.00	0	.00
Tributary Valley	0	.00	1	.03	0	.00	0	.00
Tributary Valley Slope	0	.00	0	.00	0	.00	0	.00
Lower Valley Uplands	0	.00	0	.00	0	.00	0	.00
Upper Valley Uplands	0	.00	0	.00	0	.00	0	.00
Dissected Knobs	0	.00	0	.00	0	.00	0	.00
Total	25		80		440		264	
Overall $\bar{x}$		.06		.19		1.04		.62

Note: $\bar{x}$ = mean artifact density (per sampling unit).
* A majority of these sherds probably reflect Woodland components.

Table 59. Distribution of specific sherd categories by landform.

Cultural Phase Sherd Category	Landform[1] T-1	T-2	>T-2	TRV	TRIB	Total
Woodland Period						
Watts Bar Phase						
CQ FM	1	-	-	-	-	1
CQ CM	6	3	-	-	-	9
Patrick Phase						
MQ CMS	2	-	-	-	-	2
MQ CKS	1	-	-	-	-	1
L FM	7	-	-	-	-	7
L CKS	8	-	-	-	-	8
Icehouse Bottom Phase						
MQ P	5	-	-	-	1	6
MQ SS	2	-	-	-	-	2
MQ BR	1	-	-	-	-	1
S P	10	1	-	-	-	11
S SS	1	-	-	-	-	1
S CCS	1	-	-	-	-	1
S Indeterminate	10	4	1	1	-	16
L SS	4	-	-	-	-	4
L Pode	1	-	-	-	-	1
Indeterminate						
MQ Indeterminate	6	2	1	-	-	9
Mississippian Period						
Martin Farm Phase						
L CMZ	4	-	-	-	-	4
L I	1	-	-	-	-	1
Hiwassee Island Phase						
SH FM	2	-	-	-	-	2
SH LOOP	1	-	-	-	-	1
Dallas Phase						
SH CMS	3	-	-	-	-	4
SH MOD	1	-	-	-	-	1
Overhill Phase						
SH CKS	2	14	-	-	-	16
SH SS	-	4	-	-	-	4
SH FILAP	3	9	-	-	-	12
SH I	-	1	-	-	-	1
G P	2	19	-	-	-	21
G SS	-	1	-	-	-	1
G CKS	-	6	-	-	-	6
G FILAP	-	1	-	-	-	1
G I	-	1	-	-	-	1
G Indeterminate	2	8	-	-	-	10
Indeterminate						
SH P	53	137	8	-	-	198
SH CMZ	1	-	-	-	-	1
SH Indeterminate	37	115	2	1	-	155
Woodland-Mississippian Periods*						
L P	112	26	4	-	-	142
L CMS	6	-	1	-	-	7
L Indeterminate	74	39	1	1	-	115
Total	370	391	19	3	1	784

* These sherds probably reflect Woodland components.

[1] Landform codes: T-1 = T-1 Terrace (LTRV); T-2 = T-2 Terrace (LTRV); >T-2 = >T-2 Terrace (LTRV); TRV = Tellico River Valley; TRIB = Tributary Valley.

phase) potsherds. Because most of the Martin Farm, Hiwassee Island, and Dallas phase pottery was temporally non-diagnostic, these phases are almost certainly under-represented.

OVERALL SPATIAL DISTRIBUTIONS

In the preceding section, the spatial distribution of artifacts from the probabilistic survey was considered separately for each artifact group. For each group, it was shown that artifact densities were significantly greater within the Alluvial Terraces sampling domain and on alluvial landforms adjacent to the Little Tennessee and Tellico rivers. Also, some artifact classes were entirely absent on certain landforms. The obvious implications of these observations are that: 1) there are spatial inequalities in the archaeological record of the study area that can be monitored specifically by landform distribution and more generally as a dichotomy between valley and upland habitats; and 2) this spatial pattern can be interpreted as a direct manifestation of differential land use.

Despite these observations, at least five questions remain that are of direct importance to understanding the observed pattern. First, how strong are the differences in artifact distributions across the eleven recognized landforms? Second, how well does a valley-upland dichotomy hold up when artifact distributions are considered collectively? Third, given significant differences in artifact distributions, are these differences related to the kinds of artifacts that occur as well as overall artifact density? Fourth, what specific land uses can be inferred from the observed artifact

distributions? And finally, what evidence exists for changes in the overall land use patterns over time?

In order to address these questions, a series of multivariate statistical analyses were performed on the survey data. Specifically, principal component factor analyses were conducted to address the first four questions while variability over time was assessed in part by nearest neighbor discriminant analysis. All of the statistical procedures used were developed by SAS Institute, Inc. (1982).

Functional Variability

Principal component factor analysis was undertaken to assess artifact variability among the 11 landform categories and to evaluate landform differences relative to artifact content. Prior to performing this analysis, the 48 artifact classes were re-combined into eight groups representing different organizational/systemic contexts (see Table 39).

Four of these groups--Situational Gear 1, Situational Gear 2, Personal Gear, Site Furniture—reflect distinctions in terms of the technological organization of tools (Binford 1979:261). Situational gear represents those discarded tools which, based on morphological characteristics, are considered to be responsive, and was divided into two groups to separate cutting tools (utilized and retouched flakes--Situational Gear 1) from other ad hoc tools (Situational Gear 2). Personal gear, conversely, consists of formalized tools, usually hafted, that are anticipatory in character. Projectile points are the dominant constituent of this group. Site furniture includes items that are both anticipatory and site-specific in terms of use, and

which probably were cached at a site when not in use. Two additional groups--Maintenance Items and Fire-Cracked Rock--are similar to site furniture in that they largely represent the residues of residential site furnishings. Maintenance Items consist primarily of potsherds and daub. Finally, two groups of lithic reduction debris are defined. The first group--Lithic Debris 1--includes primary, bifacial, and non-specified lithic reduction debris. The second group--Lithic Debris 2--represents residues of bipolar and blade reduction techniques. The measurement of these variables (i.e., artifact groups) on each landform consisted of the mean artifact density per sampling unit (Tables 60-61).

Two separate principal component analyses were performed. The first analysis (SAS's FACTOR procedure, PRINCIPAL method, with MINEIGEN=1) resulted in a single factor solution, explaining 84.17% of the total variance (Table 62). All variables contributed to the Factor 1 pattern with significantly high loadings, reflecting a strong positive correlation among all variables in terms of artifact density. In order to examine variability among landforms relative to the single factor solution, derived factor scores were used to plot each landform along a continuum (Figure 36). When plotted, several relevant patterns became apparent. First, valley landforms and upland landforms (including tributary valleys that dissect the uplands) segregated along the continuum, lending support to the idea of a valley-upland land use dichotomy. A factor score of 0 represents a reasonable cut-off point separating the two groups. Since Factor 1 represents a measure of artifact density, negative factor scores

Table 60. Mean density of artifacts representing organizational/systemic contexts (by landform).

Landform	Situational Gear 1	Situational Gear 2	Personal Gear	Site Furniture	Maintenance Items	Fire-Cracked Rock	Lithic Debris 1	Lithic Debris 2
T-1 Terrace (LTRV)	12.32	.99	2.50	2.26	13.58	355.06	129.04	14.40
T-2 Terrace (LTRV)	34.50	3.80	5.30	3.50	42.10	754.60	249.00	12.90
>T-2 Terrace (LTRV)	10.23	1.53	3.88	.85	1.81	151.67	260.41	18.56
L. Tenn. Valley Slope	.60	.06	.39	.06	.06	.73	10.22	1.57
Tellico River Valley	11.48	1.89	4.65	2.06	1.71	750.71	184.54	23.88
Tellico Valley Slope	1.78	.11	.22	.15	.11	26.44	26.11	3.88
Tributary Valley	2.45	.19	.51	.10	.03	5.69	29.65	3.14
Tributary Valley Slope	5.07	.60	.62	.03	.03	8.79	69.66	4.77
Lower Valley Uplands	.11	.04	.08	.01	.03	.09	1.29	.16
Upper Valley Uplands	.83	.17	.39	.04	.01	.15	12.78	1.78
Dissected Knobs	.27	.18	.55	.09	.18	94.00	22.81	3.73

Table 61. Correlation matrix used in the principal component analyses.

	Situational Gear 1	Situational Gear 2	Personal Gear	Site Furniture	Maintenance Items	Fire-Cracked Rock	Lithic Debris 1	Lithic Debris 2
Situational Gear 1	1.00	.97	.86	.93	.94	.84	.82	.60
Situational Gear 2		1.00	.93	.91	.86	.88	.88	.70
Personal Gear			1.00	.89	.67	.91	.96	.90
Site Furniture				1.00	.86	.93	.79	.72
Maintenance Items					1.00	.70	.60	.33
Fire-Cracked Rock						1.00	.76	.79
Lithic Debris 1							1.00	.88
Lithic Debris 2								1.00

Table 62. Results of the first principal component analysis (with MINEIGEN=1).

Variable	FACTOR PATTERN Factor 1
Situational Gear 1	.95
Situational Gear 2	.98
Personal Gear	.97
Site Furniture	.96
Maintenance Items	.81
Fire-Cracked Rock	.93
Lithic Debris 1	.91
Lithic Debris 2	.81
Eigenvalue	6.73
% of Variance Explained	84.17

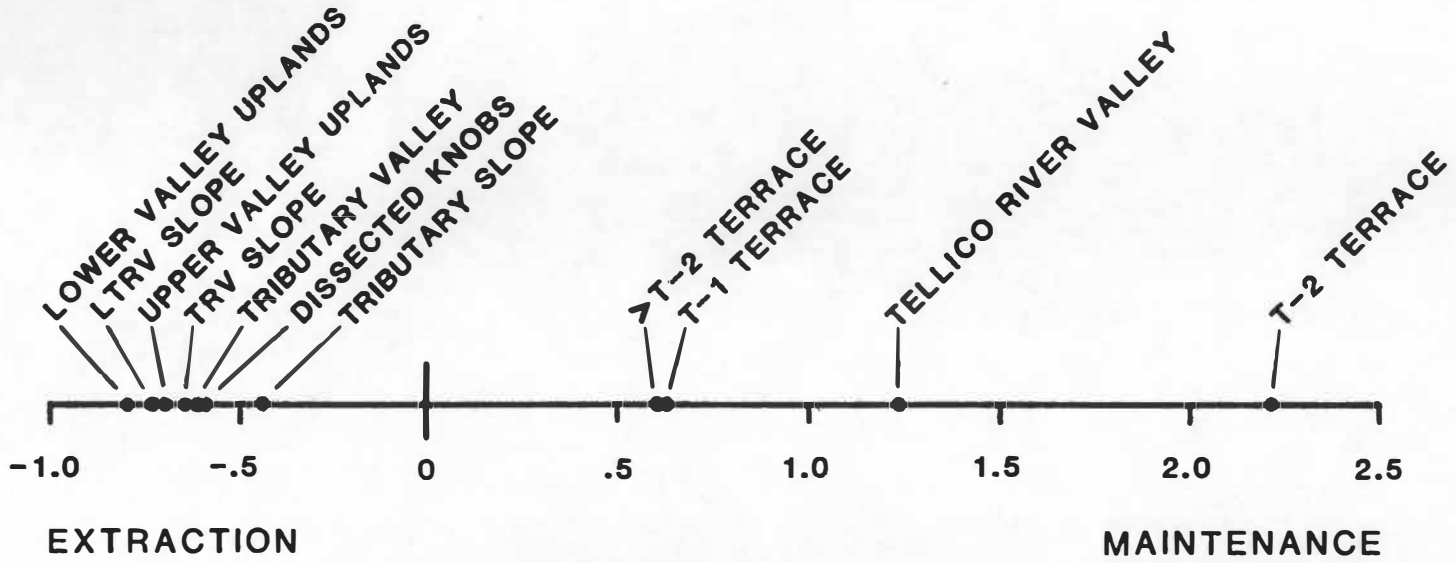


Figure 36. Relative positions of landforms defined by Factor 1.

reflect diffusely distributed, "low bulk" activities with only limited archaeological visibility. High positive factor scores, represented by all four alluvial valley landforms, indicate spatially concentrated, "high bulk" activities with conspicuous archaeological visibility. Given the tight clustering of the upland landforms relative to Factor 1, it is hypothesized that each experienced similar use. In short, there is no evidence that the various upland landforms were differentially exploited. Conversely, considerable variability exists among the valley landform artifact samples. To examine this variability further, a second principal component analysis was performed.

The second analysis (with NFACTOR=2 and VARIMAX rotation) produced a 2-factor solution, accounting for 95.47% of the total variance (Table 63). Factor 1 was defined by high factor loadings for Situational Gear 1, Situational Gear 2, Site Furniture, and Maintenance Items, and represents a measure of residential site activity. The positive correlation of situational gear with site furniture and maintenance items suggests that residential site use within the study area can be characterized by high densities of discarded ad hoc tools. This contrasts somewhat with Binford's (1979:267) suggestion that the presence of expedient tools within the archaeological record is usually characteristic of resource extraction activity, and reflects the fact that, within Tellico Reservoir, tool assemblages from all time periods are comprised predominantly of non-formalized tools, particularly utilized and retouched flakes. This situation probably is due at least in part to the local

Table 63. Results of the second principal component analysis (with NFACTOR=2).

Variable	ROTATED FACTOR PATTERN Factor 1	Factor 2
Situational Gear 1	.88	.46
Situational Gear 2	.78	.60
Personal Gear	.54	.83
Site Furniture	.77	.58
Maintenance Items	.98	.16
Fire-Cracked Rock	.62	.70
Lithic Debris 1	.46	.83
Lithic Debris 2	.17	.98
Eigenvalue	6.73	.90
% of Variance Explained	84.17	95.47

occurrence of high quality lithic raw materials. Factor 2 is defined by high loadings for Lithic Debris 1, Lithic Debris 2, and Personal Gear, and represents stone tool manufacture and replacement. Positive values for both factors indicate maintenance activities associated with residential site use. Conversely, negative values reflect resource extraction. Implicit in this interpretation is that resource extraction, when viewed at a regional scale, will not be manifested by the occurrence of unique artifacts which are absent from residential site collections; rather, such activity will be represented by a substantially less dense subset of artifacts normally found at residential sites.

A bivariate plot of the 11 landform categories relative to Factors 1 and 2 is presented in Figure 37. As with the first factor analysis, all upland landforms remained tightly clustered, and reflect negative scores for both factors. The analysis results did, however, provide significant new information about variability among the valley landforms. The placement of the T-1 and T-2 alluvial terraces relative to Factor 1 indicates the overall importance of maintenance-related artifacts to activities occurring on these landforms; conversely, the older alluvial terraces (>T-2) and Tellico alluvial valley are defined by high positive scores for Factor 2 and negative scores for Factor 1, and reflect both the importance of tool manufacture and the relative unimportance of maintenance activities on these landforms. As will be shown below, this overall pattern of variability among the valley landforms is due in large part to

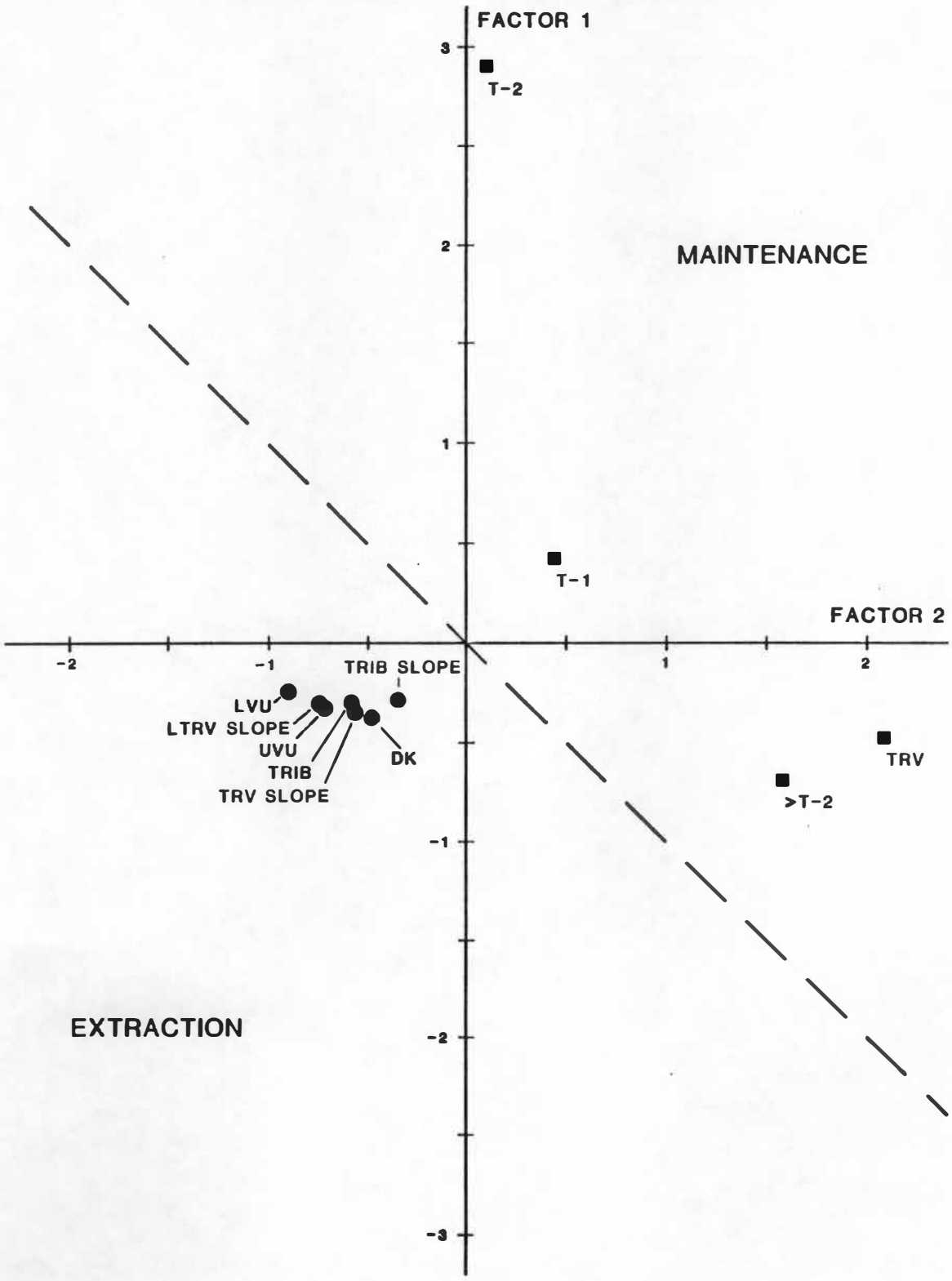


Figure 37. Bivariate plot of landforms based on factor scores.

temporally specific and possibly functionally specific land use differences.

Specific differences in artifact occurrence among the valley and upland landforms are illustrated more clearly in Figure 38. This bar graph shows the mean artifact density for each of the 19 activity groups across landforms, with densities from each group standardized to $\bar{x}=0$ and sd=1. As with the principal component analyses, these data displayed a marked discontinuity in artifact distribution between valley and upland landforms.

Substantial homogeneity among artifact collections from upland landforms is indicated, with little variability in density among artifact groups. With regard to the valley landforms, the T-2 terrace displayed the highest artifact densities for most tool categories and habitation-related items. In terms of artifact density, this terrace clearly was the most intensively utilized landform. As will be seen in Chapter VII, this pattern reflects the focalization of late Mississippian Dallas and Overhill Cherokee occupations on this landform.

The Tellico River valley, while possessing relatively high densities for only some tool categories, produced significantly large densities for acquired raw material and most categories of lithic reduction debris. This artifact distribution, together with the general paucity of artifacts classified as site furniture (excepting fishing implements), suggests that the Tellico River valley may have experienced only marginal occupation when compared to the lower Little Tennessee River valley. The high densities of debitage and raw

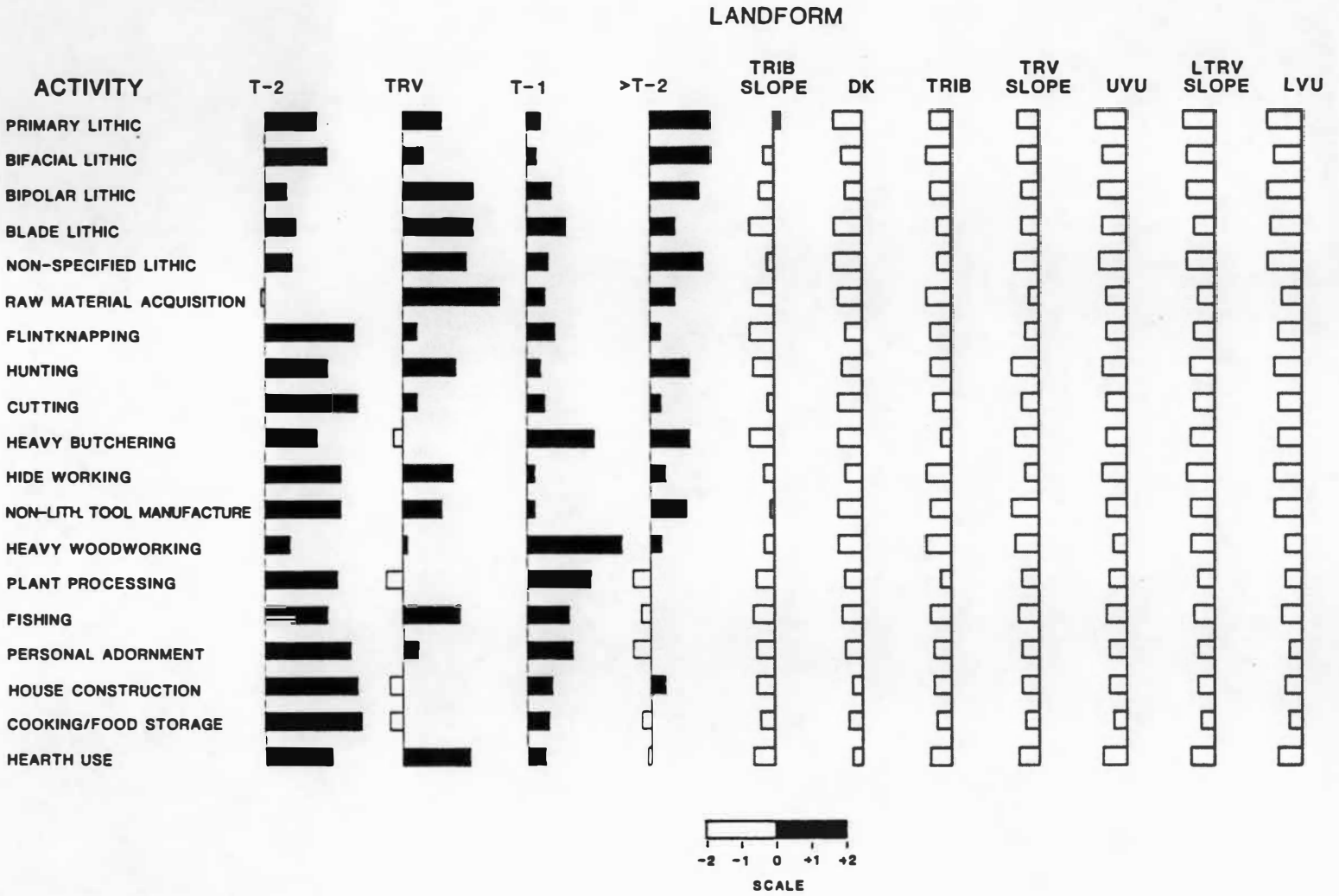


Figure 38. Mean artifact densities by landform for the 19 activity groups (standardized to $\bar{x}$=0 and sd=1 for each group).

material are more likely due to the presence of Knox chert and chalcedony outcrops along this river (see Kimball 1985:Figure 32).

The T-1 terrace sample is difficult to interpret since all activity groups were almost certainly under-represented due to the occurrence of deeply stratified Archaic period deposits. It is suggested that, in the absence of stratification, surface artifact assemblages from the T-1 terrace would compare favorably with those from the T-2 terrace but with greater representation of Archaic and Woodland period occupations. Despite this inherent sampling bias, significantly high densities were observed for several large-tool categories. Given only moderate densities for most other tool categories, it is tempting to view this pattern as a possible consequence of "size effect"--that is, the tendency for large-sized objects that have a high re-use potential to migrate upward as an archaeological deposit is forming (Baker 1978; Binford 1979:264).

Finally, artifacts collected from the older alluvial terraces (>T-2) of the Little Tennessee River consisted largely of lithic reduction debitage, and suggest primarily activities associated with tool manufacture and replacement. Given generally low densities for most tool categories, this collection suggests considerably less intensive use of this landform class when compared with the other valley landforms. Though inconclusive in this analysis, use of these older terraces may have been limited mostly to temporary habitation and logistical (i.e., hunting) encampments.

Temporal Variability

The ability to view land use patterning from a diachronic perspective was somewhat limited by the fact that most artifacts lack physical characteristics which allow their assignment to a particular time period, and that those artifacts which are temporally diagnostic only rarely occurred within surface collections. This situation was compounded further by the fact that archaeological sites in the study area were often the products of multiple occupations. In order to cope with these inherent problems, temporal variability in land use was considered only in a general manner. Time periods were broadly defined in order to maximize the use of the survey samples. Although such an approach prevented the potential recognition of temporally specific patterning at the phase level, it was consistent with the quality of the extant database.

Based on preceding analyses, landforms were divided into two groups (valley and upland) according to topographical characteristics and the kinds and frequencies of artifacts which occurred on them. It has been shown that valley artifact samples are largely representative of maintenance activities associated with residential site use while upland samples are best interpreted as resulting from resource extraction activities. In order to determine if this general land use pattern persisted over time, artifact samples (probabilistic sampling units or SU's) from each landform category were divided into four groups according to the presence or abence of temporally diagnostic artifacts. These groups were defined as follows: 1) Early - SU's with diagnostic artifacts attributable only to the Early Archaic through

Early Woodland periods; 2) Late - SU's containing temporally diagnostic artifacts associated only with the Middle Woodland through Late Mississippian periods; 3) Early/Late - SU's with material indicative of both Early and Late occupations; and 4) None - SU's that yielded no temporally diagnostic artifacts. This latter group, containing 289 sampling units (163 of which did not produce any artifacts) were excluded from further analysis.

Although segmenting time in this way was pragmatically advantageous since it permitted the use of several samples which could be temporally classified solely on the basis of debitage (see Chapter V), the point of separation between Early and Late also generally coincides with the period of gradual shift throughout much of the interior Southeast from a hunter-gatherer to more agriculturally based subsistence systems. For this reason, the Early-Late dichotomy was acceptable as a basis for studying temporal variability.

Evaluation of temporal variability in land use was based on the results of a nearest neighbor discriminant analysis. Nearest neighbor analysis is a nonparametric method for classifying observations into previously defined groups based on the values of one or more quantitative variables. The objective of this analysis was to use the total artifact densities from the 11 landform categories to empirically define valley and upland landform groups (based on the 19 activity groups), and then to classify temporally identified sub-samples of artifacts from each landform into one of the two landform groups. Deviations in expected classification formed the basis for evaluating temporal differences in land use. The nearest

neighbor analysis (SAS's NEIGHBOR procedure with equal prior probabilities) classified landform samples based on the highest proportion of 3-nearest neighbors, using Euclidean distance. Artifact densities for each activity group within each temporal group were standardized to x=0 and sd=1 prior to classification. Unstandardized data used in the analysis are presented in Tables 64-67. Analysis results are presented in Tables 68-69.

All landforms were correctly classified using the total artifact sample. Of the temporally defined sub-samples, all samples representing Early/Late occupations were correctly classified while several mis-classifications occurred with samples representing only Early and only Late occupations. Artifact samples from the T-2 terrace of the Little Tennessee River and Tellico River Valley, identified as Late, were classified into the upland group. Both landforms are represented by a single sampling unit and probably reflect poorly sampled residential sites. Of the 11 landform samples representing Early occupations, four were mis-classified, which indicates a more significant departure from the overall land use pattern. The T-1 Terrace and Tellico River Valley samples were classified into the upland group while the Tellico Valley Slope and Tributary Valley samples were classified into the valley group. Mis-classification of the T-1 Terrace sample was probably due to an insufficient sample of artifacts since most Early components on this landform were buried under alluvial sediments. Although mis-classification of the Tellico River Valley sample also may be a spurious result due to inadequate sample size, the classification of the

Table 64. Artifact densities by landform.

Activity Group	T-1 Terrace (LTRV)	T-2 Terrace (LTRV)	>T-2 Terrace (LTRV)	L.Tenn. Valley Slope	Tellico River Valley	Tellico Valley Slope	Trib. Valley	Trib. Valley Slope	Lower Valley Uplands	Upper Valley Uplands	Dissected Knobs
Flintknapping	.79	1.80	.56	.06	.59	.15	.04	.00	.00	.02	.09
Primary Reduction	31.09	55.20	59.63	2.40	46.12	7.78	8.90	25.76	.19	2.96	4.27
Bifacial Reduction	67.67	160.20	154.44	3.97	87.47	13.00	9.27	29.48	.36	5.44	14.18
Bipolar Reduction	12.00	10.80	16.63	1.21	20.41	3.44	2.59	4.49	.14	1.57	3.64
Blade Reduction	2.40	2.10	1.93	.36	3.47	.44	.55	.28	.02	.21	.09
Misc. Reduction	30.28	33.60	46.34	3.85	50.95	5.33	11.48	14.42	.74	4.38	4.36
Raw Material Acquisition	.37	.20	.44	.06	1.06	.11	.00	.03	.02	.01	.00
Hunting	2.50	5.30	3.88	.39	4.65	.22	.51	.62	.08	.39	.55
Cutting	11.85	34.10	9.90	.60	11.42	1.78	2.38	5.07	.11	.82	.27
Heavy Butchering	.47	.40	.33	.00	.06	.00	.07	.00	.00	.01	.00
Hide Working	.28	.80	.33	.00	.59	.11	.03	.14	.00	.04	.09
Non-Lithic Tool Manufacture	.71	3.00	1.20	.06	1.30	.00	.16	.46	.04	.13	.09
Woodworking	.25	.10	.07	.00	.06	.00	.00	.03	.01	.02	.00
Plant Food Processing	.09	.10	.00	.00	.00	.00	.03	.00	.00	.00	.00
Fishing	1.13	1.50	.22	.00	1.41	.00	.03	.00	.00	.00	.00
Personal Adornment	.12	.20	.00	.00	.06	.00	.00	.00	.01	.00	.00
Hearth Use	355.06	754.60	151.67	.73	750.71	26.44	5.69	8.79	.09	.15	94.00
Architecture	.94	2.40	.67	.00	.12	.00	.00	.00	.00	.00	.18
Cooking	12.15	39.30	.70	.00	.47	.00	.03	.00	.00	.00	.00

Table 65. Artifact densities for Early period samples by landform.

Activity Group	T-1 Terrace (LTRV)	T-2 Terrace (LTRV)	>T-2 Terrace (LTRV)	L.Tenn. Valley Slope	Tellico River Valley	Tellico Valley Slope	Trib. Valley	Trib. Valley Slope	Lower Valley Uplands	Upper Valley Uplands	Dissected Knobs
Flintknapping	.03	.10	.04	.06	.06	.00	.00	.00	.00	.01	.00
Primary Reduction	.06	2.30	1.30	.85	.18	6.67	5.28	.00	.01	.15	.36
Bifacial Reduction	.36	6.50	4.11	2.12	.35	11.78	4.45	.03	.02	.25	.45
Bipolar Reduction	.03	.40	.41	.39	.29	3.11	1.28	.00	.03	.06	.36
Blade Reduction	.03	.00	.15	.09	.00	.44	.28	.00	.00	.01	.00
Misc. Reduction	.24	1.40	4.52	.73	.35	5.11	5.07	.00	.01	.26	.00
Raw Material Acquisition	.00	.00	.04	.00	.00	.11	.03	.00	.00	.01	.00
Hunting	.03	.10	.41	.24	.06	.22	.21	.03	.07	.08	.09
Cutting	.09	1.10	.96	.30	.06	2.56	1.41	.00	.02	.08	.00
Heavy Butchering	.03	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00
Hide Working	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00	.00
Non-lithic Tool Manufacture	.00	.00	.07	.00	.06	.00	.14	.00	.00	.00	.09
Woodworking	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Plant Food Processing	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Fishing	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Personal Adornment	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Hearth Use	3.24	9.70	2.67	.48	9.18	25.44	.24	.31	.00	.14	.00
Architecture	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Cooking	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

Table 66. Artifact densities for Late period samples by landform.

Activity Group	T-1 Terrace (LTRV)	T-2 Terrace (LTRV)	>T-2 Terrace (LTRV)	L.Tenn. Valley Slope	Tellico River Valley	Tellico Valley Slope	Trib. Valley	Trib. Valley Slope	Lower Valley Uplands	Upper Valley Uplands	Dissected Knobs
Flintknapping	.03	.00	.04	.00	.00	.00	.03	.00	.00	.00	.00
Primary Reduction	2.36	.00	1.56	.00	.53	.00	.52	.00	.00	.21	.45
Bifacial Reduction	4.00	.30	4.07	.00	1.18	.00	1.34	.00	.00	.32	3.18
Bipolar Reduction	.58	.00	1.07	.00	.12	.00	.38	.00	.00	.08	.64
Blade Reduction	.06	.00	.19	.00	.06	.00	.07	.00	.00	.04	.00
Misc. Reduction	1.33	.00	1.85	.00	.65	.00	.34	.00	.00	.17	.73
Raw Material Acquisition	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Hunting	.18	.10	.07	.00	.00	.00	.14	.00	.00	.04	.00
Cutting	.82	.10	.70	.00	.06	.00	.14	.00	.00	.11	.00
Heavy Butchering	.03	.00	.07	.00	.00	.00	.03	.00	.00	.00	.00
Hide Working	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09
Non-lithic Tool Manufacture	.03	.00	.11	.00	.06	.00	.00	.00	.00	.01	.00
Woodworking	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
Plant Food Processing	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Fishing	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Personal Adornment	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Hearth Use	3.06	.00	41.11	.00	5.47	.00	1.86	.00	.00	.00	2.82
Architecture	.00	.00	.67	.00	.00	.00	.00	.00	.00	.00	.00
Cooking	.15	.00	.41	.00	.00	.00	.03	.00	.00	.00	.00

Table 67. Artifact densities for Early/Late period samples by landform.

Activity Group	T-1 Terrace (LTRV)	T-2 Terrace (LTRV)	>T-2 Terrace (LTRV)	L.Tenn. Valley Slope	Tellico River Valley	Tellico Valley Slope	Trib. Valley	Trib. Valley Slope	Lower Valley Uplands	Upper Valley Uplands	Dissected Knobs
Flintknapping	.72	1.70	.33	.00	.47	.00	.03	.00	.00	.00	.09
Primary Reduction	28.22	52.20	56.59	1.42	45.18	.00	2.90	25.31	.09	2.32	3.36
Bifacial Reduction	62.06	153.00	145.59	1.42	85.65	.00	2.90	28.97	.15	4.39	10.27
Bipolar Reduction	11.25	10.10	15.04	.76	19.82	.00	.59	4.41	.00	1.37	2.64
Blade Reduction	2.31	2.10	1.59	.21	3.41	.00	.21	.28	.00	.15	.09
Misc. Reduction	27.44	31.90	39.67	2.88	49.76	.00	5.79	14.17	.07	3.66	3.55
Raw Material Acquisition	.34	.20	.33	.06	1.06	.00	.10	.41	.00	.04	.00
Hunting	2.22	5.10	3.37	.15	4.59	.00	.10	.58	.01	.25	.36
Cutting	10.63	32.80	8.11	.24	11.24	.00	.45	5.07	.03	.53	.27
Heavy Butchering	.41	.40	.19	.00	.06	.00	.03	.00	.00	.00	.00
Hide Working	.28	.80	.33	.00	.59	.00	.03	.14	.00	.04	.00
Non-lithic Tool Manufacture	.69	3.00	.96	.06	1.24	.00	.03	.48	.00	.06	.00
Woodworking	.25	.10	.00	.00	.06	.00	.00	.03	.01	.01	.00
Plant Food Processing	.09	.10	.00	.00	.00	.00	.03	.00	.00	.00	.00
Fishing	1.03	1.50	.22	.00	1.41	.00	.00	.00	.00	.00	.00
Personal Adornment	.09	.20	.00	.00	.06	.00	.00	.00	.00	.00	.00
Hearth Use	344.31	734.50	106.22	.24	724.82	.00	.52	8.31	.00	.01	91.18
Architecture	.94	2.40	.00	.00	.12	.00	.00	.00	.00	.00	.18
Cooking	12.00	39.20	.30	.00	.47	.00	.00	.00	.00	.00	.00

Table 68. Summary of nearest neighbor analysis results for total sample.

Landform	Group Assigned To	Group Classified Into	Posterior Probability Valley	Upland
T-1 Terrace (LTRV)	Valley	Valley	1.00	.00
T-2 Terrace (LTRV)	Valley	Valley	1.00	.00
>T-2 Terrace (LTRV)	Valley	Valley	.67	.33
L. Tenn. Valley Slope	Upland	Upland	.00	1.00
Tellico River Valley	Valley	Valley	.67	.33
Tellico Valley Slope	Upland	Upland	.00	1.00
Tributary Valley	Upland	Upland	.00	1.00
Tributary Valley Slope	Upland	Upland	.00	1.00
Lower Valley Uplands	Upland	Upland	.00	1.00
Upper Valley Uplands	Upland	Upland	.00	1.00
Dissected Knobs	Upland	Upland	.00	1.00

Table 69. Summary of nearest neighbor analysis results for temporally identified samples.

Landform	No. of SU's	Group Assigned To	Group Classified Into	Mis-classified	Posterior Probability Valley	Posterior Probability Upland
Early Samples						
T-1 Terrace (LTRV)	2	Valley	Upland	*	.00	1.00
T-2 Terrace (LTRV)	3	Valley	Valley		1.00	.00
>T-2 Terrace (LTRV)	5	Valley	Valley		.67	.33
L. Tenn. Valley Slope	8	Upland	Upland		.00	1.00
Tellico River Valley	2	Valley	Upland	*	.00	1.00
Tellico Valley Slope	4	Upland	Valley	*	1.00	.00
Tributary Valley	6	Upland	Valley	*	.67	.33
Tributary Valley Slope	1	Upland	Upland		.00	1.00
Lower Valley Uplands	5	Upland	Upland		.00	1.00
Upper Valley Uplands	13	Upland	Upland		.00	1.00
Dissected Knobs	2	Upland	Upland		.00	1.00
Late Samples						
T-1 Terrace (LTRV)	1	Valley	Valley		1.00	.00
T-2 Terrace (LTRV)	1	Valley	Upland	*	.00	1.00
>T-2 Terrace (LTRV)	4	Valley	Valley		1.00	.00
L. Tenn. Valley Slope	0	Upland	Upland		.00	1.00
Tellico River Valley	1	Valley	Upland	*	.00	1.00
Tellico Valley Slope	0	Upland	Upland		.00	1.00
Tributary Valley	3	Upland	Upland		.00	1.00
Tributary Valley Slope	0	Upland	Upland		.00	1.00
Lower Valley Uplands	0	Upland	Upland		.00	1.00
Upper Valley Uplands	12	Upland	Upland		.33	.67
Dissected Knobs	2	Upland	Upland		.00	1.00
Early/Late Samples						
T-1 Terrace (LTRV)	24	Valley	Valley		1.00	.00
T-2 Terrace (LTRV)	4	Valley	Valley		1.00	.00
>T-2 Terrace (LTRV)	6	Valley	Valley		.67	.33
L. Tenn. Valley Slope	2	Upland	Upland		.00	1.00
Tellico River Valley	10	Valley	Valley		1.00	.00
Tellico Valley Slope	0	Upland	Upland		.00	1.00
Tributary Valley	3	Upland	Upland		.00	1.00
Tributary Valley Slope	2	Upland	Upland		.00	1.00
Lower Valley Uplands	1	Upland	Upland		.00	1.00
Upper Valley Uplands	8	Upland	Upland		.00	1.00
Dissected Knobs	1	Upland	Upland		.00	1.00

Tellico Valley Slope and Tributary Valley samples into the valley group indicates a different use of these landforms during the Early Archaic to Early Woodland periods. The presence of relatively large quantities of debitage and fire-cracked rock, together with high densities of discarded projectile points and cutting implements, suggest that these samples represent maintenance activities associated with temporary hunting camps. This pattern of artifact occurrence was similar to that observed for Early Archaic samples from the T-2 and >T-2 terraces (see Table 49).

The temporal variability displayed by the probabilistic survey sample also provided support for earlier interpretations about the nature of valley and upland land use. It was argued in Chapter III that the alluvial valleys of the Little Tennessee and Tellico rivers were best suited for both seasonal and permanent camps and villages since they were composed largely of level, well-drained land surfaces situated near permanent water sources, and offered the greatest variety of available resources. This interpretation is given further support by the preceding analyses of land use patterning. Given the continuity of this pattern over time (i.e., that similar criteria effected the placement of residential sites throughout the prehistory of the study area), we should expect a majority of artifact samples from the valley landforms to show evidence of multiple occupations. Again, our ability to recognize time is in terms of Early versus Late. A distinction between valley and upland land use should also be apparent with a majority of upland samples lacking evidence for repeated use over time. This was expected because activities

associated with resource extraction (primarily hunting) would have been less restricted by site-specific environmental requirements.

An examination of temporally identified artifact samples by landform group, evaluated statistically using a Chi-square test of association, indicated a significant non-random association (Table 70). Specifically, a disproportionately large number of valley landforms contained both Early and Late artifacts, whereas most upland samples represented only a single time period. In addition, substantially more upland samples contained Early material (recognized primarily by projectile points), which suggests that either upland resource extraction activities were more prevalent during the Archaic and Early Woodland periods, or perhaps a differential upland discard pattern for projectile points associated with a shift from the atlatl (Early) to the bow-and-arrow (Late).

SUMMARY

The primary purpose of the land-use study has been to use a "non-site" perspective in order to draw general inferences about the manner in which prehistoric activities were spatially structured within the study area. As a result of this study, several concluding observations can be made. Although most findings were not entirely unexpected, they are significant in that they provide strong empirical support for many heretofore untested notions about the spatial structuring of the archaeological record at the regional level and about the nature of aboriginal land use.

First, a clear dichotomy between valley and upland land use was

Table 70. Chi-square test comparing time period occurrence and landform group.

Landform Group	Time Period: Early o_i	Early e_i	Late o_i	Late e_i	Early/Late o_i	Early/Late e_i	Total
Upland	39	27.4	17	12.9	17	32.7	73
Valley	12	23.6	7	11.1	44	28.3	63
Total	51		24		61		136

$X^2=29.68$, df=2, $p<.001$

shown to exist within the study area. This dichotomy was manifested by variability in both artifact density and content, and is best explained in terms of site maintenance versus resource extraction activities. Whereas the collections from valley landforms displayed a range of functionally interpretable artifacts associated with residential site use, upland samples consisted of a more limited range of artifacts that were probably associated largely with hunting activities.

Second, there does not appear to be any significant change in this basic pattern over time. Temporally related differences that do exist apparently relate to more intensive exploitation of the uplands during the Early Archaic through Early Woodland periods, made possible by logistically organized procurement strategies involving temporary hunting camps along major tributaries and possibly also along Tellico River and on older alluvial terraces of the Little Tennessee River. In addition, the intensity of residential activities along the valley landforms in general, and specifically on the T-2 terrace, increased significantly during the Mississippian period.

Finally, the land use study identified three attributes of residential sites within the study area that can be used to help identify such sites for subsequent analyses of residential site patterning. These attributes are: 1) moderately high artifact density indicative of concentrated and prolonged maintenance-related activities; 2) the presence of artifacts that can be regarded as site furniture or maintenance items, including fire-cracked rock; and 3) evidence for multiple occupations. Although this last attribute is

insufficient alone for recognizing residential sites, it was found that most artifact samples that could be interpreted to reflect residential activities contained evidence of multiple components. This conclusion is also supported by previous analyses of the survey data (Davis 1982, 1985).

CHAPTER VII

ANALYSIS OF SITE PATTERNS

The settlement analysis discussed in the preceding chapter focused upon archaeological patterns that reflect the general manner in which aboriginal activity within the lower Little Tennessee River valley was spatially structured. Using data derived from probabilistic regional survey, it was argued that predominant land uses within valley and upland environments were fundamentally different throughout prehistory and could be modeled as a site maintenance-resource extraction dichotomy.

In this chapter, emphasis shifts from broad regional land use patterns to temporally specific settlement patterns. The database used in this study is correspondingly expanded to include all archaeological survey data available for the Tellico survey area. This was necessary because of the limited number of probabilistic sampling units that were surveyed along the lower Little Tennessee River prior to reservoir inundation. In all, 624 aboriginal sites were recorded between 1967 and 1982; 337 (54%) contained artifacts that permitted the identification of one or more cultural components. Many of these latter sites showed evidence of multiple occupations. A summary of the cultural components identified by the site sample is provided in Table 71.

The goal of the analysis discussed below was to compile as completely as possible the extant archaeological survey data for the lower Little Tennessee River valley in order to: 1) summarize

Table 71. Summary of cultural components identified within the study area.

Time Period	Cultural Phase	No. of Sites	%
Paleo-Indian			
	(Clovis)	7	0.78
Early Archaic			
	(Dalton)	15	1.68
	Lower Kirk	55	6.15
	Upper Kirk	101	11.30
	St. Albans	31	3.47
	LeCroy	23	2.57
	Kanawha	17	1.90
Middle Archaic			
	Kirk Stemmed/Stanly	64	7.16
	Morrow Mountain	72	8.05
	(Guilford)	12	1.34
	(Sykes)	51	5.70
Late Archaic			
	Savannah River	22	2.46
	Iddins	102	11.41
Early Woodland			
	Watts Bar	54	6.04
Middle Woodland			
	Patrick	62	6.94
	Icehouse Bottom	87	9.73
Early Mississippian			
	Martin Farm	17	1.90
	Hiwassee Island	42	4.70
Late Mississippian			
	Dallas	27	3.02
Historic			
	Overhill	33	3.69
Total		894	99.99

settlement patterns for each of the 21 recognized temporal units (e.g., cultural phases); and 2) to evaluate diachronic patterns of settlement stability and change during the course of aboriginal occupation within the region. Because the site sample represents the cumulative result of 15 years of survey, testing, and excavation by several different investigators, the quality and amount of information about these sites is highly variable. Consequently, only a moderately low-level analysis of site patterning was possible. Furthermore, it must be assumed that the cumulative archaeological record for the study area is sufficiently representative and not substantially biased in ways that obscure the true patterns of aboriginal settlement. Some potential sources of sample bias are more fully considered below.

METHOD OF ANALYSIS

Initially, site data were gathered from available published and unpublished sources in order to construct a site inventory for the study area. Specific information recorded for each site included primary site designation, other site designations, map location, and bibliographic references.

Kimball's (1985) assessment of the archaeological resources of Tellico Reservoir provided a systematic and thorough treatment of the 266 aboriginal sites recorded between 1967 and 1977, including an evaluation of archaeological sites investigated during the late 19th and early 20th centuries (e.g., Thomas 1894; Harrington 1922). His study, which reanalyzed previously collected artifact samples in addition to identifying 129 new archaeological resources within the

proposed impoundment zone, greatly facilitated the present settlement research by organizing a massive amount of site data and by laying the groundwork for subsequent probabilistic archaeological surveys within the Tellico project area.

Between 1979 and 1982, 359 additional sites were recorded during surveys conducted both within the valley area now covered by Tellico Lake and on valley and upland landforms adjacent to the lake. Two hundred nineteen new sites were recorded by the probabilistic survey. The remaining 140 sites were recorded by purposive surveys directed toward assessing the impacts of proposed industrial, residential, and recreational developments within the uplands. The results of these investigations were reported by Davis (1980b) and Davis et al. (1982).

Following construction of the site inventory, site patterns were delineated for each cultural phase. This involved examining artifact inventories for each site and identifying those artifacts which were diagnostic temporal indicators. In addition to the use of certain artifacts for recognizing cultural components, some buried components along the first terrace of the Little Tennessee River, lacking artifactual data, were identified through regression analysis (see Chapter V).

Using artifact density data and other field observations (when available), sites of each cultural phase were then functionally classified according to settlement typologies proposed in Chapter II. Specifically, frequencies of diagnostic artifact classes (primarily projectile point and pottery types) were computed for each site and, after taking into consideration the method(s) of artifact recovery

(e.g., survey, limited testing, major excavation), a decision was made about the likely functional interpretation of that particular cultural component. When possible, other observations about the presence and density of archaeological features were included in this decision-making process.

Since most sites were comprised of archaeological remains representing multiple occupations, other site variables such as size and density of non-diagnostic artifacts (e.g., debitage, most lithic tool classes, and fire-cracked rock) usually were not considered except for those sites that were sampled by major excavations. Although knowledge about the size and overall artifact composition of a cultural component would have been extremely helpful in functional interpretation, such measures are often likely to reflect either the single largest component at a site or the aggregated effect of several components.

A settlement pattern is defined by the spatial-environmental distribution of functionally distinct but interrelated sites representing a cultural phase. Using locational information generated for the overall site inventory, functional site interpretations, and generalizations about aboriginal land use resulting from analysis of the probabilistic survey data, settlement patterns were evaluated for each cultural phase recognized within the study area. These patterns were then examined collectively to ascertain in what ways they changed over time.

SAMPLE BIASES

Before proceeding with a discussion of individual settlement patterns, it was first necessary to consider some potential sources of sample bias that might effect the interpretation of these patterns and the nature and degree of settlement change over time. Recognizable biases in the overall site sample can be placed into three categories--spatial, temporal, and functional.

Kimball (1985:320-323), following his analysis of site data collected through 1977, concluded that these data were severely biased by selectivity in the location of archaeological surveys. Specifically, he noted that most landforms other than the first and second terraces of the Little Tennessee River had never been systematically examined and thus were poorly represented in the site inventory. Subsequent surveys, being largely probabilistic in design and encompassing the entire survey area, have helped to correct this situation.

In order to assess the degree of spatial bias that still remained, the landform distribution of sites comprising the overall site inventory (n=624) was compared with an expected distribution generated by the probabilistic survey data (Table 72). Distribution differences were evaluated by a Chi-square goodness of fit test. This test indicated significant sample bias (X^2=130.75, df=8, $p<.001$) caused by a severe under-representation of sites from the older (>T-2) alluvial terraces and a corresponding over-representation of upland sites. All other landform categories were represented by an expected number of sites. Given these results, two precautions are in order. First and most serious, estimates about site densities on old alluvial

Table 72. Actual and expected landform distributions for archaeological sites recorded within the Tellico study area.

Landform	Total Site Inventory n	%	Expected Distribution[1] n	%
T-1 Terrace	130	20.8	137.3	22.0
T-2 Terrace	28	4.5	18.7	3.0
>T-2 Terrace	51	8.2	162.2	26.0
LTRV Slope	47	7.5	43.7	7.0
Tellico Valley	50	8.0	37.4	6.0
Tellico Slope	18	2.9	18.7	3.0
Tributary Valley	37	5.9	25.0	4.0
Tributary Slope	43	6.9	25.0	4.0
Upland	220	35.3	156.0	25.0
Total	624	100.0	624.0	100.0

$X^2=130.75$, df=8, $p<.001$

[1]Based upon probabilistic survey data.

terraces are likely to be artificially low (i.e., approximately 32% of their expected value) and may seriously effect perceived patterns of residential site location. Second, upland site density estimates are likely to be exaggerated (i.e., approximately 141% of their expected value). This latter condition is not nearly as serious since most of these sites represent extractive activities and usually cannot be attributed to a specific phase. Consequently, interpretations about these sites rely primarily upon analyses (presented earlier) of probabilistic survey data.

Temporal biases in the overall site sample were also anticipated as a result of two factors. First, it can be demonstrated that the probability of identifying a cultural component based on the presence of temporally diagnostic artifacts varies significantly between phases, particularly for the Woodland and Mississippian periods. Whereas the percentage of diagnostic sherd types comprising Woodland sherd assemblages was high (i.e., Watts Bar - 41.8%; Patrick - 85.2%; Icehouse Bottom - 35.5%), corresponding percentages for Mississippian assemblages were generally lower (i.e., Martin Farm - 41.8%; Hiwassee Island - 6.4%; Dallas - 22.0%; Overhill - 42.6%). The majority of sherds within Mississippian assemblages were usually non-diagnostic and consisted of either Shell-Tempered Plain or Shell-Tempered Cordmarked. Although it was suspected that the rates of projectile point manufacture, use, and discard were probably relatively similar throughout the Archaic period and thus suggest an equal probability of cultural component identification among Archaic phases, Iddins phase components had a higher probability of detection due to the presence

of soapstone vessel fragments. Lastly, the difference in probability of recognizing cultural components based upon projectile points versus potsherds, while undefined, is probably substantial. Because of these sources of temporal bias, questions about the degree and pattern of settlement change between cultural phases, especially following the Late Archaic period, were approached cautiously.

A final source of potential bias in the site sample can be termed functional bias. This involves the ability to functionally differentiate between sites comprising a site pattern and the degree to which the resultant frequency distribution of site types deviates from the true distribution. Although this type of potential bias could not be explicitly evaluated, its effects are probably substantial for most cultural phases, particularly with respect to the recognition of logistical sites and activity loci. Specifically, while large residential sites usually had high archaeological "visibility" and contained sufficient evidence for recognizing individual cultural components, most smaller sites representing either isolated domiciles or resource extraction activities lacked such evidence for phase classification and therefore were excluded from subsequent settlement pattern definitions. This problem was especially acute for the Mississippian period where temporally diagnostic artifacts (i.e., pottery) automatically identified a residential site type. For this period, logistical camps, activity loci, and even many small residential sites could only be regarded as "general Mississippian." The substantial problem of recognizing cultural components at small sites is reflected by the fact that artifact assemblages from 46% of the

sites inventoried within the study area lacked temporally diagnostic material. As with other sources of sample bias discussed above, these factors necessitated a cautious and fairly generalized approach to interpreting the settlement patterns extracted from the site sample.

SITE DISTRIBUTIONS

In this section, settlement patterns are summarized for each of the 21 temporal units. Specific site data used to define these patterns are presented in Appendices 4-6.

Paleo-Indian Period

The Paleo-Indian period (11,000-8,500 B.C. ?) was poorly represented within the Tellico site sample. Isolated Clovis points were recovered from only six sites. An additional projectile point was reported from another site by a local collector (Figure 39). With one exception, all of these specimens were recovered during archaeological excavations. None was associated with other materials that could be attributed to the Paleo-Indian period; instead, they occurred with later materials and (at 40LD35 and 40MR23) in more recent stratigraphic contexts. The lack of Paleo-Indian remains along the first terrace of the Little Tennessee River was not unexpected given the comparatively recent dates that have been obtained for basal terrace sediments; however, the almost complete absence of such remains on older alluvial terraces and within the uplands can only be interpreted as a reflection of sporadic utilization of the valley area during the Paleo-Indian period (Table 73).

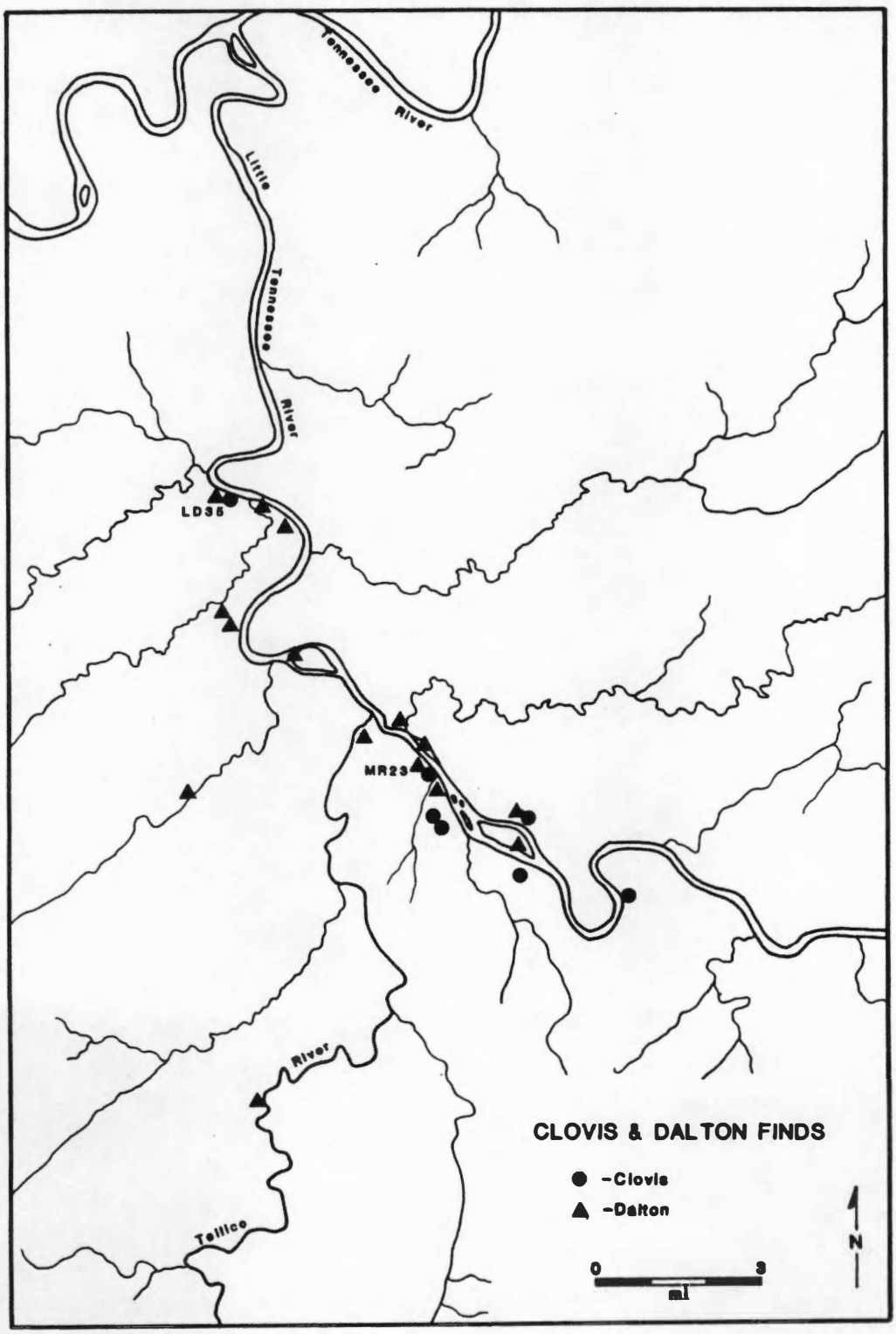


Figure 39. Location of Clovis and Dalton projectile point finds.

Table 73. Distribution of sites producing Clovis and Dalton projectile points.

Landform	Clovis n	Clovis %	Dalton n	Dalton %
T-1 Terrace	2	28.6	6	40.0
T-2 Terrace	4	57.1	1	6.7
>T-2 Terrace	0	0	1	6.7
LTRV Slope	0	0	1	6.7
Tellico Valley	0	0	1	6.7
Tellico Slope	0	0	1	6.7
Tributary Valley	0	0	1	6.7
Tributary Slope	0	0	1	6.7
Upland	1	14.3	2	13.3
Total	7	100.0	15	100.2

Early Archaic Period

Three hundred six Early Archaic period (8,000-6,000 B.C.) cultural components were identified in the study area. Approximately 12% (n=37) were buried archaeological strata lacking any evidence for artifact assemblages or cultural features and, consequently, were excluded from functional site classification (and mapping). The remainder were classified as either base camps, logistical camps, or activity loci based upon projectile point density and feature evidence (when available). General classification criteria for sites identified by surface survey and limited backhoe testing were as follows: Base Camp (>5 projectile points recovered or archaeological features observed); Logistical Camp (2-5 projectile points recovered); and Activity Locus (1 projectile point recovered). Components identified and sampled by more extensive excavation were evaluated individually using the entire range of archaeological data recovered. The locations of components representing each Early Archaic cultural phase, by site type, are mapped in Figures 39-44. Site type distributions by landform are summarized in Tables 73-78.

Dalton. Dalton projectile points were recovered from 14 sites. Another was observed within a private collection from an upland site within the study area. In each instance, these projectile points occurred as isolated finds within artifact collections containing evidence for other cultural components. Although several (n=6) were recovered from deeply buried strata at sites along the first terrace of the Little Tennessee River, Dalton projectile points were also collected from sites representing all other major valley and and

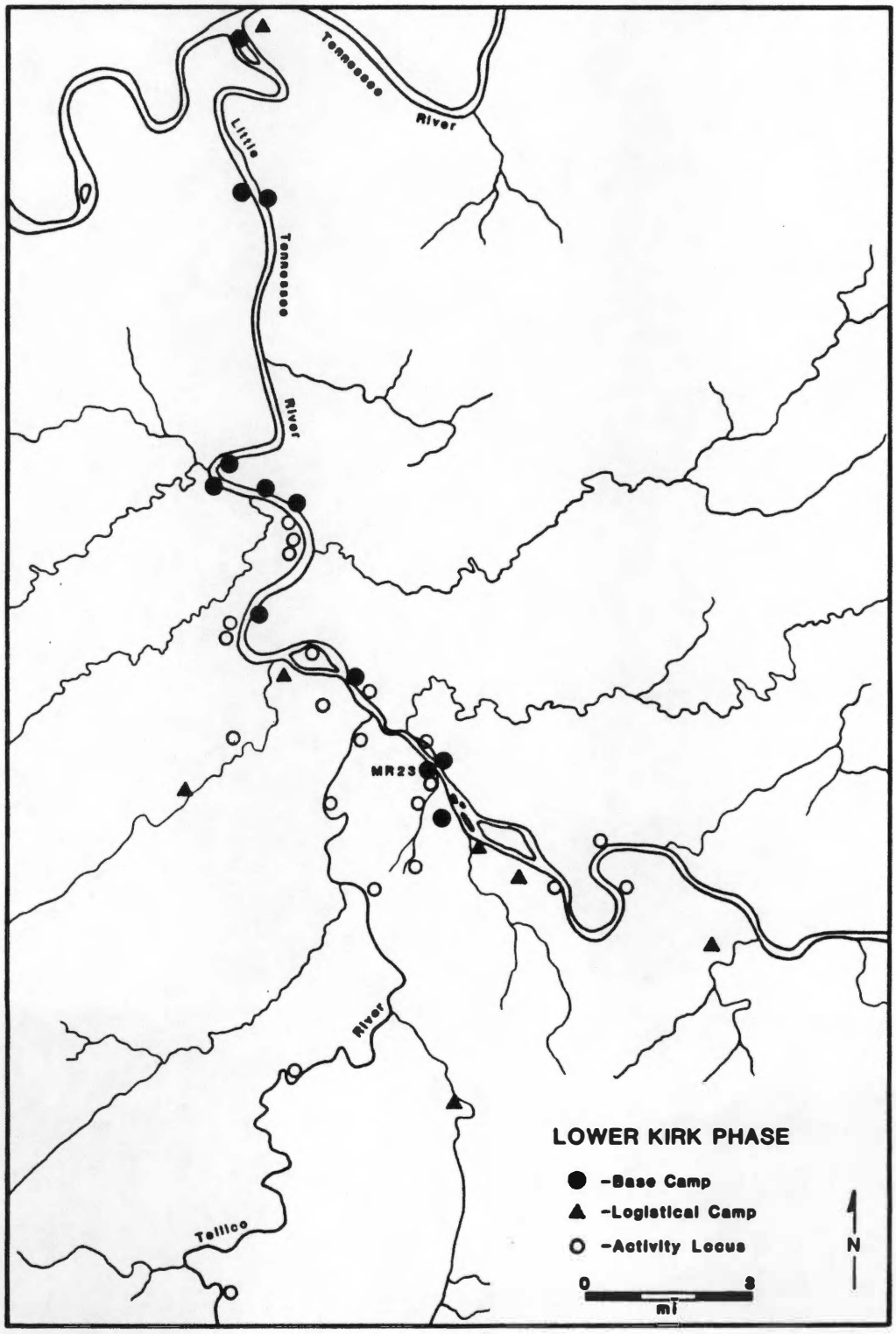


Figure 40. Location of Lower Kirk phase sites.

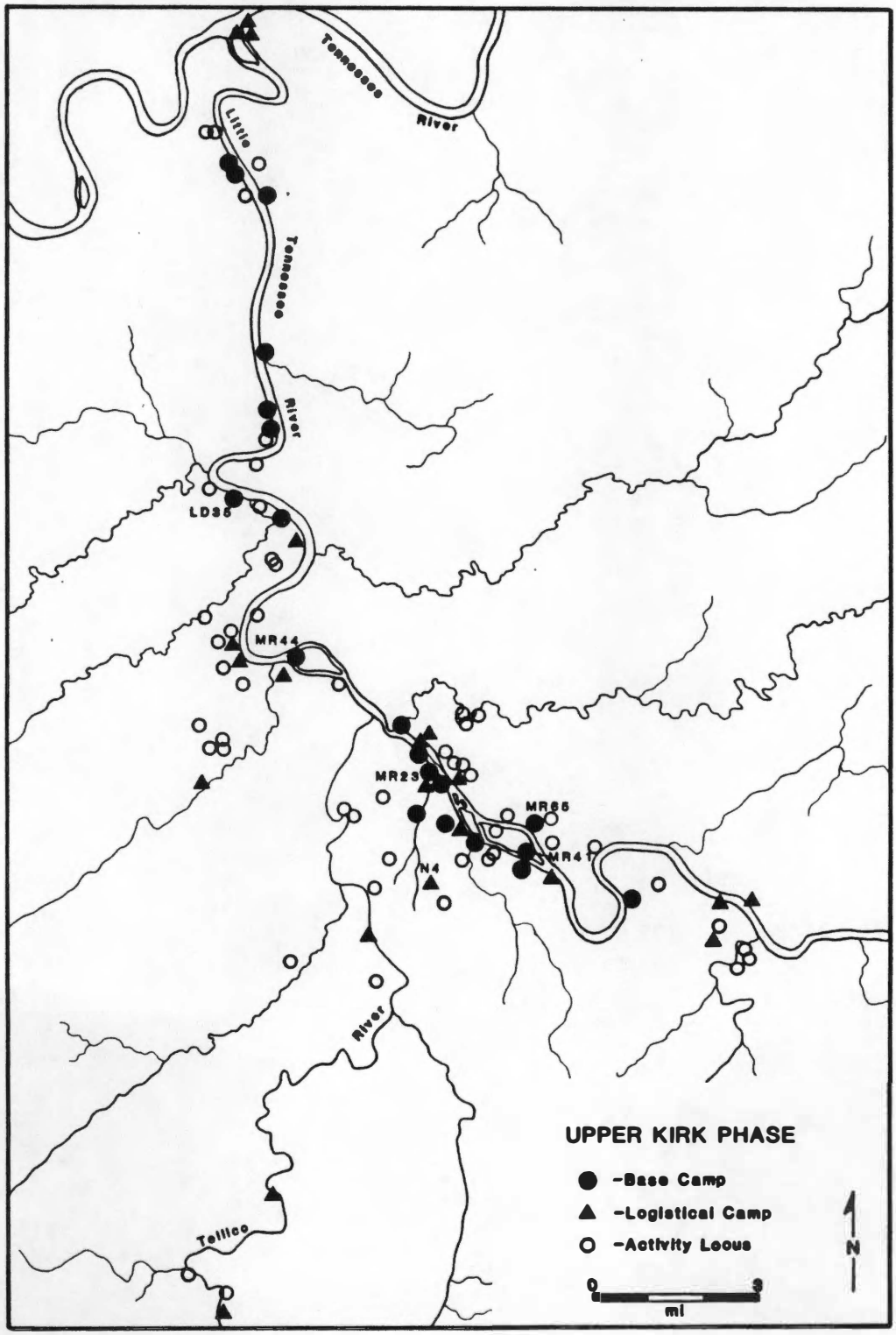


Figure 41. Location of Upper Kirk phase sites.

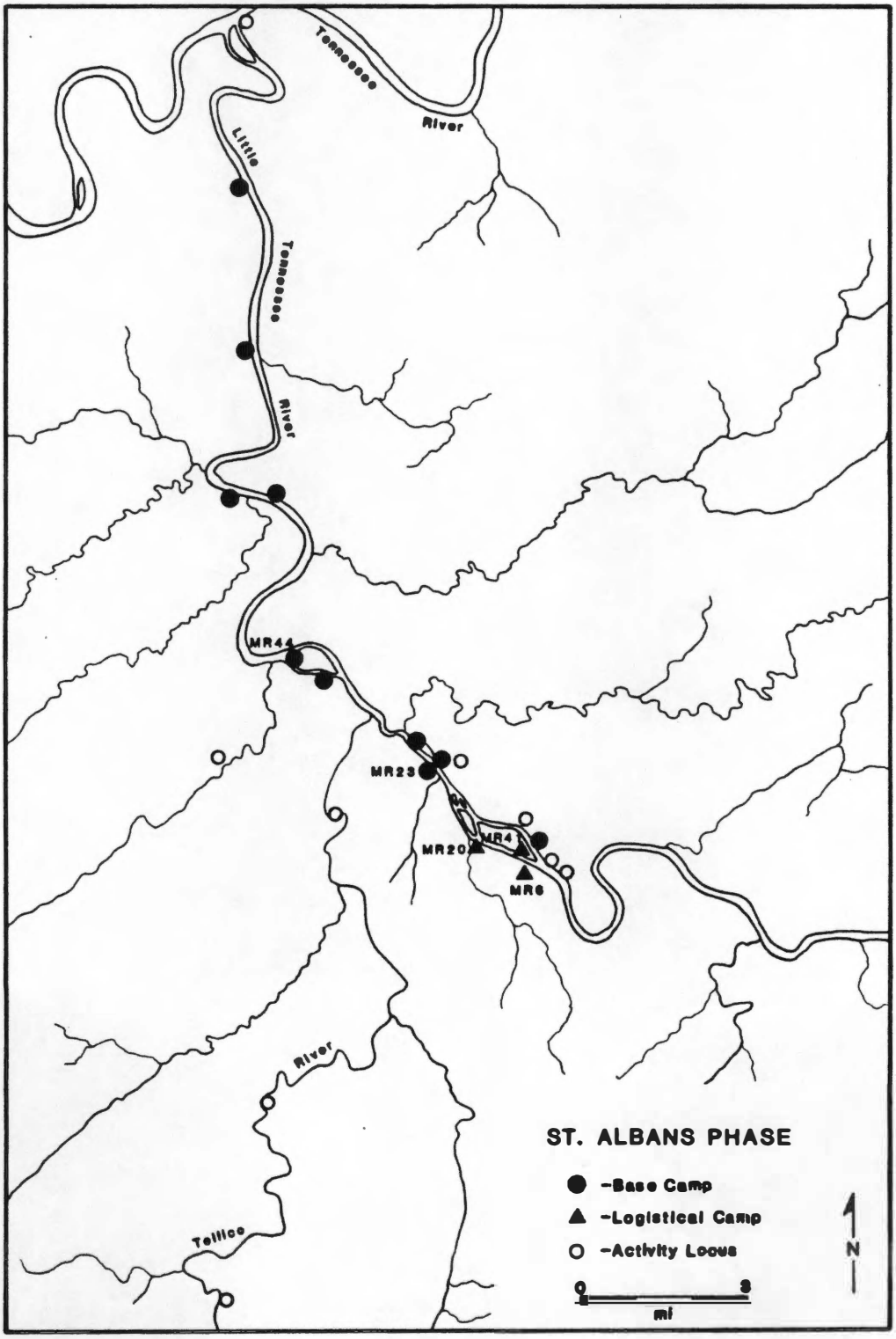


Figure 42. Location of St. Albans phase sites.

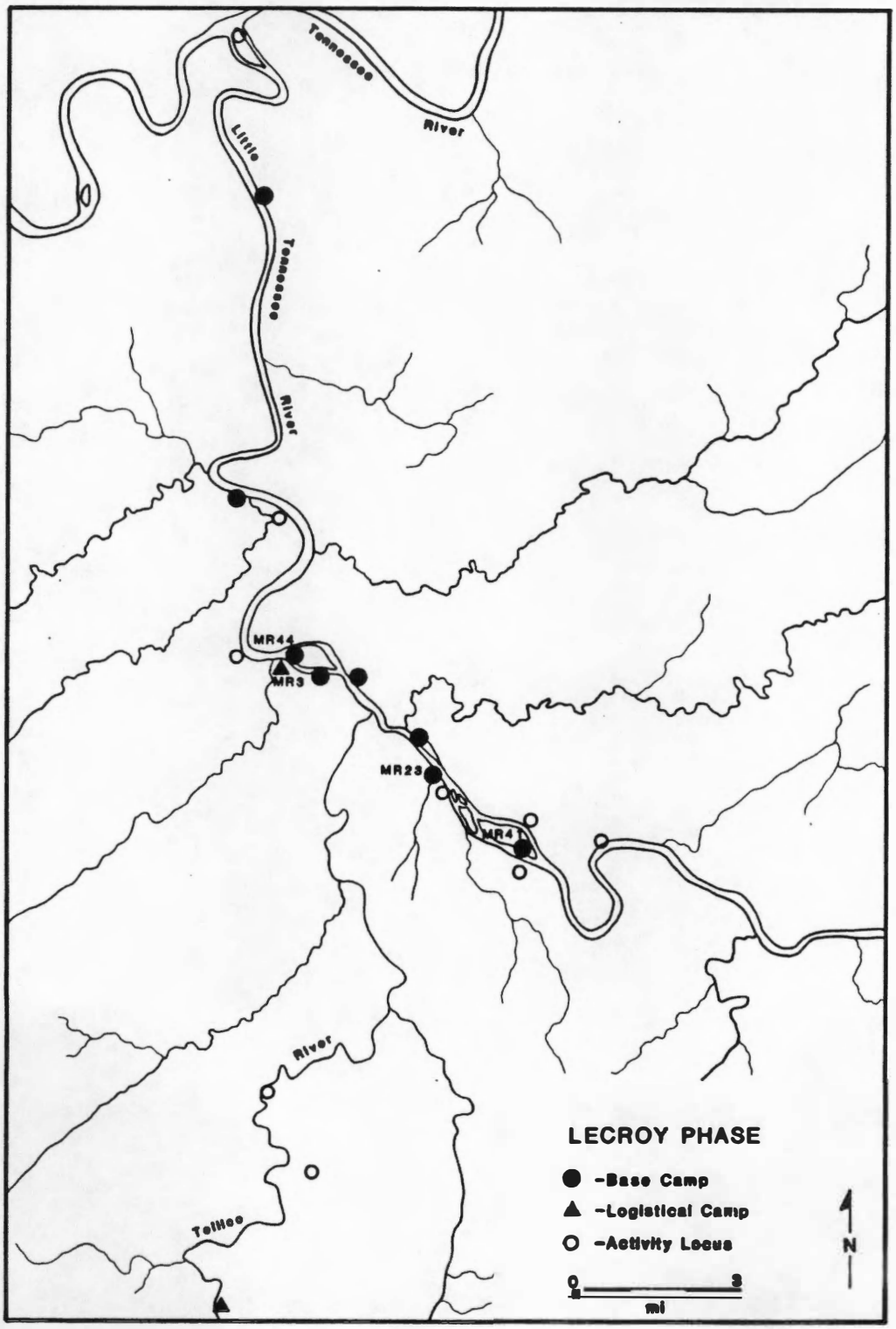


Figure 43. Location of LeCroy phase sites.

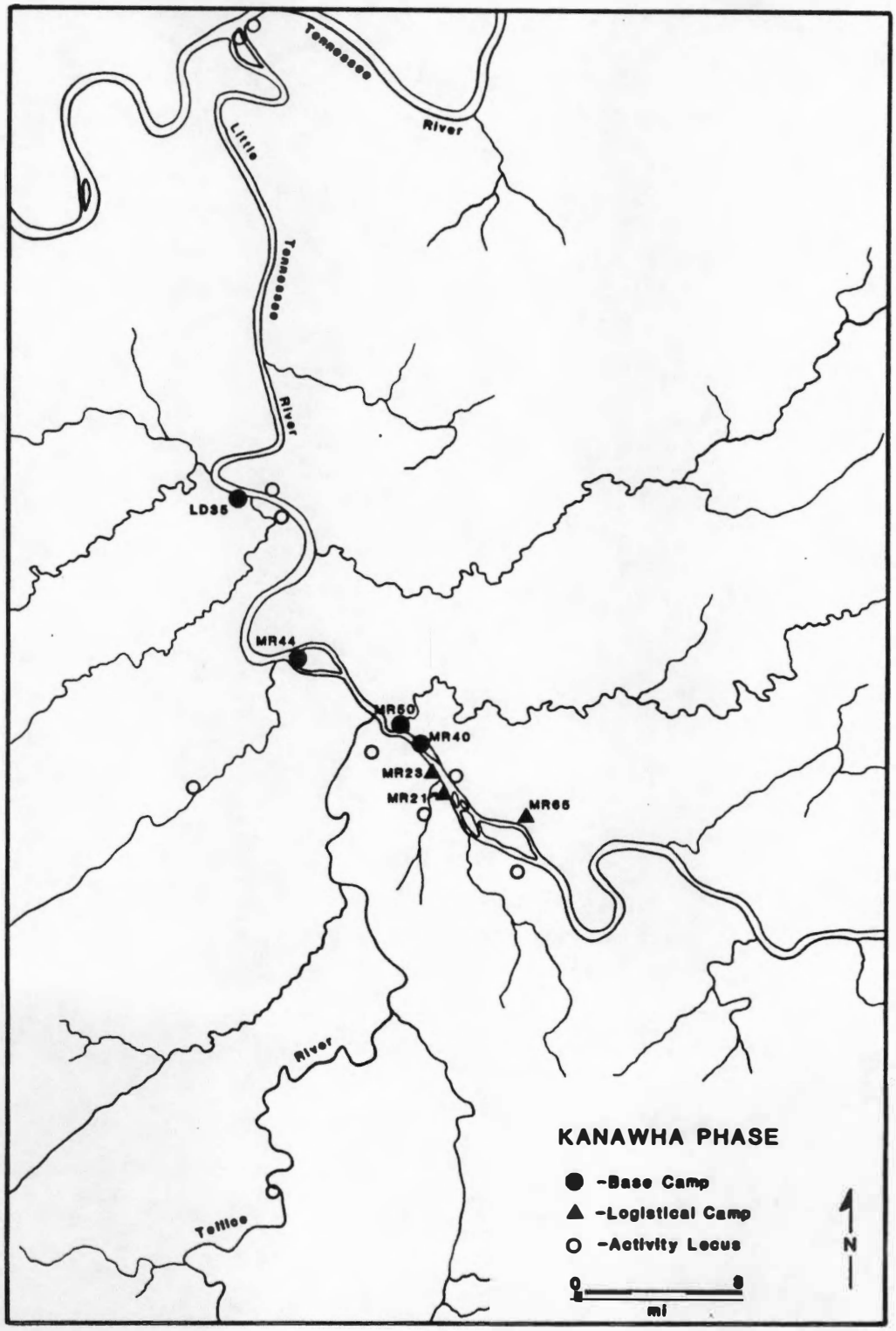


Figure 44. Location of Kanawha phase sites.

Table 74. Distribution of Lower Kirk phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	11	91.7	1	14.2	4	19.0	15	100.0	31	56.4
T-2 Terrace	1	8.3	2	28.6	2	9.5	0	0.0	5	9.1
>T-2 Terrace	0	0.0	2	28.6	4	19.0	0	0.0	6	10.9
LTRV Slope	0	0.0	0	0.0	1	4.8	0	0.0	1	1.8
Tellico Valley	0	0.0	0	0.0	4	19.0	0	0.0	4	7.3
Tellico Slope	0	0.0	0	0.0	1	4.8	0	0.0	1	1.8
Tributary Valley	0	0.0	2	28.6	0	0.0	0	0.0	2	3.6
Tributary Slope	0	0.0	0	0.0	1	4.8	0	0.0	1	1.8
Upland	0	0.0	0	0.0	4	19.0	0	0.0	4	7.3
Total	12	100.0	7	100.0	21	99.9	15	100.0	55	100.0

Site Types: A - Base Camp
B - Logistical Camp
C - Activity Locus
D - Indeterminate Type

Table 75. Distribution of Upper Kirk phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	13	65.0	6	28.6	8	15.7	9	100.0	36	35.6
T-2 Terrace	3	15.0	3	14.3	7	13.7	0	0.0	13	12.9
>T-2 Terrace	2	10.0	5	23.8	6	11.7	0	0.0	13	12.9
LTRV Slope	1	5.0	0	0.0	2	3.9	0	0.0	3	3.0
Tellico Valley	0	0.0	3	14.3	3	5.9	0	0.0	6	5.9
Tellico Slope	0	0.0	0	0.0	1	2.0	0	0.0	1	1.0
Tributary Valley	0	0.0	1	4.7	3	5.9	0	0.0	4	3.9
Tributary Slope	0	0.0	0	0.0	3	5.9	0	0.0	3	3.0
Upland	1	5.0	3	14.3	18	35.3	0	0.0	22	21.8
Total	20	100.0	21	100.0	51	100.0	9	100.0	101	100.0

Site Types: A - Base Camp
B - Logistical Camp
C - Activity Locus
D - Indeterminate Type

Table 76. Distribution of St. Albans phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	10	100.0	2	66.7	3	33.3	9	100.0	24	77.5
T-2 Terrace	0	0.0	1	33.3	0	0.0	0	0.0	1	3.2
>T-2 Terrace	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
LTRV Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tellico Valley	0	0.0	0	0.0	3	33.3	0	0.0	3	9.7
Tellico Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Valley	0	0.0	0	0.0	1	11.1	0	0.0	1	3.2
Tributary Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Upland	0	0.0	0	0.0	2	22.2	0	0.0	2	6.4
Total	10	100.0	3	100.0	9	99.9	9	100.0	31	100.0

Site Types: A - Base Camp
B - Logistical Camp
C - Activity Locus
D - Indeterminate Type

Table 77. Distribution of LeCroy phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	8	100.0	0	0.0	3	33.3	4	100.0	15	65.2
T-2 Terrace	0	0.0	1	50.0	1	11.1	0	0.0	2	8.7
>T-2 Terrace	0	0.0	0	0.0	1	11.1	0	0.0	1	4.3
LTRV Slope	0	0.0	0	0.0	1	11.1	0	0.0	1	4.3
Tellico Valley	0	0.0	1	50.0	1	11.1	0	0.0	2	8.7
Tellico Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Valley	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Upland	0	0.0	0	0.0	2	22.2	0	0.0	2	8.7
Total	8	100.0	2	100.0	9	99.9	4	100.0	23	99.9

Site Types: A - Base Camp
B - Logistical Camp
C - Activity Locus
D - Indeterminate Type

Table 78. Distribution of Kanawha phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	3	75.0	2	66.7	2	20.0	0	-	7	41.2
T-2 Terrace	0	0.0	0	0.0	2	20.0	0	-	2	11.7
>T-2 Terrace	1	25.0	0	0.0	2	20.0	0	-	3	17.6
LTRV Slope	0	0.0	0	0.0	1	10.0	0	-	1	5.9
Tellico Valley	0	0.0	0	0.0	1	10.0	0	-	1	5.9
Tellico Slope	0	0.0	0	0.0	0	0.0	0	-	0	0.0
Tributary Valley	0	0.0	0	0.0	1	0.0	0	-	1	5.9
Tributary Slope	0	0.0	0	0.0	0	0.0	0	-	0	0.0
Upland	0	0.0	1	33.3	1	10.0	0	-	2	11.7
Total	4	100.0	3	100.0	10	100.0	0	-	17	99.9

Site Types: A - Base Camp
B - Logistical Camp
C - Activity Locus
D - Indeterminate Type

upland landform classes. Since all points from first terrace sites occurred within later stratigraphic contexts, they were of questionable value in characterizing the Dalton settlement pattern as it pertains to this landform. The even, yet sparse, distribution of Dalton points throughout the remainder of the study area, particularly when compared with site distributions of later Early Archaic phases, indicates only limited and sporadic use of the valley area by Dalton peoples. It is likely that this distribution of artifacts is largely representative of small temporary hunting camps associated with larger base camps possibly positioned along the Tennessee River.

Lower Kirk Phase. Lower Kirk phase components were identified at 55 sites within the study area and were recorded for all major landform classes (Table 74). Forty of these sites contained archaeological evidence that permitted interpretation of site function. With a single exception, all Lower Kirk components were sampled solely by limited backhoe testing or surface collecting. Most were located along or adjacent to the Little Tennessee River valley between Upper Jackson Bend and Bacon Bend (Figure 40).

Twelve probable base camps were identified in the sample. Eleven of these contained evidence of archaeological features; the other was identified by a moderately high density of projectile points. This was also the only Lower Kirk base camp that was not situated on the first terrace of the Little Tennessee River. At the Icehouse Bottom site (40MR23), approximately 1,630 ft^2 of the deeply buried Lower Kirk zone (Strata M-O) was sampled through excavation and provided the best evidence for a Lower Kirk base camp (Chapman 1977). The 82

archaeological features excavated from this zone included both prepared and unprepared clay hearths, rock hearths, small pits, and basins. No architectural remains were observed, suggesting only light shelter construction. In addition to moderate amounts of debitage, the lithic assemblage contained discarded projectile points, end scrapers, flake knives, pièces esquillées, and other ad hoc flake implements. Modified cobble tools representing site furniture included hammerstones, pitted cobbles or anvil stones, a mano, and two milling stones. Charred acorns and hickory nut fragments dominated the sample of paleoethnobotanical remains from the site. This assemblage of artifacts and features indicates a range of maintenance activities including the manufacture and use of stone tools and the processing of foodstuffs. The evidence for hearth preparation and the construction of pits suggests that the inhabitants actively modified the site to suit their needs. This pattern is repeated at base camp sites of all subsequent cultural phases. The repetition of these activities over time, indicated by the stratigraphically successive remains of the Lower Kirk component, further suggests that the Icehouse Bottom site continued to be a preferred habitation place. Whether or not this characteristic is generally typical of Lower Kirk base camps is uncertain. The location of this site immediately adjacent to an abundant source of Knox Black Chert probably enhanced its desirability as a place of residence.

Seven Lower Kirk components were classified as probable logistical camps. These sites were situated on first, second, and older alluvial terraces, and along Ballplay Creek and Island Creek. In the

absence of more complete artifact assemblage information, specific interpretations of site function is not possible; however, all probably represent temporary hunting camps. Low artifact densities suggest that these sites were only used on an intermittent basis.

The majority (n=21) of the functionally identified Lower Kirk components were classified as activity loci, and consisted of isolated projectile point finds. Activity loci were identified within all landform classes except for Tributary Valleys and probably represent ephemeral hunting activities. This is particularly likely at those sites which were situated away from available water sources. Because of low artifact densities, both logistical camps and activity loci are almost certainly greatly under-represented in the site sample.

Upper Kirk Phase. The Upper Kirk phase was well represented in the Tellico site sample. One hundred one components were identified. Of these, only nine were excluded from functional classification. Upper Kirk phase sites were recorded on all major landforms (Table 75) and were distributed along the entire length of the Little Tennessee River valley from Bussell Island to Citico Creek (Figure 41). Sites of all functional types were particularly concentrated between the mouth of Ninemile Creek and the upper end of Calloway Island. While this concentration is due in part to a greater focus of archaeological research in this locality, it is significant that this area was also the most expansive and ecologically diverse section of the Little Tennessee River valley and lay at the junction of the rolling Upper Valley Uplands and the considerably more rugged Dissected Knobs.

Twenty Upper Kirk sites were identified as probable base camps.

Twelve of these, including four sites (Bacon Farm - 40LD35), Icehouse Bottom - 40MR23, Calloway Island - 40MR41, and Rose Island - 40MR44) that were sampled through excavation, contained evidence of archaeological features. The remainder were classified on the basis of high projectile point densities. With one exception, all were located along the Little Tennessee River valley. A single upland site (40MR65) was situated at the edge of the valley overlooking Calloway Island.

Archaeological evidence from the four excavated components indicates artifact assemblage and feature patterns similar to those described for the Lower Kirk component at Icehouse Bottom (Chapman 1975, 1977, 1978, 1979). Tool assemblages included discarded projectile points, end scrapers, knives, pièces esquillées, and other flake tools suggesting a variety of maintenance-related activities. Items classified as site furniture, such as milling stones, hammerstones, pitted cobbles, and chopper/scrapers, were also recovered. Features from these sites included prepared and unprepared hearths, globular pits, basins, fired areas, and surface concentrations of rock. In addition, a single human cremation within a shallow, basin-like pit was excavated from the Upper Kirk zone at Icehouse Bottom (Chapman 1977:112-113), indicating that mortuary activities and associated rituals also occurred at these sites.

Substantial variability in artifact and feature density are apparent among the Upper Kirk base camps. This was also recognized for other Archaic phases. While it is possible that some sites experienced greater and more intensive use by aggregated "macro-bands"

and thus are functionally unique, the interpretation favored here is that the more dense archaeological manifestations at sites such as Icehouse Bottom and Bacon Farm are simply due to a higher degree of use through repeated occupations. In this sense, such sites can certainly be regarded as favored or preferred locations. It is equally possible, and in fact likely, that at least some of this variability is a result of sampling bias caused by the limited site areas sampled by backhoe testing and buried site excavation.

Twenty-one Upper Kirk components were classified as logistical camps. Although a majority (67%) of these were also situated within the Little Tennessee River valley, several were also identified along Tellico River, along Island Creek, and within the uplands immediately adjacent to the Little Tennessee River valley. Placement of logistical camps within the Little Tennessee River valley also indicates a preference for camp locations away from the river and toward the back edge of the valley.

One of these sites (Site N4), situated near the front edge of a T-5 terrace remnant, was investigated by controlled plowing, surface collecting, and mechanical stripping of plowed soil from an area approximately one acre in size as part of a proposed recreation facility assessment (Davis et al. 1982:556-559). A majority (n=4) of projectile points collected were classified as Upper Kirk and were spatially associated with a moderate amount of debitage, end scrapers, a limited range of other flake tools, and fire-cracked rock scattered over the site surface. Most of these artifacts are probably associated with this occupation. Despite the numerous artifacts found on

the surface, subsequent stripping of plowzone (approximately 1.0 ft thick) using a self-loading pan with a toothless blade failed to expose any intact archaeological features. Although natural and artifacial post-depositional processes (e.g., soil erosion and agricultural plowing) may account for the lack of features intruding subsoil, it is also possible that the predominant type of constructed facilities used at the site were surface hearths. If so, then all such facilities would have been either lost to erosion or quickly eradicated by even shallow surface disturbances. Given the anticipated function of most logistical camps as short-term hunting encampments, more substantial kinds of archaeological features would not be expected.

Finally, approximately half (n=51) of all Upper Kirk sites were classified as limited activity loci. These sites were defined by the isolated occurrence of Upper Kirk (and Decatur) projectile points and were distributed across all landforms. Such sites were particularly abundant within the uplands and often occurred in association with low-density scatters of debitage. This paucity of artifactual remains suggests only limited site use. Given the general absence of other tool types at these sites, most are thought to reflect ephemeral hunting activities.

St. Albans Phase. In contrast to the two Kirk phases, comparatively few St. Albans, LeCroy, and Kanawha phase sites were identified in the study area. Only 31 St. Albans sites were recorded, nine of which were deeply buried sites lacking artifact samples (Table 76). Most St. Albans sites were situated on the first terrace of the

Little Tennessee River from Bacon Bend to Bussell Island (Figure 42). Half of all functionally classified components were located between the upper end of Calloway Island and the mouth of Ninemile Creek, a pattern also observed for the Upper Kirk phase.

All 10 St. Albans phase components classified as probable base camps were deeply buried along the first terrace of the Little Tennessee River and exhibited evidence of archaeological features. Two of these components, identified at the Icehouse Bottom (40MR23) and Rose Island (40MR44) sites; were well sampled by archaeological excavation (Chapman 1975, 1977). The Rose Island component (Stratum VIIC) has also been the subject of a detailed study of intrasite structure (Kimball 1981). The following characterization of a St. Albans base camp is based on Kimball's study.

The 1,400 ft^2 excavation area examined by Kimball (1981:57) contained 13 surface hearths, three rock ovens, nine pit features interpreted as smudge pits, and two large concentrations of charcoal. Artifacts associated with the St. Albans components included formalized tools such as projectile points, end scrapers, perforators, and gravers, as well as numerous items classified as site furniture (e.g., milling stones, hammerstones, pitted cobbles, and chopper/scrapers). After detailed spatial analyses of these data and similar analyses of archaeological manifestations representing a later LeCroy component at the Rose Island site, Kimball (1981:68-69) proposed a generalized model for Early Archaic base camp structure that made distinctions among shelter, family hearth, flintknapping, and hideworking activity space:

> The model site structure proposed for Early Archaic residential sites . . . is the location of surface hearth[s] in front of the shelter. A wide range of activities, such as nut processing, food consumption, limited flintknapping, tool maintenance, hideworking, and assumedly socializing, is localized around the family hearth. Warm climate shelters were used for other activities, such as sleeping and the storage of personal possessions. Rock ovens, assumedly used for the roasting of game, are located near the family hearths or behind the shelter. Tool manufacture, use, and discard are localized, along with food consumption, around these facilities. The density and dispersion of these residues accumulate to a lesser degree than with the family hearth activity areas. Hidesmoking pits are maintained at a distance further from the family hearths but near the shelter. The intensity of primary, bifacial, bipolar, and blade reduction varies within knapping areas. This may represent either the passage of time between episodes of tool manufacture or the simultaneous use of these knapping methods by several individuals. In either case, intense flintknapping was conducted just outside the more generalized family hearth work space.

Only three St. Albans components were classified as probable logistical camps. Two of these were situated along the south side of the Little Tennessee River opposite Calloway Island (at the Martin Farm [40MR20] and Toqua [40MR6] sites). The other component was identified at the Calloway Island site (40MR41). Four St. Albans projectile points were collected from Calloway Island during archaeological sampling of a more extensive LeCroy phase component. Three of these were found in Strata IX-X where they were stratigraphically inseparable from earlier Kirk and later LeCroy assemblages (Chapman 1979). Although archaeological features were numerous, none could be definitely associated with the St. Albans occupation.

Nine components, identified by isolated St. Albans projectile point finds, were classified as activity loci. These were located along the first terrace of the Little Tennessee River, Tellico River valley, Island Creek valley, and within the uplands. As with the

other site categories, all were situated in close proximity to major streams.

LeCroy Phase. The LeCroy phase was also poorly represented within the Tellico site inventory (n=23 sites). Spatially, the pattern displayed by these sites was similar to that described above for the St. Albans phase. Only two sites were located outside the Little Tennessee River or Tellico River valleys (Table 77). LeCroy sites were sparsely distributed along the Little Tennessee River between Bussell Island and Bacon Bend, and along Tellico River at the southern end of the study area (Figure 43). Four sites were not classified by site type because too few artifacts or archaeological features were encountered.

Eight LeCroy sites were classified as probable base camps. All were situated along the first terrace of the Little Tennessee River and exhibited evidence of archaeological features. Six of these sites were located between Calloway Island and Rose Island. LeCroy components were well sampled through excavations at Rose Island (40MR44), Icehouse Bottom (40MR23), and Calloway Island (40MR41). Artifact and feature assemblages from these sites are similar to those described above for Kirk and St. Albans base camps, with similar behavioral implications. Indeed, Kimball's (1981) residential site structure model is based in part upon an analysis of the LeCroy component (Stratum VIIA) at Rose Island. The thickness (1.0-1.5 ft) of sediments containing LeCroy phase material at Icehouse Bottom suggests that some of these base camp sites experienced repeated

occupations (see Chapman 1977), a pattern observed for Upper Kirk and St. Albans phases as well.

Only two LeCroy logistical camps were identified in the sample. These were located along Tellico River at the southern end of the study area and on the T-2 terrace at the mouth of Island Creek (40MR3). Two LeCroy projectile points were recovered at each site. The material from 40MR3 may be directly associated with the nearby LeCroy occupation on Rose Island.

Finally, nine LeCroy components were identified by isolated projectile point finds. These were more broadly distributed throughout the study area and occurred on all major landforms except for Tellico River valley slopes and major tributary valleys and valley slopes. At most of these sites, as well as at the two probable logistical camps, several other cultural components were also recognized. This situation prevented the identification of other potentially associated artifacts. Most of these sites are thought to reflect hunting activities.

Kanawha Phase. Kanawha phase components were identified at only 17 sites (Table 78; Figure 44). A majority (n=10) of these components were represented by single projectile points within larger artifact collections that contained evidence of other cultural occupations.

Four Kanawha phase sites were classified as probable base camps. Three of these (Bacon Farm - 40LD35, Patrick - 40MR40, and Rose Island - 40MR44), situated along the first terrace of the Little Tennessee River, were identified in stratigraphic context and contained additional evidence of archaeological features (Chapman 1975, 1977,

1978). A fourth base camp was identified on an old alluvial terrace remnant at the Tellico Blockhouse site (40MR50), based upon a high density of Kanawha Stemmed projectile points. Unlike most base camps of the Kirk, St. Albans, and LeCroy phases, none of the Kanawha sites appeared to have been intensively utilized. Artifact densities were comparatively low at all four sites and few features (e.g., hearths, basins, and fired areas) were observed. In short, the extant archaeological database provided only limited evidence for residential site use during the Kanawha phase.

The remaining sites also indicate a limited occupation of the lower Little Tennessee River valley during this phase. Three Kanawha phase logistical camps were identified. Two of these, occurring at Harrison Branch (40MR21) and Icehouse Bottom (40MR23), were buried components that contained only a few projectile points and lacked associated features. The third (40MR65) was an upland site overlooking Calloway Island. The 10 sites classified as probable activity loci were more randomly distributed within the study area and occurred on all major landforms except along Tellico River valley slopes and major tributary valley slopes. In the absence of a large site sample, little else can be offered at present regarding Kanawha phase settlement patterns.

Summary. Numerous sites were recorded that contained evidence of use by Early Archaic peoples. Although the initial Archaic presence, represented by Dalton materials, was limited and sporadic, progressively more intense occupation of the region is reflected during the Lower Kirk and Upper Kirk phases. During these phases,

residential base camps were established along the first terrace of the Little Tennessee River and along the front edge of older alluvial terraces situated near the river. Several Upper Kirk base camps experienced intensive and repeated use. Logistical camps, interpreted as specialized short-term hunting camps, were often positioned near the back edge of the Little Tennessee River valley or along major tributary valleys. During the Upper Kirk phase, some logistical camps were established along Tellico River. The transition from Lower Kirk to Upper Kirk was also accompanied by substantially greater use of the uplands. The numerous Upper Kirk activity loci recorded here suggests a focus upon hunting in this area and contrasts sharply with subsequent Early Archaic occupations.

Following the Upper Kirk phase, the intensity of occupation within the study area apparently diminished for reasons not yet understood. Progressively fewer sites were identified for the St. Albans, LeCroy, and Kanawha phases. Base camps were invariably located along the first terrace of the Little Tennessee River, and some St. Albans and LeCroy camps were intensively occupied. Kanawha base camps, conversely, were only poorly represented in the site inventory and suggest sporadic use. Logistical camp sites were also poorly represented for the three phases. Sites classified as activity loci occurred on a more diverse range of landforms but usually were situated in close proximity to the Little Tennessee River. This pattern contrasts sharply with the more dispersed spatial pattern observed for the two Kirk phases and indicates a much greater focalization of activity (though limited) along the Little Tennessee

River valley during the St. Albans, LeCroy, and Kanawha phases.

Middle Archaic Period

One hundred ninety-nine Middle Archaic (6,000-3,000 B.C.) components were identified in the site inventory. Only 13 (6.5%) of these represented buried strata that could not be classified according to probable site function. Criteria used in classification were similar to those described above for Early Archaic sites and were based largely upon variability in projectile point density. Additional data regarding overall artifact and feature assemblages were utilized for those components identified by backhoe testing or more extensive excavation. Distributions of Middle Archaic cultural components by site type and landform are summarized in Tables 79-82. Component locations are mapped in Figures 45-48.

Kirk Stemmed/Stanly Phases. The Kirk Stemmed (6,000-5,800 B.C.) and Stanly (5,800-5,500 B.C.) phases were combined for the purpose of settlement pattern analysis. This was done because of difficulties in distinguishing between the two using projectile points as a primary criterion of component identification. Kirk Stemmed/Stanly cultural components were recognized at 64 sites within the study area. Only a small number of these (n=8) were not evaluated during settlement analysis due to an absence of diagnostic artifacts or features (Table 79). Sites were identified from all major landforms and were distributed along the entire course of the Little Tennessee River and most of Tellico River (Figure 45).

Eleven sites were classified as probable base camps. Ten of these sites, situated along the first terrace of the Little Tennessee

Table 79. Distribution of Kirk Stemmed/Stanly phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	10	90.9	3	16.7	6	22.2	8	100.0	27	42.2
T-2 Terrace	1	9.1	2	11.1	3	11.1	0	0.0	6	9.4
>T-2 Terrace	0	0.0	2	11.1	1	3.7	0	0.0	3	4.7
LTRV Slope	0	0.0	2	11.1	2	7.4	0	0.0	4	6.2
Tellico Valley	0	0.0	4	22.2	6	22.2	0	0.0	10	15.6
Tellico Slope	0	0.0	0	0.0	2	7.4	0	0.0	2	3.1
Tributary Valley	0	0.0	1	5.6	2	7.4	0	0.0	3	4.7
Tributary Slope	0	0.0	0	0.0	1	3.7	0	0.0	1	1.6
Upland	0	0.0	4	22.2	4	14.8	0	0.0	8	12.5
Total	11	100.0	18	100.0	27	99.9	8	100.0	64	100.0

Site Types: A - Base Camp
B - Logistical Camp
C - Activity Locus
D - Indeterminate Type

Table 80. Distribution of Morrow Mountain phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	4	57.1	2	11.8	11	25.6	5	100.0	22	30.5
T-2 Terrace	3	42.9	2	11.8	5	11.6	0	0.0	10	13.9
>T-2 Terrace	0	0.0	3	17.6	2	4.7	0	0.0	5	6.9
LTRV Slope	0	0.0	1	5.9	3	7.0	0	0.0	4	5.5
Tellico Valley	0	0.0	3	17.6	9	20.9	0	0.0	12	16.7
Tellico Slope	0	0.0	1	5.9	1	2.3	0	0.0	2	2.8
Tributary Valley	0	0.0	1	5.9	2	4.7	0	0.0	3	4.2
Tributary Slope	0	0.0	1	5.9	1	2.3	0	0.0	2	2.8
Upland	0	0.0	3	17.6	9	20.9	0	0.0	12	16.7
Total	7	100.0	17	100.0	43	100.0	5	100.0	72	100.0

Site Types: A - Base Camp
B - Logistical Camp
C - Activity Locus
D - Indeterminate Type

Table 81. Distribution of sites producing Guilford projectile points.

Landform	Site Type A n	A %	B n	B %	Total n	Total %
T-1 Terrace	1	33.3	4	44.4	5	41.7
T-2 Terrace	2	66.7	2	22.2	4	33.3
>T-2 Terrace	0	0.0	1	11.1	1	8.3
LTRV Slope	0	0.0	0	0.0	0	0.0
Tellico Valley	0	0.0	1	11.1	1	8.3
Tellico Slope	0	0.0	0	0.0	0	0.0
Tributary Valley	0	0.0	0	0.0	0	0.0
Tributary Slope	0	0.0	0	0.0	0	0.0
Upland	0	0.0	1	11.1	1	8.3
Total	3	100.0	9	99.9	12	99.9

Site Types: A - Logistical Camp
B - Activity Locus

Table 82. Distribution of sites producing Sykes projectile points.

Landform	Site Type A n	A %	B n	B %	C n	C %	Total n	Total %
T-1 Terrace	1	50.0	3	23.1	9	25.0	13	25.5
T-2 Terrace	1	50.0	1	7.7	4	11.1	6	11.8
>T-2 Terrace	0	0.0	1	7.7	7	19.4	8	15.7
LTRV Slope	0	0.0	0	0.0	2	5.6	2	3.9
Tellico Valley	0	0.0	6	46.1	6	16.7	12	23.5
Tellico Slope	0	0.0	0	0.0	1	2.8	1	2.0
Tributary Valley	0	0.0	1	7.7	4	11.1	5	9.8
Tributary Slope	0	0.0	0	0.0	0	0.0	0	0.0
Upland	0	0.0	1	7.7	3	8.3	4	7.8
Total	2	100.0	13	100.0	36	100.0	51	100.0

Site Types: A - Base Camp
B - Logistical Camp
C - Activity Locus

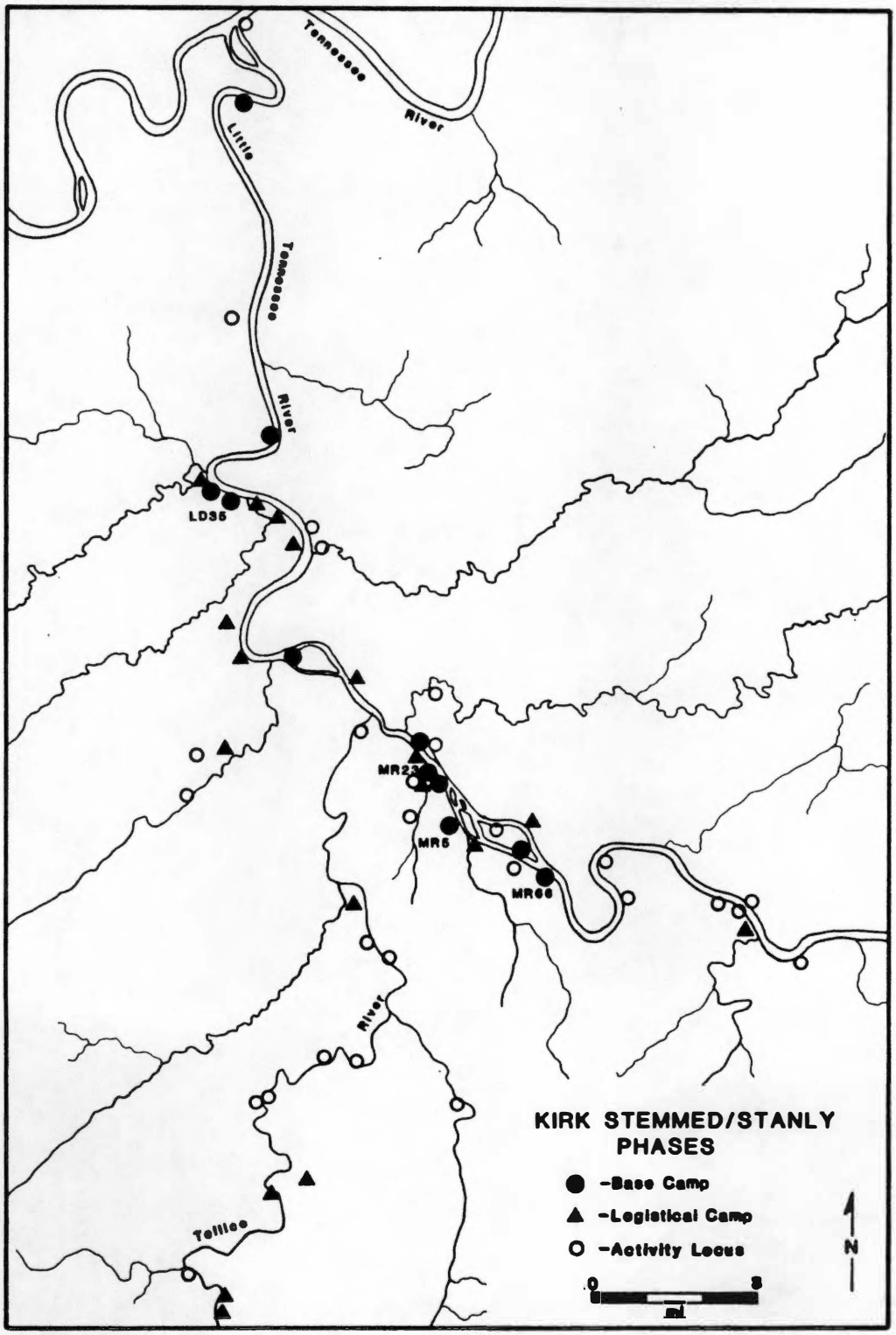


Figure 45. Location of Kirk Stemmed/Stanly phase sites.

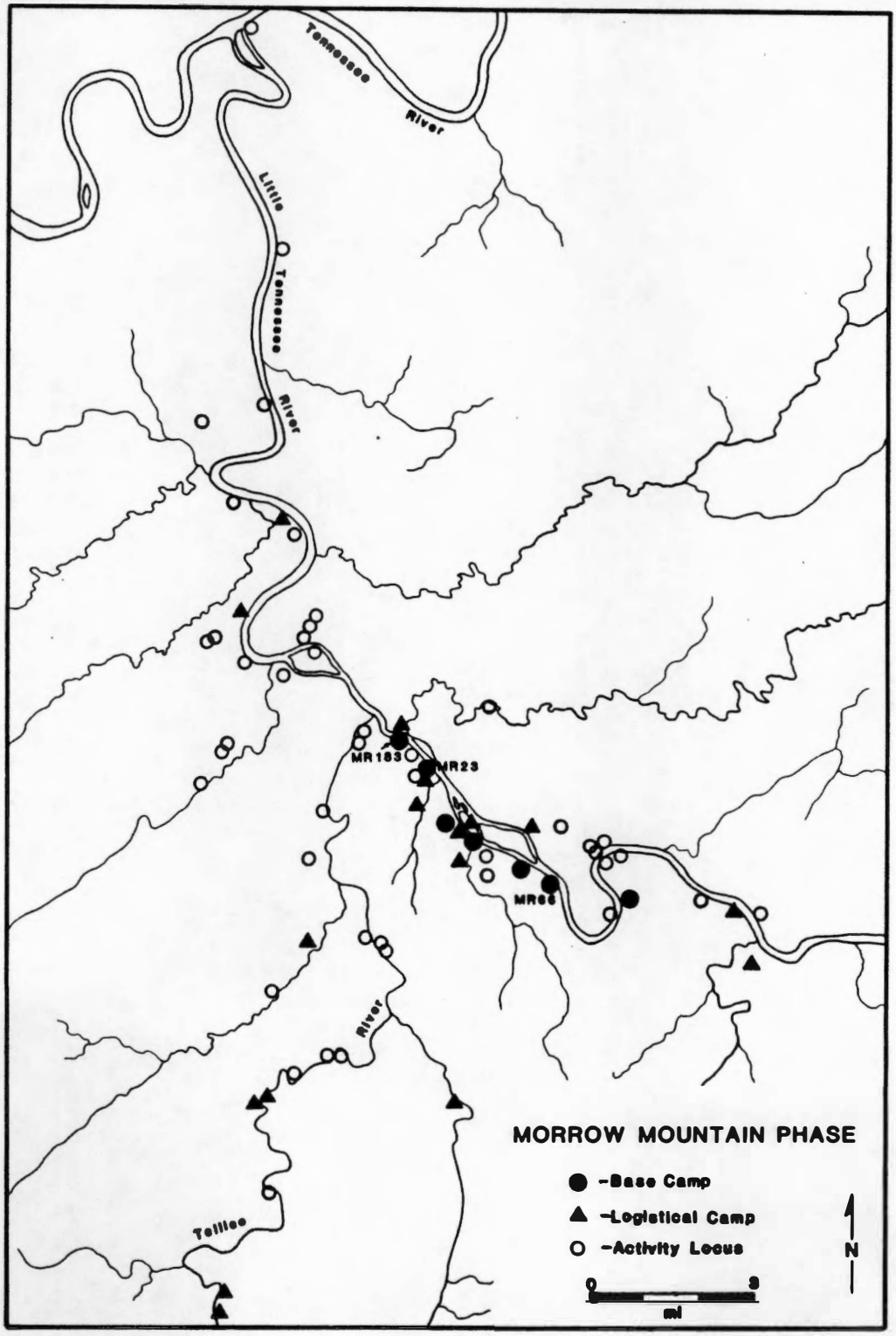


Figure 46. Location of Morrow Mountain phase sites.

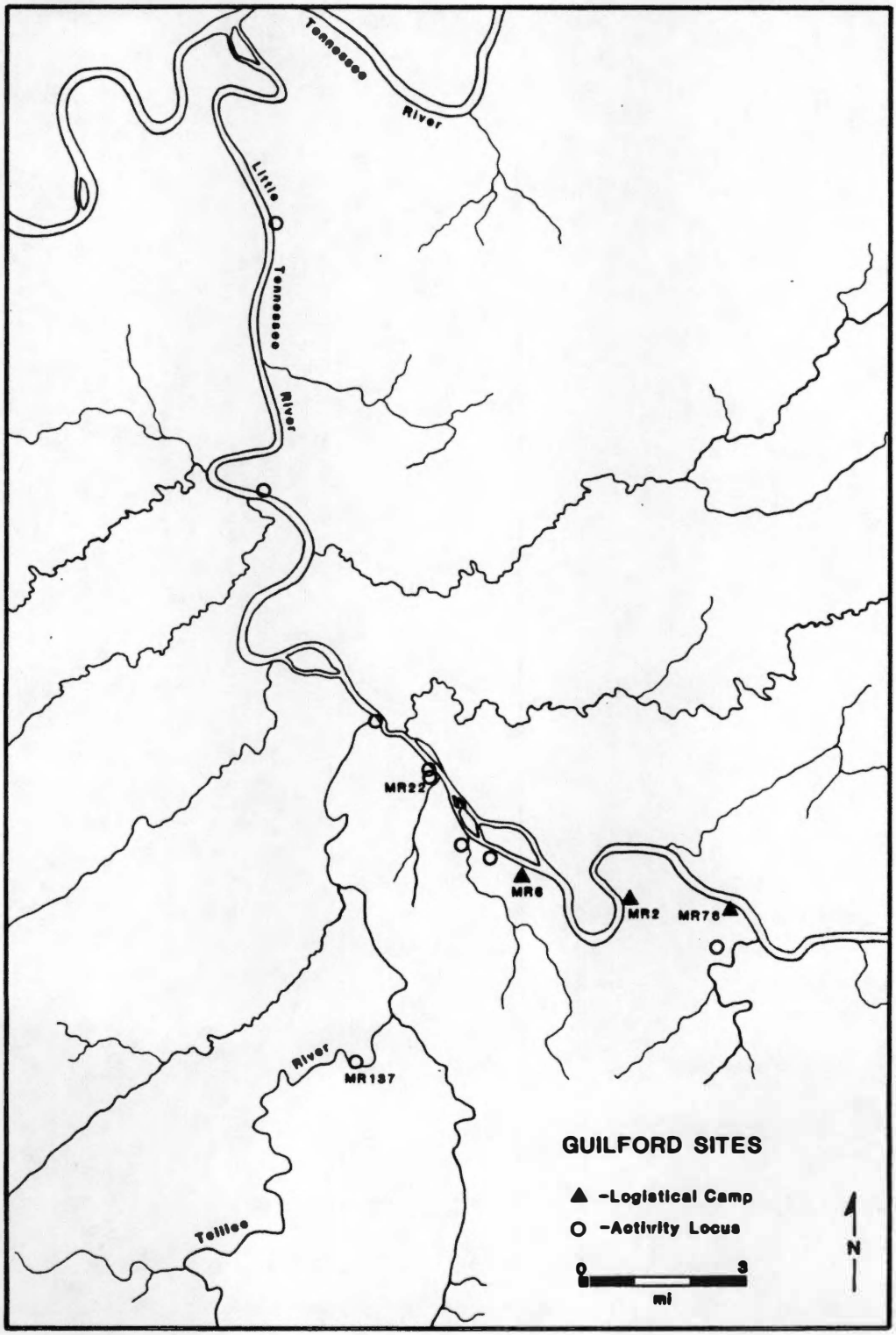


Figure 47. Location of Guilford sites.

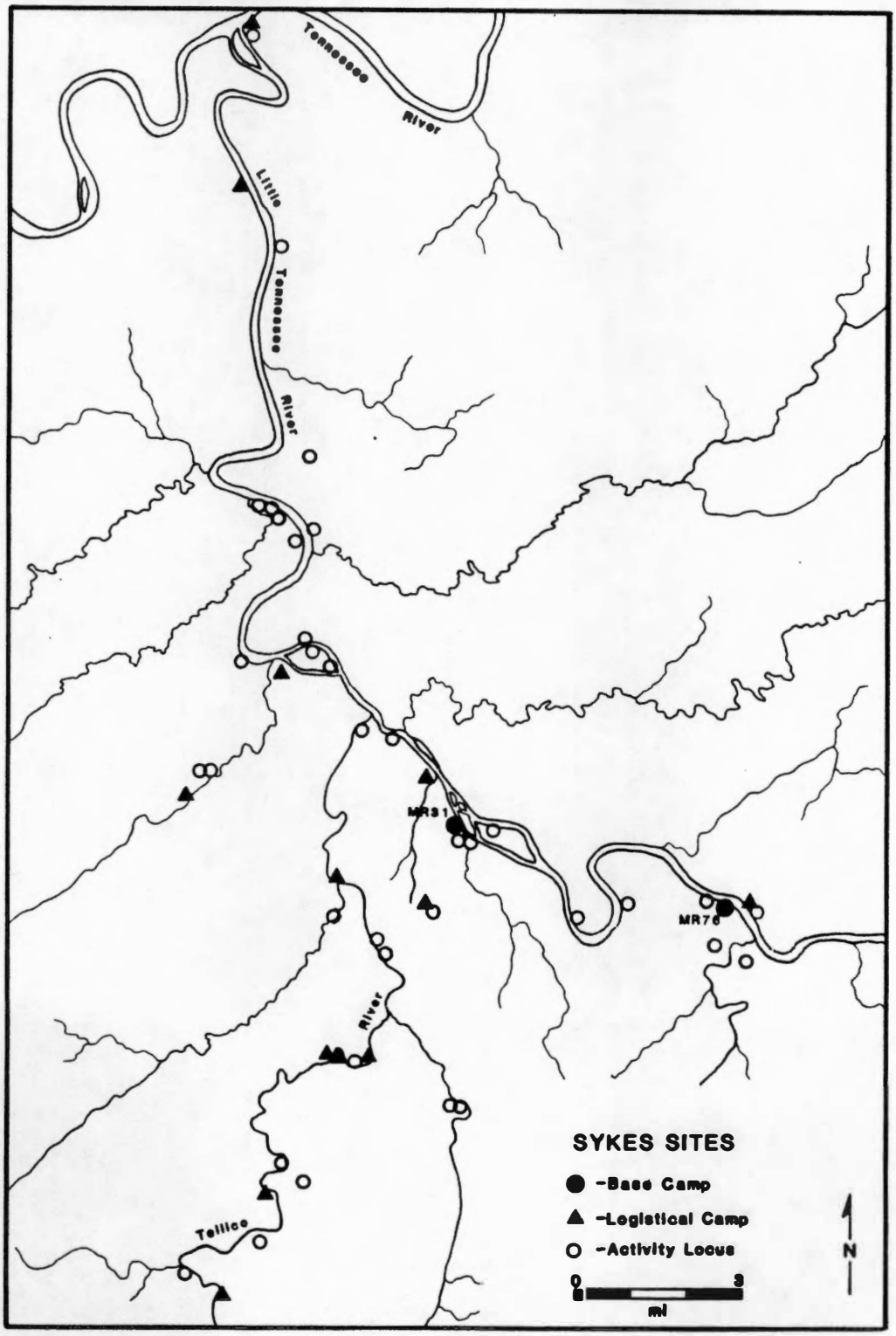


Figure 48. Location of Sykes sites.

River, contained evidence of archaeological features and most also yielded comparatively large numbers of projectile points. Another Kirk Stemmed/Stanly base camp was tentatively identified from projectile points excavated at the Tomotley site (40MR5) (Guthe and Bistline 1978; Baden 1983). Because these excavations covered several acres, it is possible that the artifact sample from this site reflects less intense activity than that implied by a base camp designation.

Buried strata containing archaeological evidence for Kirk Stemmed/Stanly base camps were excavated at the Bacon Farm (40LD35 - Stratum V), Icehouse Bottom (40MR23 - Stratum D), Rose Island (40MR44), and Howard (40MR66 - Strata VIII-IX) sites (Chapman 1975, 1977, 1978, 1979). Multiple Kirk Stemmed/Stanly occupations were recorded at each site. The predominant feature types at these sites were prepared and unprepared hearths, surface concentrations of rock, and shallow basins. Other features included straight-sided pits, globular pits, and concentrations of artifacts. No architectural evidence was observed. Lithic tools comprising the artifact assemblages of these components included projectile points, atlatl weights, knives, drills, end scrapers, pièces esquillées, and numerous flake cutting tools. In addition to accumulations of lithic reduction debris reflecting tool production and maintenance, several items of site furniture representing tool fabrication, food processing, and food procurement were also recovered. These items consisted of pitted cobbles, hammerstones, manos, milling stones, chopper/scrapers, and netsinkers. Notched-pebble netsinkers, appearing for the first time during the Kirk Stemmed/Stanly phases, were the most abundant site

furniture within all three assemblages. Whether this represents a shift toward a more riverine-oriented economy or simply a technological enhancement within an existing resource procurement strategy is undetermined; however, the appearance of netsinkers does not coincide with any noticeable shift in base camp site location. It is suspected, given the positioning of most base camps along the front edge of the first terrace immediately adjacent to the Little Tennessee River, that riverine resources were important to the subsistence economies of all Archaic cultures in the valley.

Unlike earlier phases, numerous (n=18) Kirk Stemmed/Stanly sites were classified as logistical camps. Sites were identified on all major landforms except Tellico River and tributary valley slopes, and were well represented within all alluvial terrace categories, along Tellico River, and within the uplands. Substantially greater exploitation of the Tellico River valley is indicated during the Kirk Stemmed/Stanly phases than during the Early Archaic period. This pattern is also supported by the distribution of sites classified as activity loci. Sites along Tellico River and its tributaries comprised one third of all activity loci (n=27). Elsewhere within the study area, Kirk Stemmed/Stanly logistical camps and activity loci were spatially concentrated between Calloway Island and the mouth of Fork Creek.

Morrow Mountain Phase. Seventy-two Morrow Mountain phase sites were recorded (Table 80). Only five of these were identified solely on the basis of stratigraphic position and thus were not classified by probable site type. Morrow Mountain sites were widely distributed

throughout the study area, particularly along the Little Tennessee River above Bat Creek and along Tellico River (Figure 46).

Seven Morrow Mountain components were classified as probable base camps. These sites were situated on first (n=4) and second (n=3) terraces along a six-mile segment of the Little Tennessee River between Bacon Bend and the mouth of Tellico River. With a single exception (40MR183), all of these sites yielded numerous Morrow Mountain I or Morrow Mountain II projectile points. Backhoe testing at three of the first terrace sites (Icehouse Bottom - 40MR23; Howard - 40MR66; and 40MR183) yielded evidence of cultural features in association with Morrow Mountain phase materials. Subsequent excavations at Icehouse Bottom (Strata B-C) and Howard (Strata VII) provided archaeological documentation of features and artifact assemblages present at Morrow Mountain base camps. The Morrow Mountain strata at both sites appeared to contain the remains of multiple and intensive occupations. In summarizing the Morrow Mountain component at the Howard site, Chapman (1979:81) noted:

> This occupation was manifested in Stratum VII, a pronounced buried cultural horizon extending along the crest and front edge of the first terrace for approximately 2000 ft. The whole terrace was probably not occupied at any one time, but instead what remains is evidence of horizontal overlap of successive visitations. It is possible also that the second terrace was utilized when higher ground was needed.

This linear configuration of base camp residues along the front edge of the first terrace was most strongly manifested by the settlement pattern of the Late Archaic Iddins phase.

Excavated remains from the Howard and Icehouse Bottom sites suggest a complex of occupational features similar to the preceding

Kirk Stemmed/Stanly phases. Specifically, these sites contained numerous features including hearths, surface concentrations of rock, basins, and pits. Whereas lithic artifact assemblages were also similar with respect to activities represented, fewer kinds of site furniture were recovered (e.g., netsinkers, pitted cobbles, hammerstones, and chopper/scrapers).

Seventeen Morrow Mountain components were interpreted as probable logistical camps and occurred on all major landforms within the study area. The majority (n=13) were located either along the Little Tennessee River between Calloway Island and the mouth of Tellico River (near sites classified as base camps) or within the Tellico River drainage, and reflect essentially the same regional pattern observed for the Kirk Stemmed/Stanly phases.

Sites classified as activity loci were particularly abundant (n=43) and also occurred on all major landforms. Although the relative frequency distribution of activity loci across landforms shows no significant difference from the earlier Kirk Stemmed/Stanly distribution, a substantially greater number of Morrow Mountain sites were identified. This density increase may reflect more intensive "off-site" activities throughout the study area, associated with hunting. Given the corresponding decrease in base camp density and apparent localization of such camps along a short segment of the Little Tennessee River, this pattern suggests possible exploitation of the study area by groups that were based elsewhere. Such an exploitation pattern also may be responsible for increases in the occurrence

of quartz and quartzite artifacts within Middle Archaic lithic assemblages.

Guilford-Sykes. The latter part of the Middle Archaic period (ca. 5,000-3,000 B.C.) is poorly understood within the lower Little Tennessee River valley. Although no cultural components dating to this period were identified and sampled through excavation, the presence of Guilford and Sykes type projectile points within artifact collections indicate that the region was occupied during this period. However, the general paucity of such remains, particularly with respect to identifying base camp sites, strongly implies only a limited occupation.

Twelve sites produced Guilford projectile points (Table 81). Most of these sites were situated along the Little Tennessee River between Citico Creek and Tellico River (Figure 47). Although none contained sufficient numbers of projectile points to warrant their recognition as base camps, three sites (Chota - 40MR2; Toqua - 40MR6; and Jones Ferry - 40MR76) were classified as probable logistical camps. All of these sites are situated along the Little Tennessee River and were intensively sampled by excavation. The remainder (n=9) were recognized by single projectile points and thus were classified as activity loci. With two exceptions--40MR22 which was situated at the upland edge of the Little Tennessee River valley overlooking Icehouse Bottom and 40MR137 which was located along Tellico River—all activity loci were located along the alluvial terraces of the Little Tennessee River.

Sykes sites were more prevalent within the study area (Figure

48). Fifty-one such sites were identified including two sites classified as probable base camps (Table 82). These sites (Jones Ferry [40MR76] and 40MR31) were located on the first and second terrace of the Little Tennessee River above Tellico River. The 13 Sykes logistical camps were more widely distributed along the alluvial valleys of Tellico River and the Little Tennessee River. Finally, 36 sites were classified as activity loci. These sites occurred on all major landforms except for tributary valley slopes. Overall, the Sykes settlement pattern is very similar to those described for the Kirk Stemmed/Stanly and Morrow Mountain phases. In particular, sites were concentrated along the Little Tennessee River between Citico Creek and Bat Creek as well as along Tellico River. The high proportion of activity loci to other site types further suggests possible regional exploitation patterns discussed above for the Morrow Mountain phase.

Summary. The archaeological record for the Middle Archaic suggests that, following the Early Archaic period, the lower Little Tennessee River valley witnessed a gradual shift in settlement pattern that may reflect some fundamental changes in the overall configuration of regional land use and resource exploitation. Two potentially significant trends are evident.

First and most importantly, the sequence of settlement patterns identified for the Kirk Stemmed/Stanly, Morrow Mountain, and Sykes (undesignated) phases indicates a progressive decline in intensity of regional utilization. While this trend is not particularly evident by simply the number of sites identified for each phase, it becomes

strongly apparent when considering the frequencies of sites classified as probable base camps. There is a sharp decline in the percentage of base camps between the Kirk Stemmed/Stanly (17%) and Morrow Mountain (10%) phases. Even fewer (4%) Sykes base camps were identified. This observation, coupled with an absence of late Middle Archaic cultural components from excavations at stratified sites within the study area (see Chapman 1975, 1977, 1978, 1979), suggests that the archaeological record for the period from 5,000-3,000 B.C. may reflect mostly resource procurement activities of groups that were not based within the study area. Better data are needed for Middle Archaic occupations within adjacent river valleys (e.g., Tennessee River, upper Little Tennessee River, and Hiwassee River) before this possibility can be reasonably assessed.

Second, although a majority of Middle Archaic sites occurred along or adjacent to the Little Tennessee River valley, a substantial number of sites were also recorded within the Tellico River drainage. This spatial pattern differs markedly from Early Archaic site patterns but becomes even more noticeable during the Late Archaic Iddins phase. Both logistical camps and activity loci were represented and appear to reflect a well developed strategy for exploiting the resources (presumably game) of this drainage.

Finally, the small number of Guilford components requires some comment. For the present, this lack of evidence is not viewed as necessarily indicative of regional depopulation during a hypothetical "Guilford phase." This projectile point type, while ubiquitous in the Piedmont region of North Carolina, has only rarely been reported west

of the Appalachian Mountains. Thus, it probably was never a predominant Middle Archaic type within the Ridge and Valley province and may simply reflect contacts with, or increased mobility of, other culture groups to the east.

Late Archaic Period

One hundred twenty-four components were identified that could be assigned to cultural phases of the Late Archaic period (3,000-1,000 B.C.). Only five of these components lacked minimal evidence for functional interpretation. Criteria for classifying Late Archaic sites according to probable site function were the same as those described above for the Early Archaic and Middle Archaic periods. However, Iddins phase base camps were further differentiated as large and small. Large base camps were defined by high projectile point densities (usually >5 artifacts) in association with soapstone sherds or cultural features while small base camps were defined by low projectile point densities (usually <5 artifacts) in association with soapstone sherds or features. Iddins sites with low numbers of points were classified as probable logistical camps or activity loci when not associated with these other archaeological remains.

Though it can be demonstrated elsewhere that Savannah River peoples also made and used soapstone bowls (Coe 1964) and that these artifacts may be represented within Tellico Reservoir as early as the Kirk Stemmed/Stanly phases (see Chapman 1978:72), their association with the Savannah River occupation of the study area remains undemonstrated. In all instances where soapstone sherds were found along with Savannah River Stemmed projectile points, numerous Iddins

Undifferentiated Stemmed points were also present. Consequently, these artifacts were not considered in Savannah River site classification.

Site distributions by landform for the Savannah River and Iddins phases are provided in Tables 83-84; component locations by site type are mapped in Figures 49-50.

Savannah River Phase. The Savannah River phase occupation within the study area was represented by 22 sites. Only two of these lacked evidence for assessing site function (Table 83). Although Savannah River sites were restricted largely to the alluvial valley of the Little Tennessee River, three sites were also recorded along Tellico River, Ballplay Creek, and Island Creek (Figure 49).

Five Savannah River components were classified as probable base camps, and were situated along the first terrace (Bacon Farm - 40LD35; Harrison Branch - 40MR21; and Bacon Bend - 40MR25) and second terrace (Chota - 40MR2 and Toqua - 40MR6) of the Little Tennessee River. The latter two sites, each of which was extensively excavated (see Schroedl 1982; Polhemus 1983), produced large samples of Savannah River Stemmed projectile points but lacked features that could be definitely attributed to this phase. Excavations at Bacon Farm (Stratum IIB) and Harrison Branch (Strata IV-V) provided evidence of Savannah River points in possible association with cultural features, including surface concentrations of fire-cracked rock and rock-filled basins. However, later Iddins phase material was also obtained from these strata (see Schroedl 1975; Chapman 1978) and thus prevented a

Table 83. Distribution of Savannah River phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	3	60.0	3	42.9	2	25.0	2	100.0	10	45.5
T-2 Terrace	2	40.0	3	42.9	2	25.0	0	0.0	7	31.8
>T-2 Terrace	0	0.0	0	0.0	2	25.0	0	0.0	2	9.1
LTRV Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tellico Valley	0	0.0	0	0.0	1	12.5	0	0.0	1	4.5
Tellico Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Valley	0	0.0	1	14.3	1	12.5	0	0.0	2	9.1
Tributary Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Upland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	5	100.0	7	100.1	8	100.0	2	100.0	22	100.0

Site Types: A - Base Camp
B - Logistical Camp
C - Activity Locus
D - Indeterminate Type

Table 84. Distribution of Iddins phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	E n	E %	Total n	Total %
T-1 Terrace	11	64.7	16	59.3	2	10.0	9	25.7	3	100.0	41	40.2
T-2 Terrace	5	29.4	0	0.0	4	20.0	4	11.4	0	0.0	13	12.7
>T-2 Terrace	1	5.9	5	18.5	3	15.0	3	8.6	0	0.0	12	11.8
LTRV Slope	0	0.0	0	0.0	2	10.0	1	2.9	0	0.0	3	2.9
Tellico Valley	0	0.0	5	18.5	5	25.0	6	17.1	0	0.0	16	15.7
Tellico Slope	0	0.0	1	3.7	0	0.0	3	8.6	0	0.0	4	3.9
Trib. Valley	0	0.0	0	0.0	1	5.0	1	2.9	0	0.0	2	2.0
Trib. Slope	0	0.0	0	0.0	1	5.0	2	5.7	0	0.0	3	2.9
Upland	0	0.0	0	0.0	2	10.0	6	17.1	0	0.0	8	7.8
Total	17	100.0	27	100.0	20	100.0	35	100.0	3	100.0	102	99.9

Site Types:
A - Large Base Camp
B - Small Base Camp
C - Logistical Camp
D - Activity Locus
E - Indeterminate Type

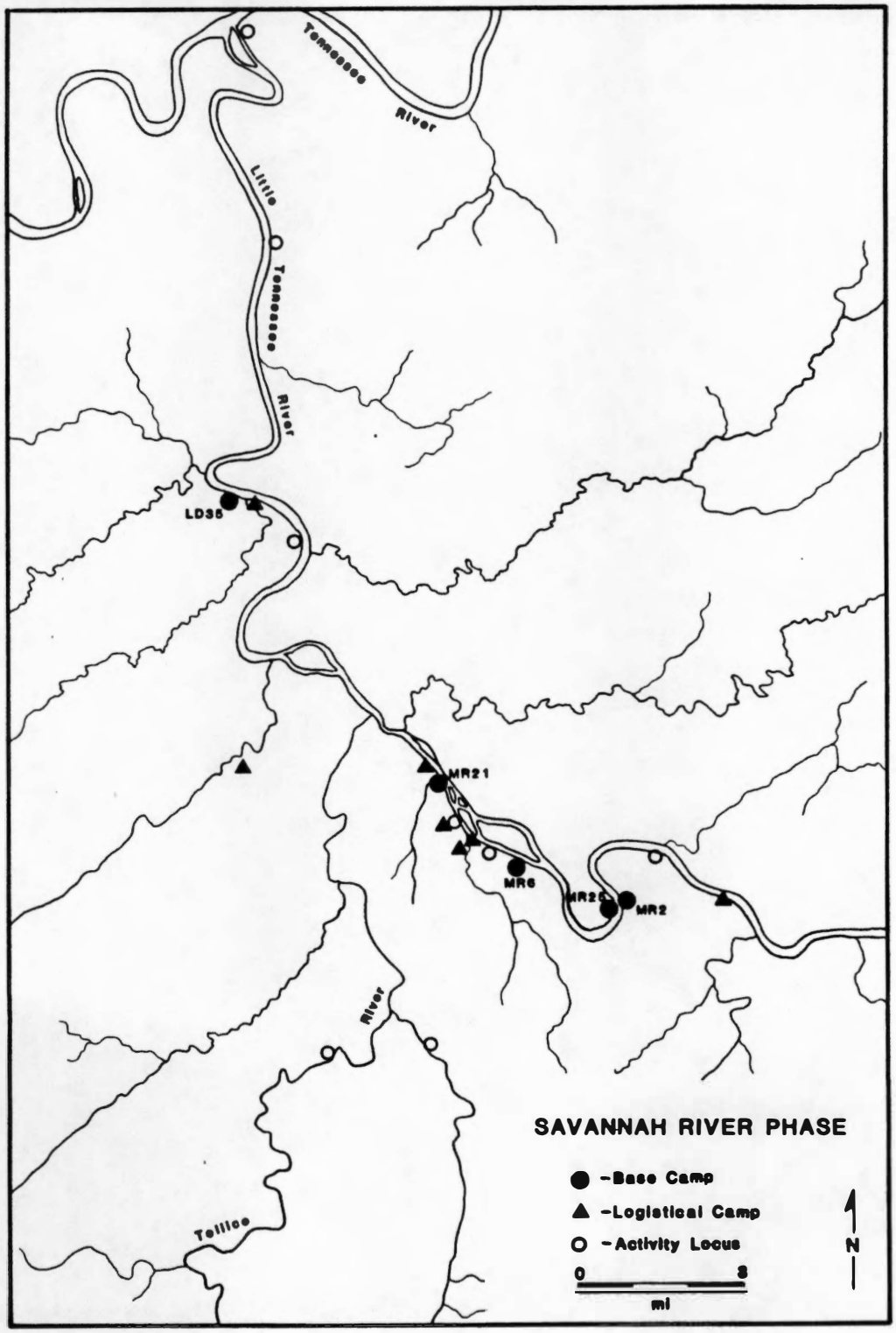


Figure 49. Location of Savannah River phase sites.

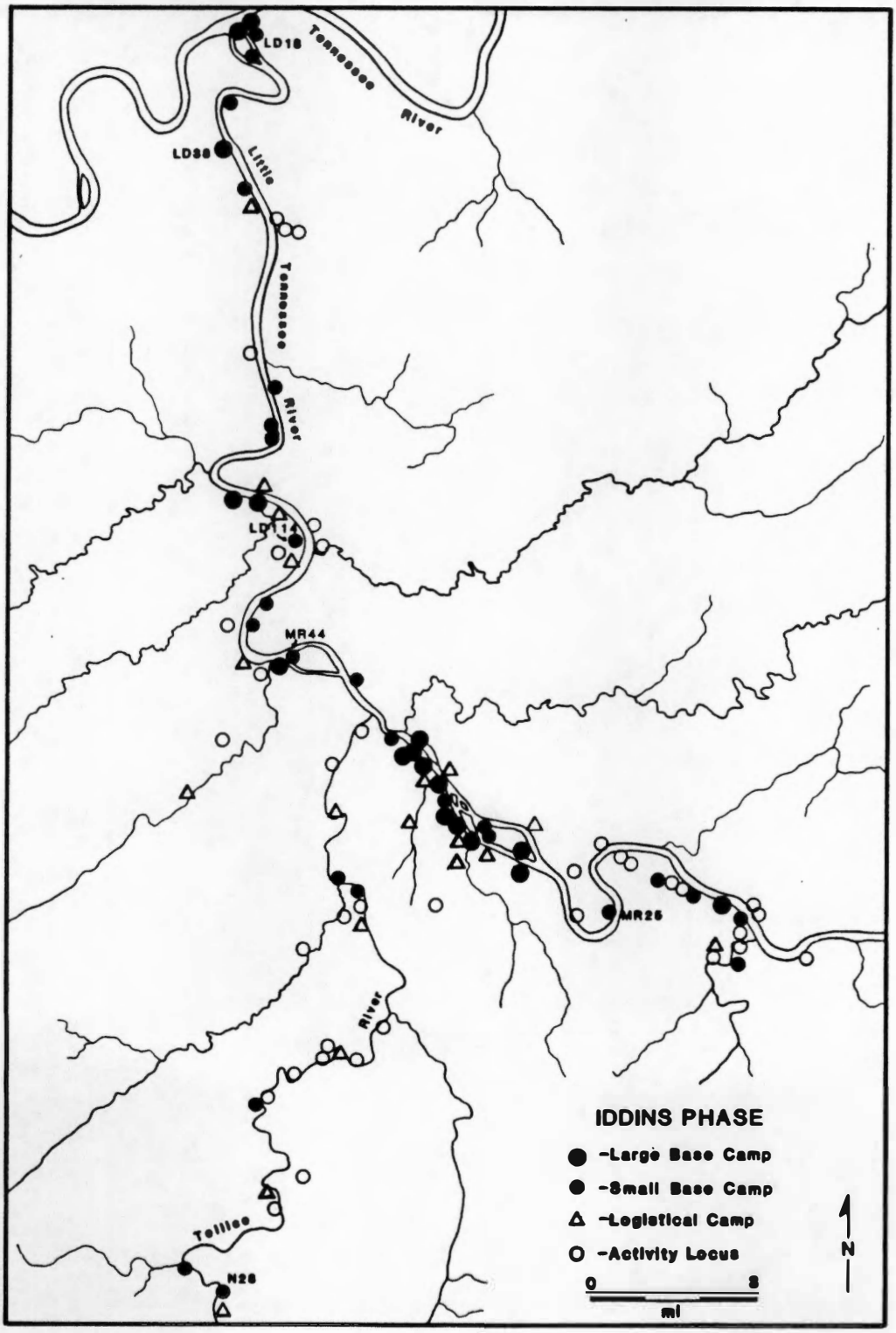


Figure 50. Location of Iddins phase sites.

more definite correlation of these features with Savannah River occupations.

The best evidence for a Savannah River base camp within the study area came from Bacon Bend. Here, stratigraphically sealed and uncontaminated sediments (Stratum 7) representing successive Savannah River phase occupations were sampled from an approximately 960 ft^2 excavation area (Chapman 1981). In summarizing these investigations, Chapman (1981:41) suggested that

> Stratum 7 at Bacon Bend represents a short term camp site of the Late Archaic Savannah River phase preserved within the T1 of the Little Tennessee River. . . . The density of features would suggest that the site was occupied on several occasions, but there is no evidence that this span represented any length of time. The occupation area is small, prehaps representing that of an extended family unit exploiting some local resource and returning periodically to the same place. Activities focused on the crest and front edge of the terrace.

Although artifact densities were generally low, the tool composition of the Bacon Bend lithic assemblage suggests maintenance activities that might be anticipated at a base camp. In addition to moderate densities of debitage evidencing activities of lithic tool manufacture and repair, the tool assemblage included discarded projectile points, end scrapers, a perforator, atlatl weights, hammerstones, and abraders. The occurrence of three hollow drill cores with an unfinished atlatl weight indicates that certain labor-intensive tool manufacturing activities were also conducted at the site.

The conspicuous absence of notched-pebble netsinkers and soapstone vessel fragments at Bacon Bend suggests either a more narrowly defined range of activities than has been reported at other Late Archaic sites in East Tennessee (Chapman 1981) or that these

items are not generally characteristic of the Savannah River phase in this area. The high percentage (28.8%) of non-local cherts represented in the chert bifacial thinning flakes from Stratum 7, as well as an absence of projectile points made from local cherts, is evidence of group mobility beyond the lower Little Tennessee River valley and suggests that Savannah River base camps identified within the study area may not be representative of the overall settlement system.

Features (n=27) associated with the Savannah River component at Bacon Bend included (in descending order of frequency), fire-cracked rock concentrations, fire pits, pits, basins/depressions, and fired areas. A similar range of features was reported from the Iddins phase component at the Iddins site (Chapman 1981).

Seven Savannah River components were classified as probable logistical camps. All but one of these were situated along the first or second terrace of the Little Tennessee River. The remaining site was identified along Island Creek. As with the base camps, the majority (n=5) of these sites were located at the upper end of the lower Little Tennessee River valley between Citico Creek and Tellico River.

Finally, eight components classified as activity loci were identified by single projectile points. With the exception of two sites within the Tellico River drainage, these sites were widely distributed on first, second, and older terraces of the Little Tennessee River along its entire course. When compared with the locations of probable base camps and logistical camps, this site distribution indicates a focalization of activity along the Little Tennessee River. The overall paucity of sites comprising the Savannah

River settlement pattern suggests only limited and possibly ephemeral activity within the study area.

Iddins Phase. In contrast to the Savannah River phase, Iddins phase sites were densely distributed throughout the study area (Figure 50). Over 30% (n=102) of all sites with identified cultural components contained evidence of Iddins phase occupations. Although Iddins components occurred on all major landforms, approximately 80% were situated within the alluvial valleys of the Little Tennessee and Tellico rivers (Table 84). Only three of these components, identified solely by stratigraphic position, are not considered in the following discussion.

As stated earlier, a distinction was made between large and small base camps on the basis of projectile point and soapstone sherd densities. Seventeen Iddins components were classified as large base camps. Almost two-thirds of these occurred along the front edge of the first terrace while the remainder were situated along the second and older terraces close to the Little Tennessee River. Although large base camps were distributed along the entire length of the Little Tennessee River within the study area, the majority (n=10) occurred along a short three-mile segment of the valley between Calloway Island and Thirty Acre Island. Most of these sites produced large numbers of soapstone sherds and netsinkers (probably associated) in addition to having high densities of Iddins Undifferentiated Stemmed projectile points. Of the 16 large base camps that were sampled by either testing or more intensive excavation, seven contained evidence of associated cultural features.

Archaeological excavations at the Iddins site (40LD38) provided extensive data about large Iddins phase base camps (Chapman 1981). In fact, these were the only investigations undertaken within the lower Little Tennessee River valley that were specifically designed to study the Late Archaic occupation (The initial goals of the 1977 investigations at Bacon Bend were to sample Early Woodland and late Middle Woodland components [Chapman 1981:4]). Archaeological residues associated with the Iddins phase occupation at the Iddins site were stratigraphically sealed within Stratum III. Approximately 2,670 ft^2 of this zone was exposed by the excavation.

The most striking aspect of the Iddins site is the dense concentration of features and artifacts that were observed, and suggests that this site experienced both intensive and repeated occupations during the Iddins phase. Of the 121 cultural features excavated at the site, over 80% (n=101) were circular shallow fire pits containing large quantities of fire-cracked rock and charcoal. Most of these features either intruded into or were intruded by other fire pits, and occurred in a linear band along the crest of the first terrace, parallel to the Little Tennessee River. Other features, including shallow pits, surface concentrations of rock, netsinker concentrations (caches?), fired areas, and four shallow basins containing cremated human remains, were more broadly distributed along the back side of the fire pit area away from the river. The four cremations were farthest removed from the band of fire pits.

High densities of artifacts were also reported at the Iddins site. In addition to numerous projectile points (n=341), end

scrapers, drills, pièces esquillées, utilized flakes, and bifaces, several items interpreted as site furniture were also recovered. These included notched-pebble netsinkers (n=394), soapstone bowl fragments (n=339), hammerstones, pitted cobbles, abraders, choppers, and grooved axes. The ubiquity of netsinkers at the site led Chapman (1981:48) to suggest that "one of the principal activities was apparently fishing." In addition to fishing, several other activities expected at a base camp site (e.g., lithic tool manufacture and repair, butchering, food processing, woodworking, and mortuary) were also well represented.

The Late Archaic data from the Iddins site allow for certain general interpretations regarding base camp structure. First, any single base camp occupation was probably not spatially intensive but instead consisted of one or more extended families linearly dispersed along the terrace crest. Hearths consisted of shallow pits, utilized river cobbles to retain heat, and were placed along the river side of the general habitation area. Although architectural features (i.e., postholes) were generally lacking at the site, it is likely (based on the distribution of other features) that each individual family structure was located immediately adjacent to the hearth and away from the river. This lack of architectural data may reflect either temporary structures of light construction or possibly the use of existing vegetation as structure supports (see Chapman 1981:129). The dispersed distribution of other cultural features within this hypothetical house area suggests that more specialized activities were undertaken in this area as well, probably within open areas between

individual houses. Such an interpretation is also supported by the spatial distribution of debitage, chipped-stone tools, and site furniture (see Chapman 1981:103-113). Finally, the area behind the houses and beyond the major zone of activity appears to have been reserved for mortuary activities. Unfortunately, this area was insufficiently sampled to assess the full extent of these activities.

Twenty-seven Iddins phase components were classified as small base camps. While a majority (59%) of these components were situated on the first terrace of the Little Tennessee River, several sites also occurred along older alluvial terraces and along Tellico River. Only five of these sites (40LD18, 40LD114, 40MR25, 40MR44, and N28) were sampled by archaeological excavation and none produced sufficient data for characterizing these occupations. Observations made about assemblage content and structure at the Iddins site are thought to be generally applicable to these sites as well. As with large base camps, small base camps were distributed along the entire length of the lower Little Tennessee River valley. Perhaps more significantly, several sites were also identified along Tellico River, providing the first evidence for a residential population within this drainage.

Sites classified as probable logistical camps (n=20) and activity loci (n=35) were similarly distributed within the study area and occurred on all major landforms. However, most were located within the alluvial valleys of the Little Tennessee and Tellico rivers, and suggest an intensive riverine adaptation. Because of the possibility that projectile point forms associated with the Iddins phase may have persisted into the Early Woodland Watts Bar phase (where no diagnostic

projectile point types are recognized), all of these sites may not have an Iddins phase cultural association. In any event, it is likely that this segment of the Iddins settlement pattern, reflecting more ephemeral activities associated with hunting and other kinds of resource acquisition, is equally applicable to the subsequent Watts Bar phase.

Summary. The archaeological records of the Late Archaic Savannah River and Iddins phases, when viewed from the perspective of settlement density and distribution, are markedly different despite much greater similarity in overall material culture. The Savannah River phase, characterized by an extremely low site density and extensive evidence for group mobility well beyond the lower Little Tennessee River valley, appears to represent a continuation of the pattern observed for much of the Middle Archaic period. Specifically, the data suggest that during this period (ca. 5,500-1,800 B.C.) the study area was incorporated into larger territorial areas in which activities were either more regionally dispersed or more concentrated in river valleys adjacent to the lower Little Tennessee River valley. Either possibility could be expected to have the same consequence upon the archaeological record of the study area—namely, settlement patterns reflecting either limited occupations or activities that were associated largely with resource extraction rather than group maintenance.

In contrast, the Iddins settlement pattern reflects an intense and localized adaptation to the lower Little Tennessee River valley and Tellico River valley. In addition to a spatial pattern that

suggests a strong riverine focus, possibly involving extensive exploitation of aquatic resources, there is ample evidence for hunting within the uplands as well. In short, the kinds and frequencies of sites comprising the Iddins phase settlement pattern indicate an intensive regional occupation in which a majority of activities involved within a seasonal round were probably undertaken within the study area.

Unfortunately, little can be stated with reasonable certainty about the seasonality of individual sites or how they may have articulated within a seasonal round. Paleobotanical evidence from the Bacon Bend and Iddins sites, as well as from virtually all Archaic period base camps excavated within the lower Little Tennessee River valley, indicate a summer to late fall occupation. However, questions about the extent of occupation beyond that period and the exact length of a particular occupation cannot and may never be answered. It does seem likely, given present information about seasonality of flooding and inundation of the first terrace, that sites along this landform probably were not occupied continuously during the winter and spring months.

Early Woodland Period

The Early Woodland period (1,000-200 B.C.) in the lower Little Tennessee River valley is represented by the Watts Bar phase. Watts Bar cultural components, recognized by the presence of coarse crushed quartz-tempered pottery conforming to the Watts Bar ceramic series, were identified at 52 sites within the study area. Although two additional components were assigned to the Watts Bar phase solely

because of their stratigraphic position, no attempt was made to interpret the probable function of these sites.

Watts Bar sites were classified into one of three site categories based upon potsherd density and the detection of archaeological features or midden accumulations. These categories were defined as follows: large base camp (>20 potsherds recovered or archaeological features/midden observed); small base camp (>5-20 potsherds recovered); and logistical camp/residence (1-5 potsherds recovered). As with site classifications for the preceding Iddins phase, the distinction between large and small base camps reflects simply a perceived difference in the density of observed archaeological remains. While no underlying functional difference in the sense of a settlement hierarchy is implied, this possibility cannot be reasonably explored using available data. Because no diagnostic projectile point types are currently recognized for the Watts Bar phase, it was not possible to identify components, such as logistical camps and activity loci, that are thought to represent mostly non-residential activities associated with resource extraction. The distributions of these kinds of sites are thought to be similar to those described earlier for the Late Archaic Iddins phase.

Twenty-two sites were classified as probable large base camps. Eleven of these contained evidence of archaeological features representing primarily hearths. All of these sites were located either along the first terrace of the Little Tennessee River or on the second terrace in close proximity to the river (Table 85). Though concentrated along a short segment of the valley between Calloway

Table 85. Distribution of Watts Bar phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	16	72.7	3	60.0	18	72.0	2	100.0	39	72.2
T-2 Terrace	6	27.3	1	20.0	3	12.0	0	0.0	10	18.5
>T-2 Terrace	0	0.0	1	20.0	2	8.0	0	0.0	3	5.6
LTRV Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tellico Valley	0	0.0	0	0.0	2	0.8	0	0.0	2	3.7
Tellico Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Valley	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Upland	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	22	100.0	5	100.0	25	100.0	2	100.0	54	100.0

Site Types: A - Large Base Camp
B - Small Base Camp
C - Logistical Camp/Residence
D - Indeterminate Type

Island and Thirty Acre Island, several large base camps were also identified elsewhere along the river (Figure 51). A similar spatial pattern was noted for large base camps of the preceding Iddins phase.

Although many (n=15) large Watts Bar base camps were identified by archaeological excavation, only two sites--Martin Farm (40MR20) and Bacon Bend (40MR25)—provided relatively unambiguous data for characterizing artifact assemblage and feature content. Unfortunately, sampling of Watts Bar remains at both sites was extremely limited and was conducted during the first year of the Tellico Archaeological Project when most fieldwork was largely exploratory in design (see Salo 1969). Subsequent and more intensive investigations at each site (e.g., Chapman 1981; Schroedl et al. 1985) focused on other cultural components.

The Watts Bar occupation at the Martin Farm site was apparently concentrated along the front edge of the first terrace. Archaeological deposits resulting from this occupation occurred as a buried midden (Zone 4) approximately 1.0 ft thick, and was exposed within a 1,200 ft^2 area (Salo 1969). An additional 10x20 ft area was excavated adjacent to this block in 1975 but added no significant new information (Schroedl et al. 1985). Only four features were identified that could be attributed to the Watts Bar phase and consisted of one surface fire or shallow fire basin and three small refuse-filled pits. In addition, numerous fire-cracked rock, pottery, and other artifacts were scattered throughout Zone 4, suggesting intensive site use. A few postholes were also observed within this zone; however, no house-wall alignments were evident. The prevalence of notched-pebble

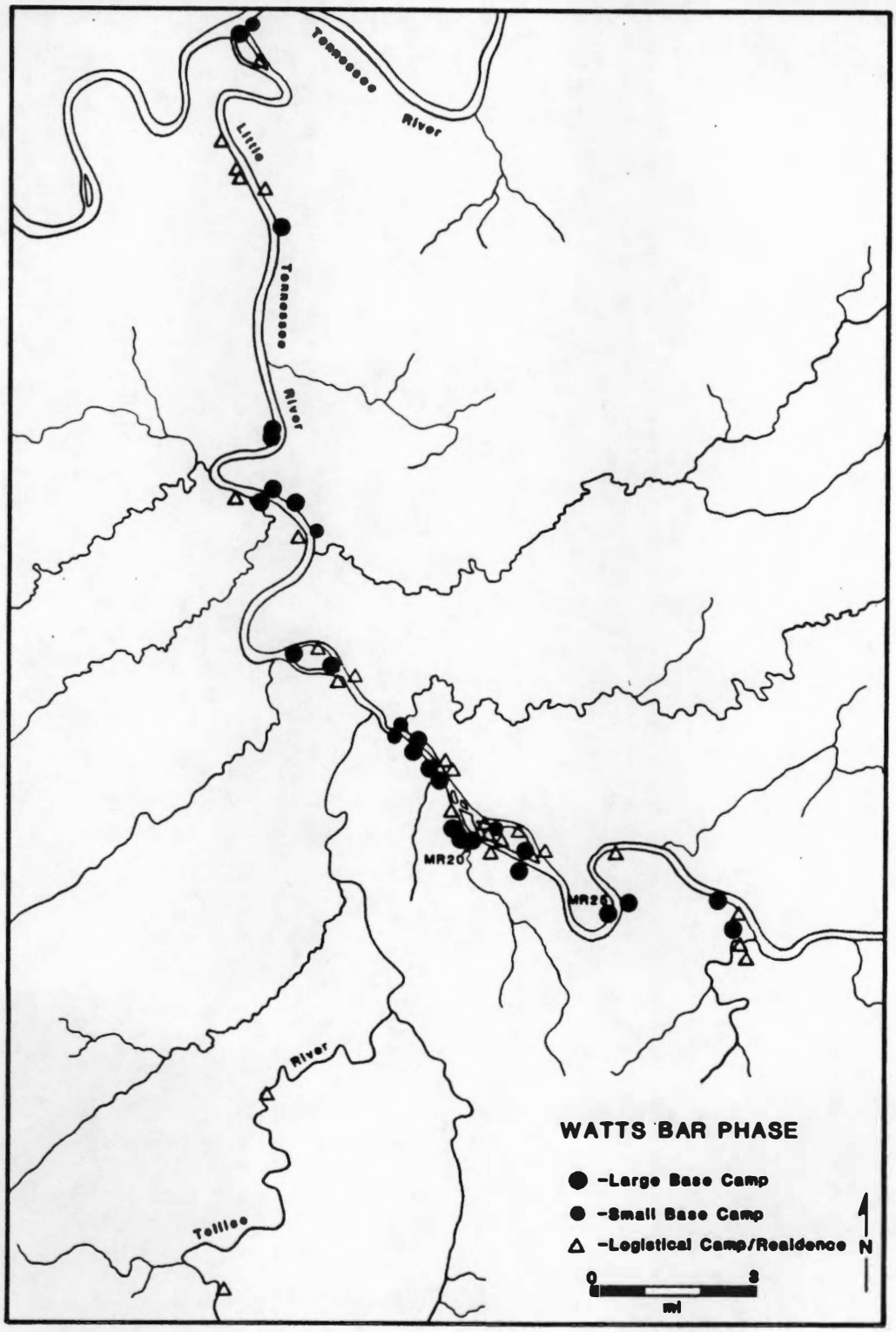


Figure 51. Location of Watts Bar phase sites.

netsinkers led Salo (1969:135) to speculate that the site served primarily as a fishing camp. Although it is difficult to ascertain the exact provenience of artifacts recovered during the 1967 excavations, the lithic assemblage was apparently comprised of stemmed projectile points, utilized flakes, only a small number of other flake tools, slate gorgets, and ground-stone axe and chisel fragments.

Evidence for the Watts Bar component at the Bacon Bend site is equally limited. An area approximately 1,000 ft^2 in size was excavated at this site, exposing a deeply buried midden (Stratum 5) along the front edge of the first terrace. This zone contained abundant lithic artifacts, potsherds, and fire-cracked rock. Lithic artifacts included stemmed and stemless projectile points, utilized flakes, biface fragments, netsinkers, hammerstones, slate gorgets, a pestle, abraders, and numerous debitage. Three basin-shaped fire pits were also recorded in association with this occupation.

Because of the small areas sampled at each site, very little can be concluded about site structure and activities represented at large Watts Bar base camps. Although features were neither abundant nor spatially concentrated, the density of fire-cracked rock and other artifactual debris within the Watts Bar stratum at each site indicate intensive domestic activities. The kinds of artifacts recovered indicate that stone tool fabrication and replacement, fishing, food processing and preparation, and hide-working were probably major activities at these sites. It is probable that site occupations were seasonal and repetitive rather than continuous since most sites would have been subject to periodic flooding. It can be further suggested,

given available information, that Iddins and Watts Bar phase base camps represent essentially similar kinds of site use. This is supported by the spatial distribution of these sites within the study area.

Only five Watts Bar components were classified as probable small base camps. These sites were similar to large base camps with respect to both landform distribution and location along the Little Tennessee River. The small number of Watts Bar potsherds recovered from these sites, and permitting their classification as small base camps, probably relates more to the limited amount of fieldwork conducted rather than any functional difference.

Twenty-five Watts Bar components, classified as probable logistical camps/residences, produced very small numbers of diagnostic potsherds. Logistical camps/residences occurred on first, second, and older terraces of the Little Tennessee River and along Tellico River. The majority, however, were situated along the front edge of the first terrace and displayed a spatial pattern similar to other Watts Bar sites. Most of these sites were identified solely by surface reconnaissance. As a consequence, their low artifact densities are at least partially a product of sampling bias.

In summary, numerous Early Woodland sites were recorded within the study area. Because these sites were identified almost entirely by the presence of pottery (i.e., domestic-related refuse), all are interpreted as being residential camps. Although this interpretation appears to be reasonable for most of these sites, it is possible that some of the smaller sites (classified as logistical camps/residences)

may reflect more ephemeral kinds of activities, perhaps associated with resource procurement by smaller family or task-specific groups, or with individual family residences. Overall, the spatial distribution of Watts Bar sites indicates a strong riverine focus similar to that inferred for the preceding Iddins phase. Similarities between these two phases are also postulated for sites representing non-residential activities.

Middle Woodland Period

One hundred forty-nine components were identified that could be attributed to cultural phases of the Middle Woodland period (200 B.C.-A.D. 600). Although sites were recorded on all major landforms except tributary valleys, most were situated on alluvial terraces of the Little Tennessee River. Middle Woodland sites were classified into four types as follows: large base camp (>20 potsherds recovered or archaeological features observed); small base camp (>5-20 potsherds recovered); logistical camp/residence (1-5 potsherds recovered); and logistical camp/activity locus (only projectile points recovered). As has been noted earlier for Late Archaic and Early Woodland settlement patterns, size distinctions among base camp and residential site categories can be greatly effected by differences in artifact recovery (e.g., survey, testing, excavation) and therefore do not necessarily imply differences in site function. Despite this, these categories are considered useful in exploring the possibility of functional differences among sites.

Site distributions by landform for the Patrick and Icehouse

Bottom phases are provided in Tables 86-87. Maps locating these sites are provided in Figures 52-53.

Patrick Phase. Early Middle Woodland Patrick phase (200 B.C.-A.D. 350) occupations were recognized at 62 sites within the study area and occurred on all landforms except along the Little Tennessee River valley slope and within tributary valleys (Table 86). Patrick sites were distributed along the entire length of the Little Tennessee River valley and only rarely occurred along Tellico River.

Seventeen sites were classified as large base camps. Eleven of these were sampled by excavation, and include the Patrick (40MR40), Calloway Island (40MR41), and Rose Island (40MR44) sites which produced substantial information about Patrick base camp assemblage content and associated features. All three sites were situated on islands (T-1 Terrace) within the Little Tennessee River.

Investigations of the Patrick phase component at Rose Island were the most limited, being confined to test pits covering only about 400 ft^2 of the site. Chapman (1975:56) estimated the overall size of the Woodland occupation at this site to be approximately 250x150 ft. Patrick phase occupational debris was concentrated within a sub-plowzone midden (Stratum II) containing numerous lithic artifacts, pottery, fire-cracked rock, and features. Artifacts included projectile points, bifaces, drills, scrapers, pièces esquillées, other ad hoc flake tools, debitage, celts, axes, hammerstones, pitted cobbles, gorgets, a pestle, and a chopper/scraper, and reflect a diverse range of site activities. Features consisted of pits, fire basins, rock-filled basins, and four tightly flexed human burials

Table 86. Distribution of Patrick phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	13	76.5	4	50.0	21	80.8	2	18.2	40	64.5
T-2 Terrace	2	11.7	4	50.0	2	7.7	0	0.0	8	12.9
>T-2 Terrace	1	5.9	0	0.0	1	3.8	1	9.1	3	4.8
LTRV Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tellico Valley	0	0.0	0	0.0	1	3.8	1	9.1	2	3.2
Tellico Slope	0	0.0	0	0.0	0	0.0	2	18.2	2	3.2
Tributary Valley	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Slope	1	5.9	0	0.0	0	0.0	2	18.2	3	4.8
Upland	0	0.0	0	0.0	1	3.8	3	27.3	4	6.5
Total	17	100.0	8	100.0	26	99.9	11	100.1	62	99.9

Site Types: A - Large Base Camp
B - Small Base Camp
C - Logistical Camp/Residence
D - Logistical Camp/Activity Locus

Table 87. Distribution of Icehouse Bottom phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	11	52.4	3	42.8	35	81.4	4	25.0	53	60.9
T-2 Terrace	6	28.6	1	14.3	4	9.3	1	6.3	12	13.8
>T-2 Terrace	3	14.3	2	28.6	1	2.3	3	18.7	9	10.3
LTRV Slope	0	0.0	0	0.0	0	0.0	1	6.3	1	1.1
Tellico Valley	1	4.7	1	14.3	1	2.3	3	18.7	6	6.9
Tellico Slope	0	0.0	0	0.0	0	0.0	1	6.3	1	1.1
Tributary Valley	0	0.0	0	0.0	0	0.0	0	0	0	0.0
Tributary Slope	0	0.0	0	0.0	2	4.7	2	12.5	4	4.6
Upland	0	0.0	0	0.0	0	0.0	1	6.3	1	1.1
Total	21	100.0	7	100.0	43	100.0	16	100.1	87	99.8

Site Types: A - Large Base Camp
B - Small Base Camp
C - Logistical Camp/Residence
D - Logistical Camp/Activity Locus

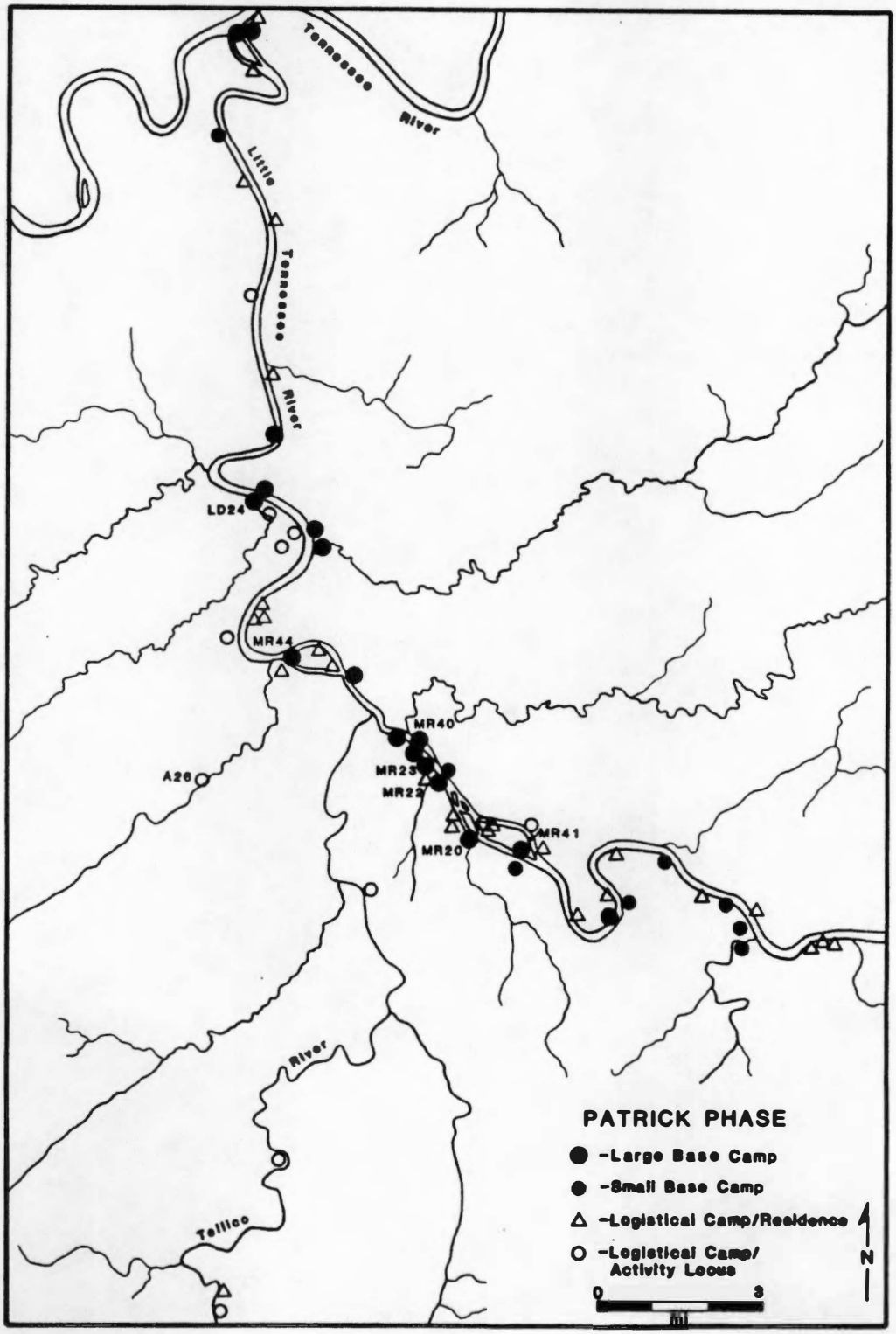


Figure 52. Location of Patrick phase sites.

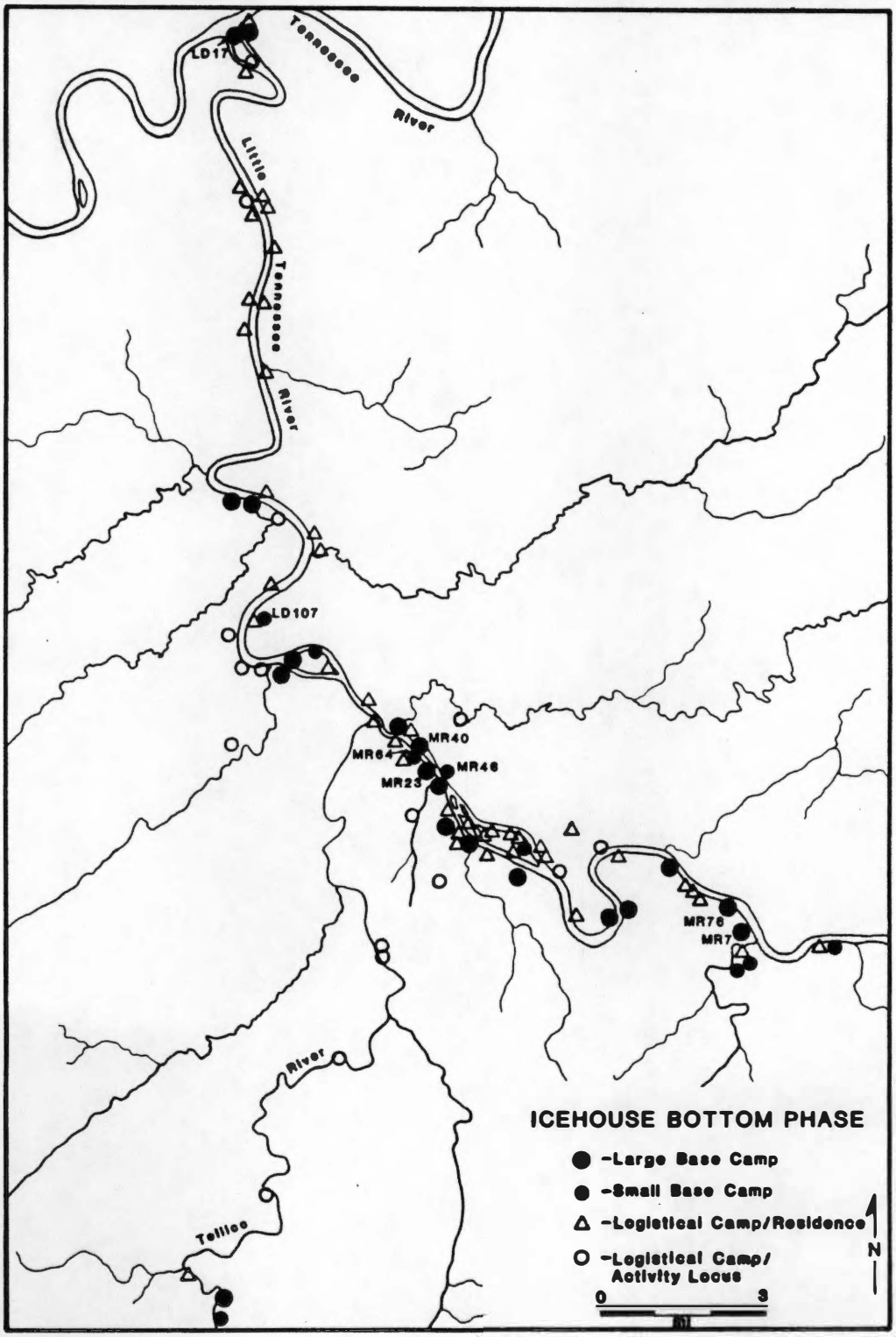


Figure 53. Location of Icehouse Bottom phase sites.

placed in deep circular pits. Several postholes were observed but no structure patterns were discernible.

Similar remains were discovered within Strata I-II at the Calloway Island site (Chapman 1979). Although a substantial area (ca. 2,000 ft^2) was excavated and numerous postholes were identified, no houses could be recognized. However, the remnants of two hearths within Stratum II led Chapman (1979:94, 124-125) to hypothesize the possible existence of structures at these locations. Features observed at Calloway Island but not recognized at Rose Island included one human cremation and at least three deep, cylindrical to bell-shaped, storage pits.

Whereas the Patrick phase investigations at Rose Island and Calloway Island were incidental to the sampling of stratified Archaic cultural deposits at those sites, the early Middle Woodland occupation was the focus of excavation at the Patrick site (Schroedl 1978b). These excavations covered approximately 1,600 ft^2 and exposed Patrick phase remains within Strata 3-11. Two separate Patrick occupations, identified by varying frequencies of pottery types, were delineated. Aside from pottery, no other appreciable differences in artifact assemblage composition or features were recognized.

Both occupations were characterized by extremely dense accumulations of habitation refuse and exhibited a greater range of artifacts and features than was observed at the other two Patrick phase sites. Features included hearths, charcoal concentrations, charcoal-filled depressions or basins, large shallow pits or ovens with burned interiors and containing fire-cracked river cobbles and

burnt limestone, fire-cracked rock and cobble pavements, refuse-filled pits, stratified (storage ?) pits, and human burials. As with the other two sites, no houses were detected despite numerous postholes. In addition to pottery (n>50,000 potsherds), large numbers of lithic tools and debitage were also recovered. Chipped-stone tools associated with the Patrick phase occupations included projectile points, bifaces/preforms, bifacial knives, end scrapers, drills, gravers, perforators, spokeshaves, denticulates, pièces esquillées, and utilized flakes. Large cobble and spall tools included celts, netsinkers, chipped hoes, hammerstones, pitted cobbles, abraders, manos, and pestles. In addition, several gorgets/pendants and a few worked bone tools were also recovered.

Collectively, these three large Patrick base camps reflect intensive site occupations of a magnitude which far exceeded earlier Woodland and Archaic base camp occupations. While these sites probably do not represent permanent settlements, they apparently reflect substantially longer periods of habitation by larger groups of people. Specifically, evidence for increased sedentism consists of the proliferation of pottery, an abundance of postholes indicating the construction of more substantial houses and other above-ground facilities, greater complexity of intrasite structure, and the appearance of storage pits. The presence of subterranean storage facilities may suggest either the employment of a strategy for extending the use of certain food resources beyond their normal period of availability, or a strategy for concealing personal belongings during periods of site abandonment. Greater residential population

size is suggested both by the high density of artifacts and features, and by a substantial increase in the number of human burials.

Whether or not these site characteristics can be extended to other Patrick components interpreted as base camps is uncertain. Although several of the other excavated sites classified as large base camps (e.g., Bat Creek - 40LD24, Martin Farm - 40MR20, and Icehouse Bottom - 40MR23) lacked substantial evidence of Patrick phase features this may reflect either less intense occupations or sampling bias. In the absence of better data from a wider range of Patrick phase sites, it seems equally possible that the Rose Island, Calloway Island, and Patrick sites may represent: 1) large aggregated settlements occupied simultaneously with smaller "hamlets"; 2) large aggregated settlements from which small family groups seasonally dispersed to small habitation sites; or 3) functionally similar habitation sites distinguished solely by a greater number of re-occupations.

Eight Patrick components were classified as small base camps. Seven of these sites were sampled by excavation and appear to represent small habitation sites. All were located along the Little Tennessee River and were equally distributed on the first and second alluvial terraces.

Twenty-six sites contained 1-5 diagnostic potsherds and were classified as probable logistical camps/residences. Of these, 20 were identified entirely by surface reconnaissance. Though some of these sites may reflect more specialized activities associated with resource procurement, most probably represent poorly sampled base camps. Over 80% (n=21) were located along the first terrace of the Little

Tennessee River. The remainder occurred on the second and older terraces, along Tellico River, and within the uplands. The one upland site (40MR22) was located at the edge of the Little Tennessee River valley in the vicinity of several large Patrick base camps.

Finally, 11 sites with Patrick phase projectile points but lacking pottery were classified as probable logistical camps/activity loci. One of these sites (A26) yielded two Greeneville projectile points while the others were identified by single points occurring with other lithic artifacts and debitage. Given the absence of pottery, these sites are thought to represent hunting camps or more limited activity loci associated with hunting. A general non-residential site function is also supported by the spatial pattern of these sites. Patrick phase logistical camps/activity loci were evenly distributed along the first and older terraces of the Little Tennessee River, along the Tellico River valley and valley slopes, along tributary valley slopes, and within the uplands.

Icehouse Bottom Phase. Icehouse Bottom phase (A.D. 350-600) components were identified at 87 sites within the study area and were classified into one of four site categories based on diagnostic artifact content and density (Table 87). Components occurred on all landforms except along tributary valleys; however, most (85%) were situated within the Little Tennessee River valley with over half of these being located between Citico Creek and the mouth of Tellico River (Figure 53).

Twenty-one Icehouse Bottom phase sites contained high densities of diagnostic pottery and were classified as large base camps.

Excavations at about half of these also produced some evidence of cultural features. A majority of the large base camps identified in the site sample were situated near the front edge of the first terrace; however, several sites also occurred on second and older terraces of the Little Tennessee River. A single site was situated along Tellico River at the southernmost end of the study area. Large base camps were particularly concentrated between Citico Creek and Tellico River and were absent along the lower valley between Bat Creek and Bussell Island.

Icehouse Bottom phase components were especially well represented within artifact samples excavated from the Icehouse Bottom (40MR23), Jones Ferry (40MR76), Patrick (40MR40), Citico (40MR7), and possibly Bussell Island (40LD17) sites. At Icehouse Bottom, situated at the front edge of the first terrace, evidence for the Middle Woodland occupation was contained within a sub-plowzone midden (Stratum II) that ranged from 1.0-1.5 ft in thickness. Microstratigraphic analysis of these sediments suggested that at least 7-8 separate living surfaces were represented (Cridlebaugh 1981:15). Aside from deep testing to sample buried Early and Middle Archaic strata (Chapman 1977), three separate excavations were undertaken to investigate the Icehouse Bottom phase occupation (Chapman 1973; Cridlebaugh 1981; Gleeson 1970). These excavations sampled over 4,200 ft^2 of the site.

The high density of artifacts and cultural features, along with the microstratigraphic data, indicate that the site experienced repeated and intensive use during the Icehouse Bottom phase. The artifact assemblage was similar to earlier Patrick phase assemblages

in that it contained abundant amounts of pottery and debitage as well as a diverse range of lithic tools. The chipped-stone tool assemblage included projectile points, bifaces, preforms, knives, various flake tools, pièces esquillées, and prismatic blades. Large cobble and spall implements consisted of hammerstones, abraders, anvil stones, pitted cobbles, celts, netsinkers, and digging implements. Several features were also recorded and consisted primarily of globular pits, straight-sided pits, rock-filled pits, shallow basins, and surface concentrations of rocks and sherds. While postholes were slightly more numerous than at earlier Patrick phase sites, no house patterns could be defined.

As with the three Patrick phase sites discussed earlier, the Icehouse Bottom site appears to represent a semi-permanent residential site. Greater intensity in site use is also supported by analyses of paleobotanical remains related to incipient agriculture and anthropogenic effects on the immediate site environment. The well documented occurrence of maize from Icehouse Bottom phase contexts implies that the site inhabitants were actively engaged in agricultural pursuits within the site vicinity (Cridlebaugh 1981:174). Coinciding with the appearance of maize, the wood charcoal spectrum recovered from Icehouse Bottom also indicates progressive disruption of the bottomland habitat during this period. According to Cridlebaugh (1981:175),

> Regardless of Middle Woodland exploitation motivations, the wood charcoal paleobotanical data indicate an increase in disturbed upland and bottomland (cane) habitats with exploitation of disturbed upland habitats followed in importance by mesic upland and xeric upland environments at the Icehouse Bottom locality. Minor representation of bottomland arboreal species may indicate a depleted arboreal population due to overexploitation and disturbance by man at the site.

Whether or not the Icehouse Bottom site is generally typical of other Middle Woodland base camps remains to be demonstrated. Evidence for extra-regional interaction, including Hopewellian pottery, prismatic blades made of Flint Ridge chalcedony, and pieces of cut mica, was observed only at Icehouse Bottom and suggests that this site may be unique. However, the degree to which such interaction may have effected settlement patterning within the lower Little Tennessee River valley is unknown.

Despite the intensity of archaeological investigations at the Icehouse Bottom site, no evidence for mortuary practices was obtained. Other Icehouse Bottom phase components sampled through excavation (e.g., 40MR7, 40MR40, and 40MR76) also failed to produce any burial remains. This contrasts sharply with the preceding Patrick phase for which numerous human burials were recorded at large base camp sites, and indicates a distinctly different mortuary pattern. Chapman (1973:39) speculated that the mortuary practices of the Icehouse Bottom phase "may have involved burial mounds along the neighboring ridges." Such upland mound sites have only recently been investigated.

Two major types of burial mounds were reported by early surveys of the valley conducted by the Smithsonian Institution (Thomas 1894), most of which are now destroyed. The most conspicuous were conical earthen mounds. A majority of these mounds were apparently situated within the uplands overlooking the Little Tennessee River and Tellico River valleys and on older terraces near the back edge of the Little Tennessee River valley. Information obtained from archaeological

testing at the Pate Mound (40MR16) suggest that these earthen mounds may be associated largely with the Early Mississippian period, an interpretation that is consistent with present ideas about the Hamilton burial mound complex in East Tennessee (see Schroedl 1978a). Although no diagnostic artifacts were recovered, a single radiocarbon date of A.D. 1111±119 years was obtained (Davis et al. 1982:546-556).

In addition to earthen mounds, numerous "rock graves" were also reported within the uplands adjacent to the Little Tennessee River valley (see letters from John Emmert to Cyrus Thomas [Smithsonian Institution] dated 1/22/85, 5/13/85, 12/21/86, 2/23/89, and 2/25/89; copies on file at the Frank H. McClung Museum, University of Tennessee, Knoxville). One of these stone mounds, situated on Wear Bend, was excavated by the Smithsonian Institution but produced no culturally diagnostic material (see Emmert letter - 3/7/89 and James Middleton letter - n.d.). During a recent reconnaissance of an upland tract located along the west side of Tellico Lake between Bat Creek and Fork Creek, another stone mound (Kittrell Mound - 40LD183) was identified and tested (Jefferson Chapman, personal communication 1985). This mound was situated along a ridge approximately one mile back from the Little Tennessee River valley. Although diagnostic artifacts were again absent, human remains were observed. In addition, two radiocarbon samples were collected and produced dates of A.D. 485±175 years (GX-11436) and A.D. 655±90 years (GX-11435). Given this limited evidence, it is suggested that mortuary activities during the Icehouse Bottom phase probably were conducted away from base camps at special-purpose sites dispersed within the uplands near the valley

edge and atop upland ridges, and consisted of interment within small stone-capped graves.

Seven Icehouse Bottom components were classified as small base camps. Six of these were located within the Little Tennessee River valley above Wear Bend. The other was located along Tellico River. Three sites--40LD107, 40MR46, and 40MR64--were sampled by test excavations and apparently represent only limited habitations.

Almost half (n=43) of all Icehouse Bottom phase sites produced only 1-5 diagnostic potsherds and were classified as probable logistical camps/residences. As with similar sites identified for the Patrick phase, a majority of these likely represent poorly sampled base camp sites. Eight of these sites were subjected to limited testing while the remainder were only surface collected. Over 80% of these sites were located along the first terrace of the Little Tennessee River and were the dominant site class occurring below Rose Island.

Finally, 16 sites, classified as probable logistical camps/activity loci, produced only small numbers ($n \leq 2$) of diagnostic projectile points. These sites were more widely distributed within the study area and occurred on all landforms except along tributary valleys. This spatial pattern, along with an apparent absence of pottery, indicates a non-residential function for these sites. Most were probably associated with hunting activities.

Summary. With the exception of mortuary patterns and evidence for extra-regional interaction, the archaeological records and settlement patterns of the Patrick and Icehouse Bottom phases are

essentially similar. Both display a pattern of intense focalization of residential activities along the lower terraces of the Little Tennessee River with only limited utilization of the Tellico River drainage. While this general spatial pattern can be traced back to the Early Woodland period, both Patrick and Icehouse Bottom phase base camps reflect substantially greater residential activity and imply a higher degree of sedentism as well as greater residential population size. The apparent diversity in site size, if not wholly a product of sampling bias or differences in site re-occupation, may evidence the beginning of residential site hierarchies that characterize the subsequent Mississippian period.

Early Mississippian Period

The Early Mississippian period within the lower Little Tennessee River valley is represented by the Martin Farm (A.D. 900-1000) and Hiwassee Island (A.D. 1000-1300) phases. Fifty-nine cultural components were identified that could be assigned to these phases. These include 14 mortuary sites (i.e., conical burial mounds and mound clusters) that probably date to the Early Mississippian period but cannot be associated with a particular phase. Several additional sites containing non-diagnostic Mississippian pottery and projectile points are probably also attributable to the Early Mississippian period.

Four general types of Early Mississippian sites were recognized based upon potsherd densities and the observation of archaeological features. These are defined as follows: center (>20 potsherds recovered or archaeological features and structures observed, and

possible substructure mounds present); hamlet (>5-20 potsherds recovered or archaeological features and structures observed; substructure mounds absent); homestead (1-5 potsherds recovered); and mortuary site (conical earthen mound identified). Several additional sites classified as general Mississippian homesteads (1-5 non-diagnostic Mississippian potsherds recovered), logistical camps (2-10 projectile points recovered; pottery absent), and activity loci (isolated projectile point finds) probably also have an Early Mississippian cultural association. Centers, hamlets, and homesteads are considered to represent components of a residential system possessing a hierarchical structure which became progressively more pronounced through time (see Chapter II).

Distributions of Early Mississippian and general Mississippian sites by landform are provided in Tables 88-90. The spatial patterns of these sites, with the exception of mortuary sites, are mapped in Figures 54-56.

Eighty-seven general Mississippian sites were recorded that are affiliated with either the Martin Farm, Hiwassee Island, Dallas, or Overhill phases. Twenty-eight of these were identified by small numbers of Mississippian potsherds and were classified as probable homesteads. Like other Mississippian homesteads recognized within phase-specific site inventories, these sites occurred primarily along the first terrace of the Little Tennessee River and only rarely occurred on older terraces and along Tellico River. The remaining sites were defined solely by the presence of small triangular projectile points and were interpreted as probable temporary camps

Table 88. Distribution of general Mississippian period sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	Total n	Total %
T-1 Terrace	24	85.7	3	21.4	7	15.6	34	39.1
T-2 Terrace	1	3.6	0	0.0	1	2.2	2	2.3
>T-2 Terrace	2	7.1	4	28.6	4	8.9	10	11.5
LTRV Slope	0	0.0	1	7.1	5	11.1	6	6.9
Tellico Valley	1	3.6	2	14.3	4	8.9	7	8.1
Tellico Slope	0	0.0	2	14.3	1	2.2	3	3.4
Tributary Valley	0	0.0	2	14.3	5	11.1	7	8.1
Tributary Slope	0	0.0	0	0.0	5	11.1	5	5.7
Upland	0	0.0	0	0.0	13	28.9	13	14.9
Total	28	100.0	14	100.0	45	100.0	87	100.0

Site Types: A - Homestead
B - Logistical Camp
C - Activity Locus

Table 89. Distribution of Martin Farm phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	Total n	Total %
T-1 Terrace	2	66.7	5	55.6	5	100.0	12	70.6
T-2 Terrace	1	33.3	2	22.2	0	0.0	3	17.6
>T-2 Terrace	0	0.0	1	11.1	0	0.0	1	5.9
LTRV Slope	0	0.0	0	0.0	0	0.0	0	0.0
Tellico Valley	0	0.0	0	0.0	0	0.0	0	0.0
Tellico Slope	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Valley	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Slope	0	0.0	1	11.1	0	0.0	1	5.9
Upland	0	0.0	0	0	0	0.0	0	0.0
Total	3	100.0	9	100.0	5	100.0	17	100.0

Site Types: A - Center
B - Hamlet
C - Homestead

Table 90. Distribution of Hiwassee Island phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	D n	D %	Total n	Total %
T-1 Terrace	3	60.0	3	27.3	6	50.0	0	0.0	12	28.6
T-2 Terrace	2	40.0	4	36.4	3	25.0	1	7.1	10	23.8
>T-2 Terrace	0	0.0	3	27.3	2	16.7	5	35.7	10	23.8
LTRV Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0
Tellico Valley	0	0.0	1	9.1	0	0.0	1	7.1	2	4.7
Tellico Slope	0	0.0	0	0.0	0	0.0	0	0.0	0	0
Tributary Valley	0	0.0	0	0.0	0	0.0	1	7.1	1	2.4
Tributary Slope	0	0.0	0	0.0	1	8.3	0	0.0	1	2.4
Upland	0	0.0	0	0.0	0	0.0	6	42.9	6	14.3
Total	5	100.0	11	100.1	12	100	14	99.9	42	100.0

Site Types: A - Center
B - Hamlet
C - Homestead
D - Mortuary Site (General Early Mississippian ?)

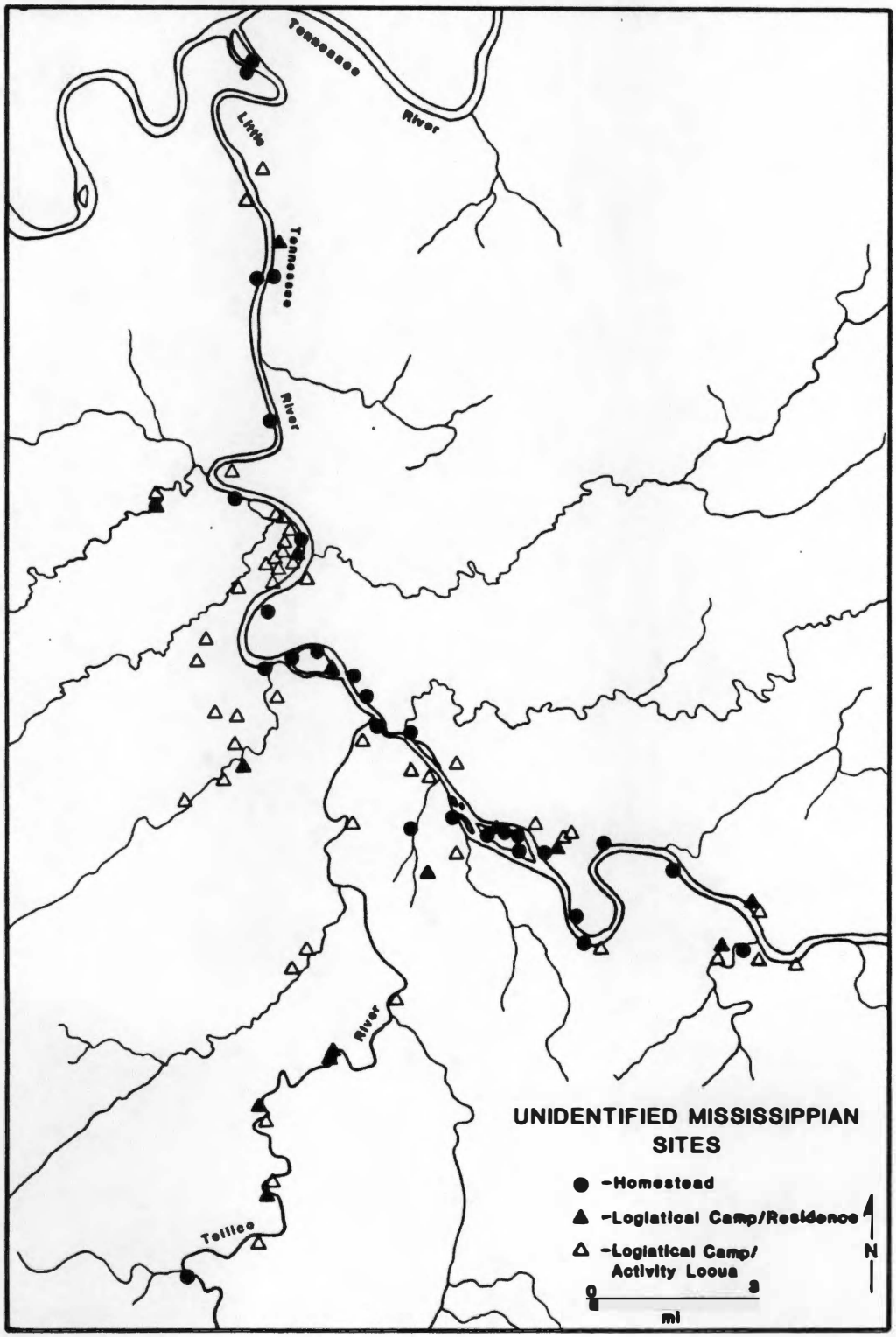


Figure 54. Location of general Mississippian period sites.

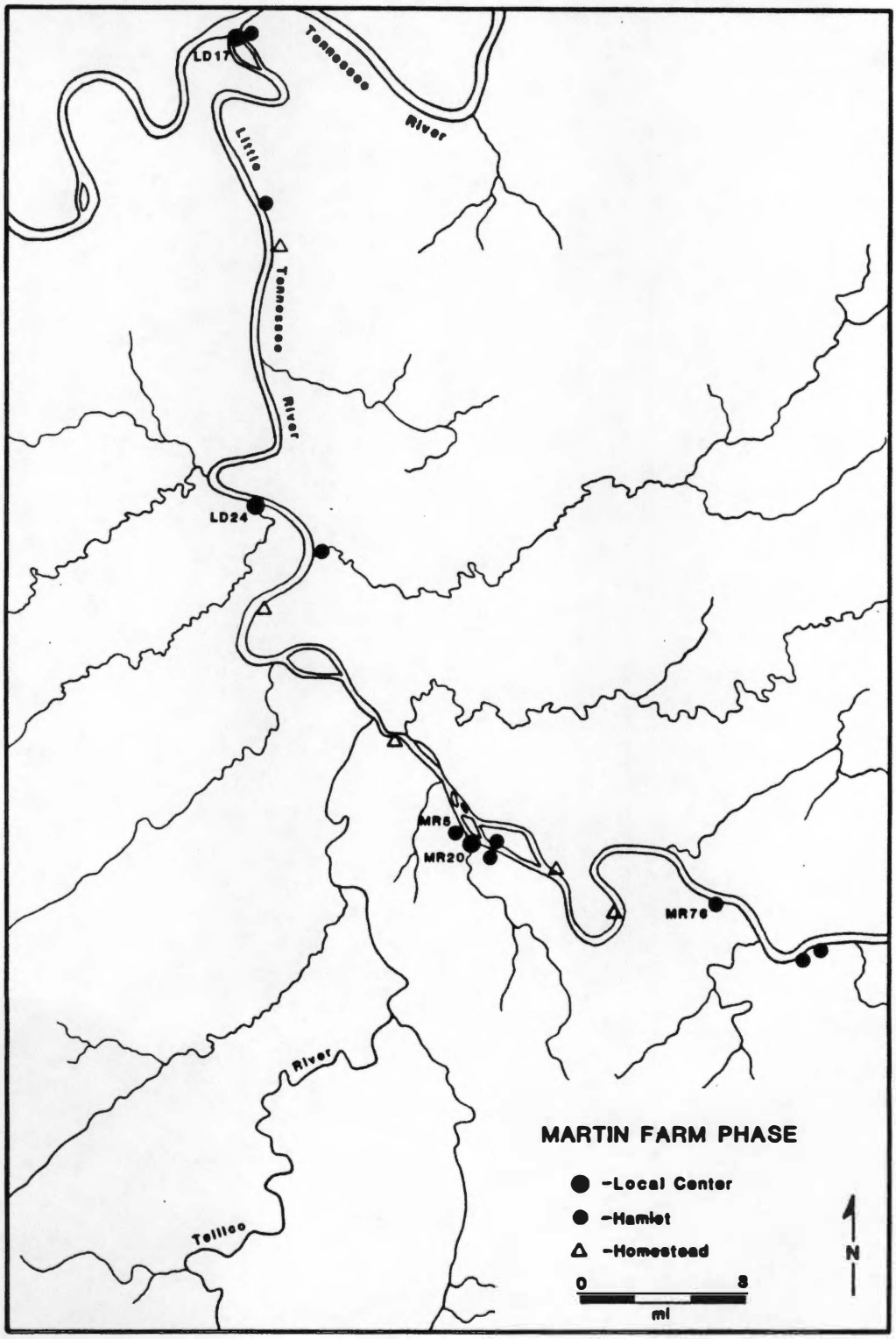


Figure 55. Location of Martin Farm phase sites.

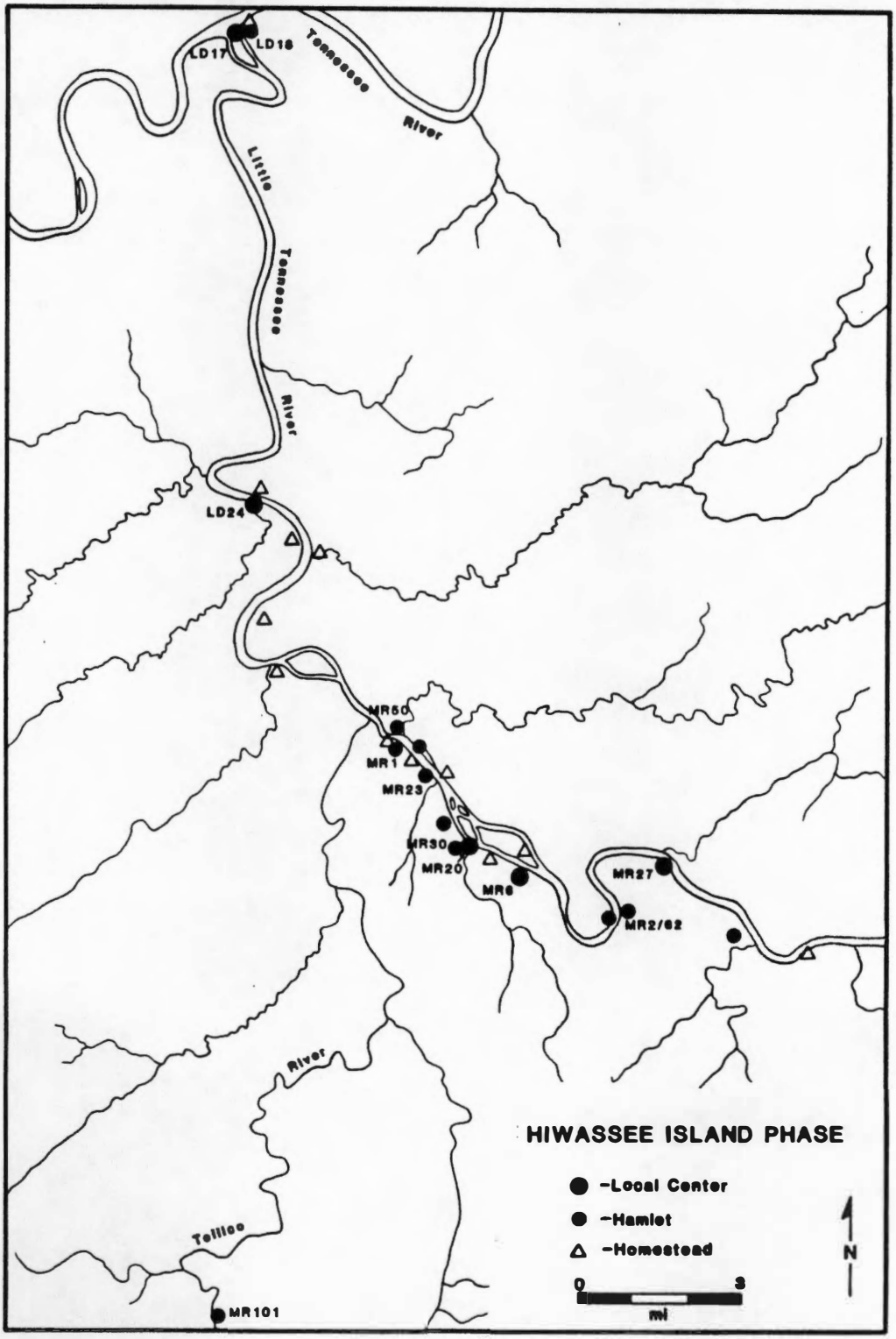


Figure 56. Location of Hiwassee Island phase sites.

(i.e., logistical sites) and activity loci associated primarily with hunting. Logistical sites (n=14) occurred along the first terrace, older terraces and adjacent valley slopes, along Tellico River valley and valley slopes, and along tributary valleys. Activity loci (n=45) were more numerous and were fairly evenly distributed throughout the study area.

Martin Farm Phase. The Martin Farm phase was poorly represented within the Tellico site inventory. Only 17 components were identified, a situation that reflects both the short time span (ca. 100 years) estimated for this phase and the methodological difficulty in recognizing these components using small sherd samples. It is suspected that a detailed reanalysis of extant potsherd collections recovered from earlier site surveys and test excavations, focusing upon particular attributes of rim form and cordage twist on limestone-tempered cordmarked sherds, would permit the detection of several additional Martin Farm phase components (see Schroedl et al. 1985:157-165). With the exception of a single site situated at the lower end of Baker Creek valley, all Martin Farm phase sites were located within the Little Tennessee River valley.

Three Martin Farm sites (Martin Farm - 40MR20; Bussell Island - 40LD17; and Bat Creek - 40LD24) were classified as probable incipient centers. These sites, situated along the first and second terraces of the Little Tennessee River at River Miles 0.1, 12.1, and 22.2, were widely separated from one another, and each exhibited evidence of major site occupations during the subsequent Hiwassee Island phase. Martin Farm occupations at the Bussell Island and Bat Creek sites were

recognized only through cursory examinations of excavated sherd samples. Consequently, their interpretation as incipient centers is based largely upon circumstantial evidence. Neither cultural component was recognized during initial site investigations and excavation controls were too gross to permit sufficiently detailed site reconstructions (see Chapman 1982; Schroedl 1975). However, given the occurrence of substructure mounds dating to later Hiwassee Island and Dallas phases and the presence of Martin Farm ceramics within the pre-mound humus zone at Bat Creek, it seems quite possible that initial mound construction at each site may have begun during the Martin Farm phase.

Conversely, sufficient artifact samples and observations about associated features and architectural remains were obtained from the Martin Farm site. These data allow certain general statements to be made about the archaeological composition of Martin Farm phase residential sites and permit the recognition of emerging local centers during this cultural phase. Unfortunately, the scale of excavation was too small to provide any detailed observations about intra-settlement plan.

The Martin Farm site was situated on a narrow, 300-ft wide peninsula formed by the confluence of Toqua Creek and the Little Tennessee River. Excavations of the Early Mississippian contexts, contained within stratified midden and alluvial deposits at the base of plowzone, were undertaken between 1967 and 1975 and exposed over 5,000 ft^2 of the site (Schroedl et al. 1985). The predominant site occupation occurred during the Hiwassee Island phase. Archaeological

remains associated with the Martin Farm phase included at least four structures with associated features (mostly hearths and shallow refuse-filled pits), one human burial, a large ditch-like feature (Feature 7), and initial construction phases of at least one substructure platform mound (Mound 1). Houses were rectangular, measured from 16-22 ft on a side, and were of both wall-trench and single-post construction. The spatial arrangement of these architectural features and similarity of house alignments to later Hiwassee Island phase structures suggest a level of community planning not evident at earlier residential sites. The continuity in house alignments representing the two Early Mississippian phases, coupled with similarities in artifact assemblages and multiple overlapping structures associated with the Hiwassee Island phase, indicate further that the site probably was continuously occupied. Given the density and wider spatial distribution of Hiwassee Island phase remains, this settlement appears to have experienced substantial population growth following the Martin Farm phase.

Nine Martin Farm components were classified as probable hamlets. A majority of these sites were situated along the first terrace of the Little Tennessee River while the remainder occurred along second and older terraces, and along Baker Creek near its confluence with the Little Tennessee River. Three of these sites were partially excavated. Archaeological features, consisting of large, deep, bell-shaped storage pits, were sampled at the Tomotley (40MR5) and Jones Ferry (40MR76) sites. Although numerous artifacts were recovered (see Schroedl et al. 1985), no evidence of associated

structures and intra-settlement plan was recovered. The density of cultural remains within these contexts suggest that the sites probably represent settlements larger than a single household. A cemetery containing at least six graves was also discovered at the Tomotley site and may be attributable to the Martin Farm phase (Glassman 1983). If so, then it indicates a more complex pattern of mortuary treatment than simply mound burial.

Finally, five Martin Farm components recognized by only small numbers of diagnostic potsherds were classified as probable homesteads. All were situated near the front edge of the first terrace along the Little Tennessee River and apparently represent small settlements of very limited areal extent. Although confirming data are lacking, it is likely that these sites reflect single household residences.

Hiwassee Island Phase. The Hiwassee Island phase occupation within the study area was represented at 28 sites. These sites included local centers, hamlets, and homesteads, and were located almost exclusively within the Little Tennessee River valley. Several Hiwassee Island sites were concentrated in the vicinity of the Martin Farm site, between Bacon Bend and the mouth of Tellico River. Because only a small percentage (6.4%) of potsherds comprising Hiwassee Island ceramic assemblages could be used to recognize components of this phase, the Hiwassee Island site inventory is considered to be vastly under-represented when compared with other Mississippian and Woodland phases.

Five Hiwassee Island sites were classified as local centers. All

represent large, moderately compact settlements, and contained evidence of civic architecture (e.g., one or more substructure mounds) and community planning. Three of these sites (Bussell Island - 40LD17; Martin Farm - 40MR20; and Mayfield II - 40MR27) were situated on the first terrace while the remainder (Bat Creek - 40LD24 and Toqua - 40MR6) were situated on the second terrace. Occupations at both of these latter sites, as well as at Mayfield II, have been interpreted as probable late Hiwassee Island settlements (Polhemus 1983:1572; Schroedl 1975:221-222). Conversely, it is likely that the Early Mississippian community at Martin Farm was largely vacated by A.D. 1200 (Schroedl et al. 1985:460).

At the time of its abandonment, the Hiwassee Island village at Martin Farm probably covered over 10 acres. Whether or not the intensity of occupation was the same over this area is uncertain. Archaeological evidence from the 1967 and 1975 excavations at Martin Farm indicate that the area of most intense occupation, represented by Mounds 1 and 2 and their associated structures, may have gradually migrated from west to east (and away from the mouth of Toqua Creek) during the course of community development. The areal extent of Hiwassee Island phase manifestations further suggests that the settlement may have become more dispersed over time.

The settlement history of the Martin Farm site inhabitants during the latter part of the Hiwassee Island phase may be represented at the Toqua site, located on the second terrace of the Little Tennessee River just east of Martin Farm. Large-scale excavations and controlled surface collections over an 11-acre area, conducted between

1975 and 1977, provided extensive data for interpreting the genesis and subsequent development of this large Dallas phase center. According to Polhemus (1983:1571-1572),

> The initial Mississippian occupation of Toqua began with the construction of widely dispersed Hiwassee Island structures situated along the front edge of the [second] terrace. Such dispersed settlements were probably affiliated with the Hiwassee Island phase Martin Farm site (40MR20) located less than a mile down stream from Toqua. The Toqua site proper was begun shortly after A.D. 1200 with the construction of Phase A-1 of Mound A, the construction of Structures 6 and 42 beneath Mound B, the construction of Structure 60, and the construction of regularly spaced domestic structures, all within Palisade Perimeter A. . . . Only a short period of time is represented by this rather spacious town plan as none of the public buildings, all of flexed construction, show signs of repair or replacement. Flexed building construction, the presence of some wall trenches, and a small number of associated Hiwassee Island Red Filmed and Hiwassee Island Red-on-Buff ceramic sherds suggest a late Hiwassee Island or transitional Hiwassee Island-Dallas affiliation for the initial town plan.

Ample evidence of civic architecture and a regularized village plan was also obtained from archaeological excavations conducted in 1971 at the Bat Creek site (Schroedl 1975). These excavations covered approximately 10,000 ft^2 (ca. 15% of the estimated 3.5-acre site) and exposed portions of sixteen structures, including four rectangular buildings associated with Mound 1, five other rectangular houses of single-post construction, and several linear posthole patterns representing free-standing walls or fences. Several of these fences ran between houses at the eastern edge of the village and apparently served as a palisade (see Schroedl 1975:141). In areas where the excavation was sufficiently large (e.g., Area C), houses were similarly aligned, equally spaced, and surrounded by clusters of

refuse-filled pits suggesting the presence of distinct, well-defined activity areas.

Regarding the developmental sequence of the Hiwassee Island phase village at Bat Creek, Schroedl (1975:278) concluded that the

> Mississippian occupation of the Bat Creek locale probably was initiated with several scattered dwellings constituting a hamlet or loosely organized village. This settlement was established prior to mound construction. It is likely that population growth and accompanying village expansion contributed to the need for constructing a public building and eventually placing a mound over its remains. The placement of dwellings, related structures, and associated features to form distinct village units and activity areas probably occurred simultaneously with population growth.

Unlike Toqua, the Bat Creek village did not evolve into a large Dallas phase center. Instead, the settlement was abandoned, possibly because the amount of bottomlands in the immediate site vicinity became insufficient for the expanding population and developing maize economy.

Eleven Hiwassee Island phase sites were classified as probable hamlets. These sites were characterized by moderate densities of diagnostic potsherds and appear to represent clusters of two or more households. Civic architecture and public buildings are apparently absent at these sites. Six sites (Mainland Village - 40LD18; Fort Loudoun - 40MR1; Chota-Tanasee - 40MR2/62; Icehouse Bottom - 40MR23; McGhee - 40MR30; and Tellico Blockhouse - 40MR50) produced evidence of either domestic architecture or archaeological features and represent either small autonomous communities or, more likely, satellite communities associated with larger local centers. Hiwassee Island phase hamlets were evenly distributed along first, second, and older terraces of the Little Tennessee River, and were concentrated along

the upper portion of the valley between Bacon Bend and the mouth of Tellico River.

A single hamlet (40MR101) was identified along Tellico River at the southernmost end of the study area. Artifact distributions from a controlled surface collection of this site (see Davis et al. 1982:573-574) indicate that this community covered approximately 1.5 acres (ca. 200x300 ft) and may have consisted of 3-4 houses. Because 40MR101 is far removed from other Hiwassee Island phase sites within the study area, it probably is associated with culturally related sites further upstream at Tellico Plains.

Lastly, 12 Hiwassee Island components identified by small numbers of potsherds were classified as probable homesteads. Although the present archaeological data suggest that most of these sites represent single households, some may be components of loosely organized hamlets. Half of these sites were situated on the first terrace of the Little Tennessee River while the rest occurred on second and older alluvial terraces, and near the mouth of Baker Creek. With only two exceptions, all of these sites were located near larger Hiwassee Island phase sites.

Summary. The archaeological record of the Early Mississippian period within the lower Little Tennessee River valley indicates that it was a time of fundamental change in aboriginal settlement. The changes that occurred appear to be associated primarily with shifting economic strategies and increasing socio-cultural complexity, both of which characterized the emergence of the Mississippian cultural expression within the Southeast. Although the settlement system of

the Martin Farm phase can be distinguished from earlier Middle Woodland systems by a greater degree of residential site permanence and a substantially higher level of intrasite complexity (with respect to local centers), the spatial distribution of residential sites relative to landform placement remained virtually unchanged. The overwhelming majority (70.6%) of Martin Farm phase sites were located along the front edge of the first terrace with progressively fewer sites being found on second terraces (17.6%), older terraces (5.9%), and other landforms (5.9%).

Conversely, settlement data for the subsequent Hiwassee Island phase indicate a substantial shift in residence location away from the first terrace (42.9%) to second terrace (32.1%) and older alluvial terrace (17.9%) settings. Other landforms (7.1%) apparently remained of only minor importance. This shift in settlement location was also accompanied by an increase in the number of residential sites as well as the development of significantly larger local centers. Both of these changes suggest that the local population rapidly expanded during the Hiwassee Island phase.

The partial abandonment of the first terrace by Hiwassee Island peoples may be directly related to two factors. First, the establishment of permanent residential sites, begun during the Martin Farm phase, may have required the eventual relocation of many settlements to higher terraces where they would be less effected by seasonal flooding. Archaeological evidence from the Martin Farm site, located on the first terrace, suggests that the site inhabitants

experienced major episodes of flooding during both the Martin Farm and Hiwassee Island phases (Schroedl et al. 1985:44-47).

Second, the developing maize economy evident during the Early Mississippian period would have required increasingly larger areas for agricultural fields as population size increased. Although soils of the second and older alluvial terraces are comparatively rich in terms of agricultural productivity (Elder 1961), the first terrace soils, being comprised of sand and silt loams and subject to periodic flooding, were clearly the richest and most easily tillable. Given these qualities, it seems apparent that a relocation of major settlements away from the first terrace to adjacent landforms would have had definite economic advantages. As will be seen below, the placement of major Dallas phase settlements can be directly related to large expanses of rich alluvial soils.

Late Mississippian Period

The Late Mississippian period (A.D. 1300-1600) in the lower Little Tennessee River valley is represented by the Dallas phase. Dallas phase cultural components were recognized at 27 sites (Table 91). As with the two earlier Mississippian phases, Dallas residential sites were classified using similar criteria as either local centers, hamlets, or homesteads. No specialized Dallas mortuary sites were recorded. Several Dallas homesteads, logistical camps, and activity loci are probably represented within the inventory of sites identified simply as general Mississippian (see Table 88; Figure 54). Late Mississippian sites occurred primarily along the first, second, and

Table 91. Distribution of Dallas phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	Total n	Total %
T-1 Terrace	1	33.3	0	0.0	12	57.1	13	48.1
T-2 Terrace	2	66.7	2	66.7	4	19.0	8	29.6
>T-2 Terrace	0	0.0	1	33.3	4	19.0	5	18.5
LTRV Slope	0	0.0	0	0.0	0	0.0	0	0.0
Tellico Valley	0	0.0	0	0.0	1	4.8	1	3.7
Tellico Slope	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Valley	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Slope	0	0.0	0	0.0	0	0.0	0	0.0
Upland	0	0.0	0	0.0	0	0.0	0	0.0
Total	3	100.0	3	100.0	21	99.9	27	100.0

Site Types: A - Center
B - Hamlet
C - Homestead

older terraces of the Little Tennessee River. A single Dallas phase site was located on Tellico River (Figure 57).

Three sites, representing the remains of large compact villages, were classified as local centers. All were palisaded settlements that covered several acres and contained large platform mounds that supported public buildings. Two of the sites (Bussell Island - 40LD17 and Toqua - 40MR6) also exhibited evidence of smaller, secondary mounds. Although archaeological excavations were conducted at all three sites, substantial data on intra-settlement structure was obtained only at Toqua.

The Citico investigations, conducted in 1967-68, focused upon excavating the mound and provided only limited information about the associated village. Specifically, only two rectangular houses and a portion of the surrounding palisade were recorded within the village area (Salo 1969). Later investigations at this site, conducted by Chapman (1979), focused upon the Overhill phase component and provided little additional information. Polhemus (1983:1599, 1602) has suggested that the Late Mississippian occupation at Citico may represent a very late Dallas phase village. Excavations at Bussell Island, undertaken by the Tennessee Archaeological Society between 1970 and 1974, also failed to contribute much usable data for interpreting intrasite structure (see Chapman 1982).

Excavations at Toqua, conducted between 1975 and 1977, extensively sampled both the two platform mounds and the associated village area, and thus allowed for a relatively detailed reconstruction of the overall settlement plan. These investigations recorded 130

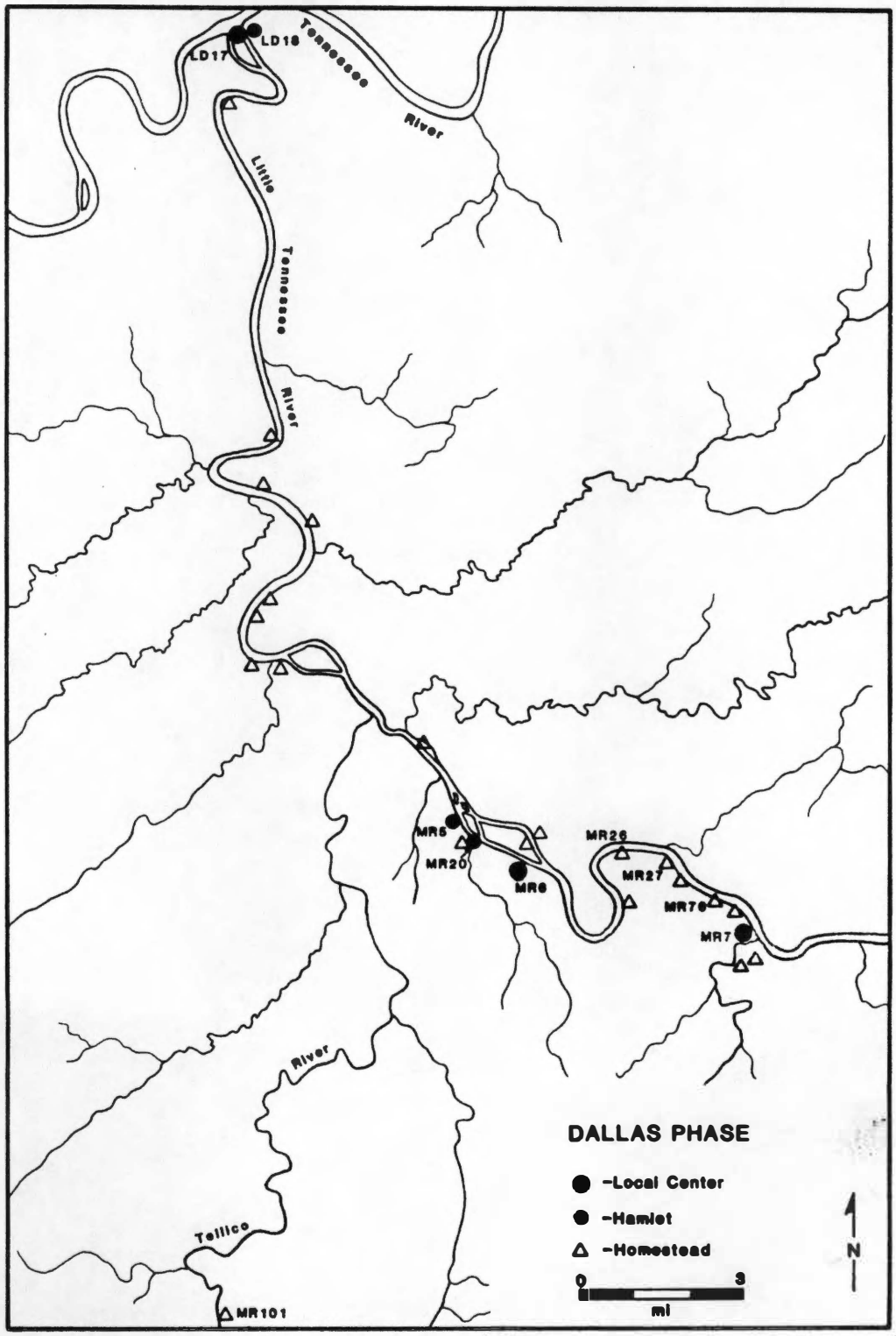


Figure 57. Location of Dallas phase sites.

structures, 620 human burials, and over 1,500 other archaeological features, most of which were associated with the Dallas occupation at the site (Polhemus 1983:1564). In his analysis of the Toqua site data, Polhemus (1983:1571) recognized three major Late Mississippian occupational phases that lasted from about A.D. 1250 to A.D. 1600. During this time, the overall physical size of the village decreased from almost 10 acres to just over four acres. Associated with this decrease was the construction of a more substantial palisade (probably as a defensive structure) and an apparent decline in population during the last occupational phase.

The overall configuration of the settlement, however, remained the same. The entire village was encompassed by a palisade constructed of large vertical timbers with towers and bastions. In the central part of the village was a public area comprised of a large platform mound (Mound A) that faced a broad, open plaza and supported a pair of public buildings. Houses and house clusters surrounded the public area. Houses were of single-post construction, with four central support posts, and were predominantly square in outline. Several houses showed evidence of extensive rebuilding. Interior features included a centrally-placed clay hearth and evidence of partitions or sleeping platforms. Deceased family members were frequently buried in the house floor near the outer wall. Activity areas located immediately outside the house were represented by posthole clusters suggesting small, shed-like structures, storage pits and other subsurface facilities, and fired areas that were probably the remains of outdoor cooking areas (Polhemus 1983:1571-1577).

The Bussell Island, Citico, and Toqua sites are only three of at least 29 Dallas sites with platform mounds that have been reported within the upper Tennessee River drainage (see Polhemus 1983:1601; Rowe 1952). Consequently, these sites represent only a small portion of the overall Dallas settlement system. Polhemus (1983:1599-1602) has suggested that towns or local centers such as Toqua represent

> the basic unit in the Dallas spatial settlement hierarchy rather than Minimal Settlement Units or farmsteads proposed for other Mississippian settlement systems (Smith 1978). . . .
>
> Dallas settlement patterning is characterized by compact towns, frequently situated at relatively close intervals, distributed along major alluvial bottom land systems within the Ridge and Valley physiographic province. Few isolated Minimal Settlement Units [homesteads] or Level II Household Aggregates [hamlets] appear to exist outside of compact Level III towns [local centers].

Contrary to this view, several smaller Dallas phase sites were identified within the study area including three probable hamlets and 21 homesteads. Two of the hamlets (Tomotley - 40MR5 and Martin Farm - 40MR20) appear to be satellite communities associated with the Toqua site while the third hamlet (Mainland Village - 40LD18) was situated on a high alluvial terrace overlooking Bussell Island. Archaeological evidence for a Dallas component at Martin Farm consisted of pottery from the surface and excavated plowzone levels, and at least four human burials (Schroedl et al. 1985).

More substantial Dallas phase remains were excavated along the second terrace at Tomotley (Guthe and Bistline 1978). Excavations here during 1973-74 uncovered approximately 71,200 ft^2 of the site and exposed a loose cluster of 11 separate Dallas houses. The spatial distribution of these structures and associated features, including 56 Dallas burials (many placed beneath house floors) and 44 other pits,

basins, and hearths, indicates a settlement size of at least 1.7 acres (ca. 250x300 ft). Despite the overall size of this site and the extensive area that was excavated, no evidence of a palisade was found.

Finally, the recovery of a moderate amount of Dallas pottery from limited test excavations at the Mainland Village site (Davis et al. 1982:568-573) permitted the identification of this site as a probable hamlet. This interpretation is supported by earlier investigations by Harrington (1922) which uncovered numerous Dallas phase burials. Unfortunately, no data about the intrasite structure of Mainland Village was obtained. The close proximity of this site to the Bussell Island site, a local center, suggests that these two settlements were closely related.

The 21 sites classified as homesteads contained only limited evidence of Dallas phase occupation. The generally low artifact frequencies and small areal extent of these sites indicate a level of residential activity that might be associated with single or related households. Higher artifact densities at two sites—Mayfield I (40MR26) and Mayfield II (40MR27)--suggest that they may represent slightly larger house clusters. Unfortunately, the scale of excavation at each site was insufficient for identifying associated architectural remains (Salo 1969).

A single, and apparently isolated, Dallas house was discovered and excavated during 1979 testing at the Jones Ferry site (40MR76) (Chapman 1980). This square structure, measuring approximately 28 ft on each side and containing a central clay hearth, was similar to

those excavated at Toqua and Tomotley. Two associated human burials were also excavated.

Although the majority (57.1%) of the Dallas homesteads were situated along the first terrace of the Little Tennessee River, several also occurred on other alluvial terraces within the valley. With the exception of seven homesteads that were situated between Rose Island and upper Jackson Bend, these sites tended to cluster near the three local centers and were probably associated with those communities. One possible explanation for the homestead site cluster in the Rose Island to Jackson Bend area is that they actually represent late Hiwassee Island settlements that were associated with the Bat Creek site prior to its abandonment. A single homestead (40MR101) at the upper end of Tellico River was also identified in the site sample. This homestead was probably associated with a large Dallas center situated about four miles upstream at Tellico Plains (see Thomas 1894).

In summary, the Dallas settlement pattern as displayed within the study area represents the culmination of a trend toward population consolidation and settlement nucleation that began during the Martin Farm phase. Although a majority of the Dallas population probably lived within the compact villages of Toqua, Citico, and Bussell Island, there is also ample evidence for smaller satellite communities ranging from single family dwellings to moderately large settlements comprised of aggregated households. Settlement differences between local centers, hamlets, and homesteads were not simply related to community size. Whereas local centers evolved into highly structured,

bounded settlements, exhibiting internal differentiation between domestic and public/ceremonial areas, the archaeological remains of hamlets and homesteads showed only limited concern with community planning. The spatial distribution of hamlets and homesteads identified within the Dallas site sample suggests further that local centers may have been surrounded by numerous smaller settlements dispersed throughout the immediate site vicinity. The fact that such sites have extremely low archaeological visibility supports a substantially higher expected density for these sites within the study area.

Historic Period

The aboriginal occupation of the lower Little Tennessee River valley during the Historic period is represented by the Overhill phase (A.D. 1600-1838). This phase, associated with the Overhill Cherokee, encompasses a considerable range of settlement variability resulting from culture change brought about by European contact. Although the Overhill phase probably developed during the seventeenth century, no sites were identified within the study area that date to this period. The majority of archaeological sites comprising the Overhill site sample date instead to the mid-eighteenth century. During this period, several large Cherokee towns were established along the Little Tennessee. These settlements were well documented both archaeologically (Baden 1983; Chapman and Newman 1979; Guthe and Bistline 1978; Polhemus 1983; Russ and Chapman 1984; Schroedl 1982) and ethnohistorically (Williams 1927). During the Federal period following the Revolutionary War, the area was rapidly depopulated as Cherokee families were forced to move south to escape Euroamerican encroachment

(Mooney 1975). Although the spatial distribution of several late Cherokee sites is known from early land survey records (e.g., Armstrong 1820), few of these sites were sampled by archaeological survey and testing.

Thirty-three Overhill phase components were identified within the study area (Table 92). These sites occurred along the entire length of the Little Tennessee River and along Tellico River; however, most were concentrated within the upper portion of the Little Tennessee River valley above Ninemile Creek (Figure 58). The site typology (e.g., local centers, hamlets, and homesteads) and criteria for site classification were the same as those used for earlier Mississippian phases. In addition, sites that yielded small numbers of eighteenth and early nineteen century trade items, but no diagnostic pottery, were classified as probable homesteads.

These data were complimented by a detailed map of the upper valley area, drawn by Lt. Henry Timberlake in 1762 (Williams 1927), which located principal towns, hamlets, and isolated houses (Figure 59). The relative accuracy of this map was confirmed by archaeological survey and excavation within the Tellico Reservoir. The Timberlake map identified ten separate Overhill towns--Mialoquo, Tuskegee, Tomotley, Toqua, Tanasee, Chota, Citico, Halfway Town, Chilhowee, and Tallassee. All but the latter two settlements were situated within the study area and, of these, only Halfway Town was not sampled by archaeological excavation. The apparent small size and lack of a Cherokee name suggest that Halfway Town was probably a large hamlet. At least ten other hamlets, identified by clusters of two or

Table 92. Distribution of Overhill phase sites.

Landform	Site Type A n	A %	B n	B %	C n	C %	Total n	Total %
T-1 Terrace	0	0.0	2	40.0	11	50.0	13	39.4
T-2 Terrace	5	83.3	0	0.0	5	22.7	10	30.3
>T-2 Terrace	1	16.7	2	40.0	4	18.2	7	21.2
LTRV Slope	0	0.0	0	0.0	0	0.0	0	0.0
Tellico Valley	0	0.0	1	20.0	2	9.1	3	9.1
Tellico Slope	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Valley	0	0.0	0	0.0	0	0.0	0	0.0
Tributary Slope	0	0.0	0	0.0	0	0.0	0	0.0
Upland	0	0.0	0	0.0	0	0.0	0	0.0
Total	6	100.0	5	100.0	22	100.0	33	100.0

Site Types: A - Center
B - Hamlet
C - Homestead

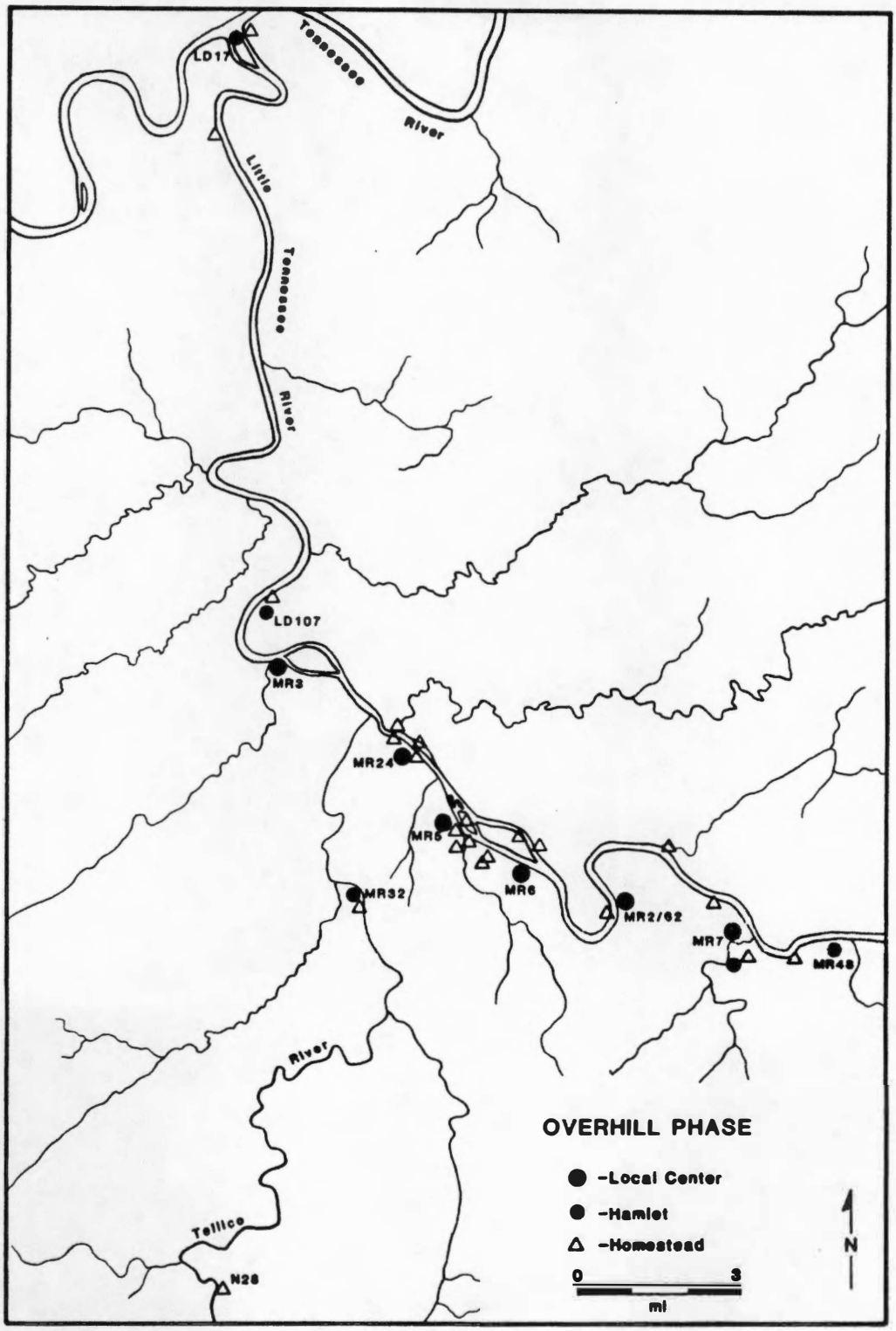


Figure 58. Location of Overhill phase sites.

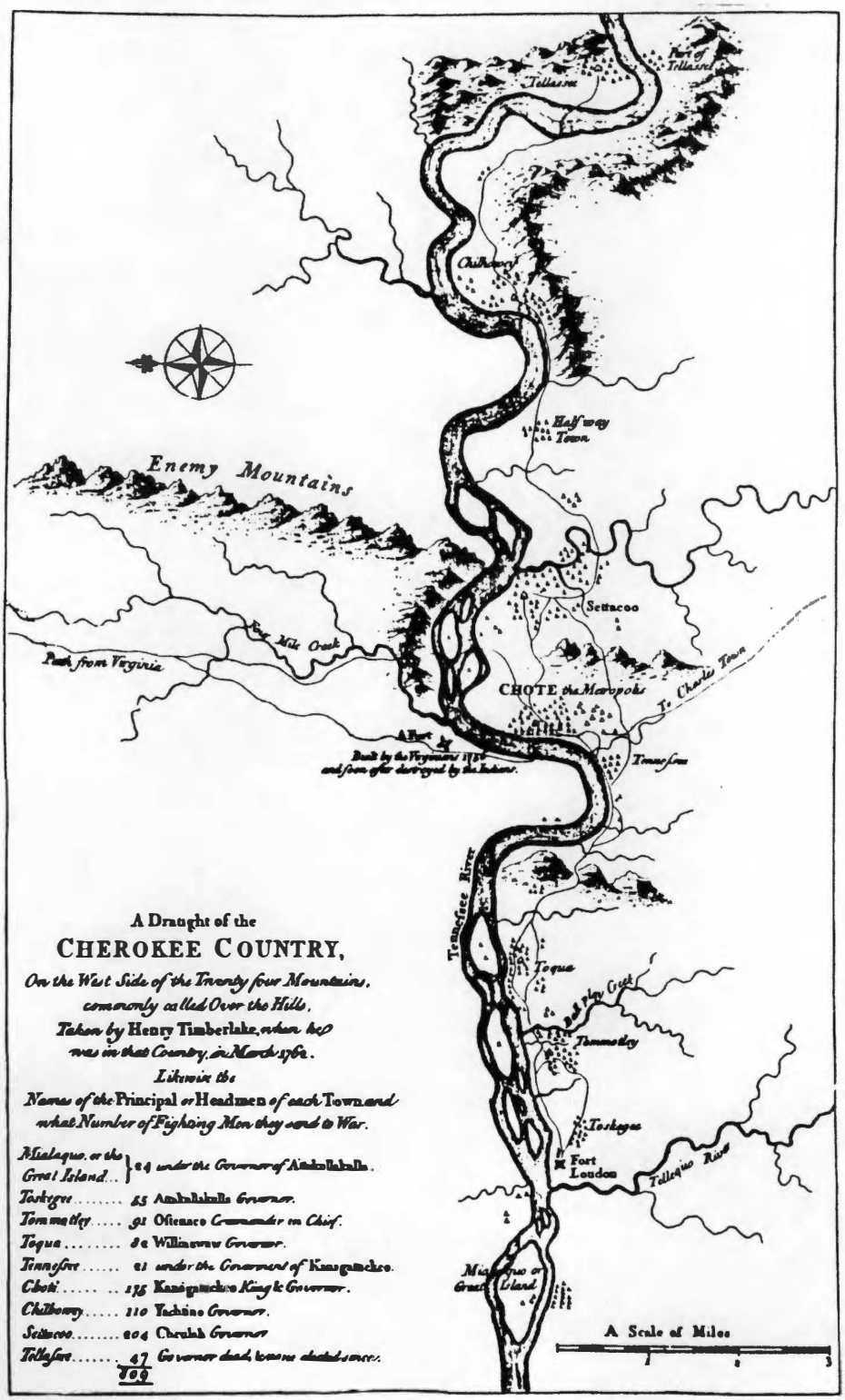


Figure 59. Lt. Henry Timberlake's 1762 map of the Overhill Cherokee area (Williams 1927).

more houses, are shown on the Timberlake map, together with numerous isolated houses or homesteads situated on islands, along the river, and along footpaths between the towns.

Historical documents suggest a gradual expansion of Overhill settlements down the Little Tennessee River valley during the eighteenth century. The earliest towns were apparently Tallassee, Citico, and Tanasee (Chapman 1985b:100), while the downstream sites of Tomotley, Tuskegee, and Mialoquo probably represented late refugee villages from the Lower, Middle, and possibly Valley Towns (see Baden 1983:20; Guthe and Bistline 1978:2). During the latter half of the eighteenth century, Chota functioned as the primary political center within the valley.

Six Overhill sites were classified as local centers. All of these represent towns identified by Timberlake and were situated along second and third alluvial terraces. The largest Overhill settlement was represented by the adjacent sites of Chota and Tanasee (40MR2/62). These sites covered 60 to 80 acres, approximately 10% of which was excavated during 1939 and between 1969 and 1974 (Schroedl 1980, 1982). Twenty-eight structures were excavated at Chota. These included two superimposed townhouses and an associated summer pavilion, eight paired winter-summer houses, nine single dwellings, and two small outbuildings. Only six structures were excavated at Tanasee and consisted of two paired winter-summer houses, one single dwelling, and an outbuilding.

The spatial pattern of structures at Chota suggests a loose arrangement of dwellings widely scattered throughout the village.

Household units were comprised of a single circular winter house (ca. 22 ft in diameter with four central support posts and a central hearth), an open rectangular summer structure or pavilion (ca. 17 x 31 ft), and associated pits and burials. Small sheds or outbuildings were also constructed. Schroedl (1980) has suggested that many of the trash-filled pits associated with structures probably were used to recover soil for daubing structure exteriors. A central area of the Chota village was reserved as public space. Components of this area included a large, octagonal townhouse (ca. 60 ft in diameter), an adjacent rectangular pavilion, and an open plaza.

This pattern of intrasite structure appears to be generally applicable to other Overhill towns within the study area. With the exception of Tuskegee (40MR24) which may represent a comparatively small refugee village (Guthe and Bistline 1978:2), most towns consisted of widely scattered houses and house clusters covering areas of more than 60-80 acres. Unlike the compact, palisaded villages of the preceding Dallas phase, Overhill towns were highly dispersed with only minimal internal structure. In addition to Chota, large octagonal townhouses were identified archaeologically at Toqua (40MR6), Tomotley (40MR5), and Mialoquo (40MR3). Timberlake's map also depicts a townhouse at Citico (40MR7) (Figure 59).

Differences among these sites, aside from ceramic variability, relate mostly to domestic architecture. Whereas domestic structures at Chota-Tanasee and Toqua consisted primarily of paired winter-summer houses, architectural data from Tomotley and Mialoquo indicate a predominant pattern of rectangular structures that often occurred in

clusters of two to four houses. At Mialoquo, these houses measured 10-15 ft by 20-30 ft and were interpreted as single-family dwellings (Russ and Chapman 1984). The Tomotley structures, conversely, were much larger (ca. 10-15 ft by 40-50 ft) and may represent multiple households (Baden 1983:128). While both rectangular and paired winter-summer houses were identified at Citico (Chapman and Newman 1979), it is uncertain whether this situation reflects synchronous variation or different periods of occupation.

Five Overhill sites were identified as probable hamlets. These sites were located along the first and third terraces of the Little Tennessee River, and along Tellico River. Two of these sites--Halfway Town (40MR48) and Kahite (Starnes site - 40MR32)--were documented historically (King 1977; Schroedl 1978c; Williams 1927). Although limited excavations were conducted at the late eighteenth century site of Kahite, insufficient data were obtained regarding architecture and intrasite structure (Salo 1969). Schroedl (1978c:213), noting a spatial clustering among historic artifacts and corresponding absence of postholes, has suggested that houses at this site may have consisted mostly of horizontal log structures. Kahite was the only hamlet identified along Tellico River.

Evidence of an earlier hamlet was recovered from the Wear Bend site (40LD107), situated about a mile below Mialoquo. Excavations at this site exposed approximately 15,000 ft^2 and identified one paired winter-summer house, numerous other postholes, and at least 26 Overhill features. The density of features, consisting of pits and

burials, suggests the occurrence of other houses not recognized during excavation (Chapman 1980b).

With the exception of a probable hamlet represented by the occurrence of European trade items at Bussell Island (40LD17) (Harrington 1922:77-78), all Overhill phase hamlets occurred near large Overhill towns.

Lastly, 22 sites were classified as probable homesteads. All of these sites were located along the alluvial terraces of the Little Tennessee River except for one site near Kahite and the Bell Rattle site (N28) situated along Tellico River at the southern end of the study area. These sites largely represent individual household units associated with larger towns or situated between towns. Although most homestead sites were identified only by small numbers of surface collected artifacts and lacked architectural data, house types and associated features are probably similar to those observed at larger excavated sites.

Limited testing at the Bell Rattle site provided the only firm archaeological data for the terminal period of Cherokee occupation within the study area (Davis et al. 1982:559-566). This homestead represents one of several life estates located along the lower Little Tennessee River and Tellico River that were granted to individual Cherokee families following the Treaty of 1819 (see Armstrong 1820). Features excavated at this site included a rectangular cellar (ca. 2.5x7 ft) filled with domestic refuse and a circular pit that contained blacksmithing debris. The associated house, evidenced only

by the presence of daub chinking and scattered fragments of limestone, was probably of horizontal log construction.

In summary, the Overhill phase comprises a period of significant culture change brought about by increasing Euroamerican interaction, during which the configuration of aboriginal settlement was greatly effected. The beginnings of the Overhill phase and its relationship to the preceding Dallas phase remain problematical but probably involved a complex process of cultural hybridization (Dickens 1986). Although major Dallas phase sites continued to be occupied during the Historic period, the later settlements were substantially larger and comprised of dispersed household units, involved distinctly different patterns of public and domestic architecture, and lacked perimeter palisades and platform mounds.

Overhill settlement during the Colonial period is represented by the Timberlake map and most of the archaeological record for this phase. The settlement system involved large towns or local centers, which independently rose and declined in prominence during this period, and associated hamlets and homesteads. Toward the latter part of this period, refugees from other Cherokee and southeastern Indian groups were incorporated into this system (Baden 1983:17).

With increased interaction during the Revolutionary War and subsequent Federal period, the lower Little Tennessee River valley was gradually abandoned as many Overhill families moved south to the Hiwassee drainage and beyond (Mooney 1975; Schroedl 1978c:210-212). As a consequence, the settlement pattern became more highly dispersed and shifted away from the lower Little Tennessee River valley. While

some families remained at former town sites, many settled as either isolated homesteads or communities of loosely clustered houses along Tellico River and along the southern tributaries of the Little Tennessee River (see Armstrong 1820). With the Treaties of 1798 and 1819, all lands along the north and south side of the lower Little Tennessee River within the study area were ceded to the United States and the area was opened to Euroamerican settlement (Royce 1887). Thirty-one individuals or heads of families, living between the Little Tennessee and Hiwassee Rivers, chose to remain under the terms of the Treaty of 1819 and received 640-acre reservations (Royce 1899:696). By the period of Cherokee removal in the mid-1830s, it is likely that few of these families remained.

SUMMARY

The purpose of the preceding study was to define phase-specific patterns of aboriginal settlement within the lower Little Tennessee River valley and to evaluate diachronic patterns of settlement stability and change during the 12,000-year period of aboriginal occupation. These goals were accomplished by an analysis of archaeological settlement data, generated by survey, testing, and excavation, from 624 sites representing 894 separate cultural components. Major patterns identified by the study are discussed below.

The archaeological record for the Archaic period (8,500-1,000 B.C.) within the study area reflects a pattern of fluctuating settlement intensity and site distribution through time, and suggests that the position of the lower Little Tennessee River valley within larger

annual territories or ranges (see Binford 1980) was not constant during this period. Whereas the settlement patterns defined for the Lower Kirk, Upper Kirk, Kirk Stemmed/Stanly, Morrow Mountain, and Iddins phases are spatially extensive and indicate broad-based exploitation of both valley and upland resources, the data regarding late Early Archaic, late Middle Archaic, and early Late Archaic occupations reflect either site patterns that are confined largely to the lower terraces of the Little Tennessee River or periods of population decrease within the valley. Specific trends in aboriginal settlement recognized during the Archaic period are as follows.

First, the scarcity of Clovis and Dalton finds indicate that the earliest occupations of the study area, prior to about 8,000 B.C., were limited and sporadic. During the following Lower Kirk and Upper Kirk phases of the Early Archaic period, the intensity of occupation increased substantially. Several sites interpreted as seasonally inhabited residential base camps were identified along the first terrace of the Little Tennessee River. A majority of these sites showed evidence of intense and repeated occupation. Logistical camps, probably associated primarily with hunting activities, were located along older terraces near the back edge of the alluvial valley, and along Tellico River and major tributaries. The occurrence of numerous small diffuse lithic scatters within the uplands indicates a substantial use of upland resources.

This pattern of resource exploitation apparently did not persist into later Early Archaic phases. The settlement patterns defined for the St. Albans, LeCroy, and Kanawha phases indicate both a

progressively less intense occupation of the lower Little Tennessee River valley as well as greater focalization of activity along the lower alluvial terraces. Little evidence was found to suggest more than only limited exploitation of uplands and major tributary valleys.

Greater variability in settlement intensity is evident during the Middle Archaic period, and suggests that this was a period of change in the overall configuration of regional land use and resource exploitation. Following the Kirk Stemmed and Stanly phases, the population density within the study area declined. This is reflected by the small number of base camps identified for the Morrow Mountain phase and an absence of late Middle Archaic components from excavations at stratified sites. The progressive decline in population during this period was accompanied by a shift in site distribution. Although base camps continued to be situated along lower alluvial terraces, increased numbers of logistical camps and activity loci along Tellico River throughout the Middle Archaic period indicate a significantly greater emphasis on resource procurement within this drainage. These patterns may reflect logistically organized activities by late Middle Archaic peoples from base camps situated in adjacent river valleys.

A pattern of limited occupation within the lower Little Tennessee River valley persisted into the Late Archaic period. The sparse archaeological record of the Savannah River phase, restricted almost entirely to the Little Tennessee River valley, suggests that resource exploitation within the study area was spatially limited. Settlement data for the Iddins phase, conversely, indicate extensive utilization

of all landforms. Several base camps were located along the lower terraces of the Little Tennessee River, as well as along the Tellico River, and exhibited evidence of intensive, repeated, and possibly extended periods of occupation. The additional occurrence of sites classified as logistical camps and activity loci along these streams suggests an intensive riverine focus.

Although subsequent Woodland (1,000 B.C.-A.D. 600) phases were also characterized by settlement patterns centered upon the lower alluvial terraces of the Little Tennessee River. little evidence exists for residential sites within the Tellico River drainage following the Late Archaic period. The dominant trend in Woodland period settlement is one of gradual population increase and progressively greater differentiation among residential sites. While no such sites appear to have been inhabited on a permanent basis, longer periods of site occupation are indicated. Similarities in residential site content and spatial distribution indicate strong continuity in settlement patterning between the Iddins phase and Early Woodland Watts Bar phase. Likewise, Patrick and Icehouse Bottom phase settlement patterns are also similar. Base camp sites of these phases reflect greater residential activity, a higher degree of sedentism, and increased population size.

The successive settlement patterns defined for the Martin Farm, Hiwassee Island, and Dallas phases of the Mississippian period (A.D. 900-1600) reflect a trend toward substantially greater population size, population consolidation within nucleated settlements, and differentiation of sites forming a settlement hierarchy.

Increasingly complex networks of residential sites characterize this period, involving the establishment and rapid growth of large residential centers accompanied by smaller hamlets and homesteads. Whereas earlier Woodland and Archaic residential sites were located primarily along the first terrace of the Little Tennessee River, this landform was gradually abandoned during the Early Mississippian period. The shift of Mississippian residences to second and older terraces most likely reflects efforts to relocate settlements off flood-prone landforms, and secondarily, to open up greater areas of rich bottomland for maize agriculture.

Finally, aboriginal settlement patterns during the Historic period (A.D. 1600-1838), represented by the Overhill phase, reflect broader cultural changes that resulted from Euroamerican contact and interaction. These patterns evidence a trend toward increased dispersion of residential units within larger settlements, as well as regional dispersion, followed by fragmentation of the residential site populations and eventual abandonment of the lower Little Tennessee River.

CHAPTER VIII

SUMMARY AND CONCLUSIONS

Systematic archaeological investigation of the lower Little Tennessee River valley in southeast Tennessee began in the 1880s under the auspices of the Smithsonian Institution's Bureau of Ethnology (Thomas 1894). During the century following these early explorations, 624 archaeological sites were identified that document a sequence of aboriginal occupations spanning over 12,000 years. Most of these sites were recorded as a consequence of investigations to mitigate the impact of the Tennessee Valley Authority's Tellico Reservoir Project.

The purpose of this study was to synthesize the data that resulted from these archaeological investigations in order to delineate settlement patterns and to identify aspects of settlement continuity and change. Aboriginal settlement systems within the lower Little Tennessee River valley were studied through analyses of archaeological data related to regional land use patterns, the spatial distribution of settlements, and intrasite structure. These data were derived from intensive archaeological survey, regional probabilistic sampling, and excavation, conducted by The University of Tennessee between 1967 and 1981. This study greatly expanded upon earlier settlement studies conducted within Tellico Reservoir (Davis et al. 1982; Baden 1985) by integrating archaeological data derived from probabilistic and non-probabilistic survey. The use of both non-site and site-oriented analytical approaches in studying regional archaeological variability permitted detailed observations about settlement

continuity and change that would not have been possible otherwise.

Analyses of settlement data were preceded by the development of chronological models of artifact and contextual variability, an evaluation of the spatial structure of environmental resources, and the definition of a settlement typology. These preliminary studies provided a basis for recognizing and evaluating systemic relationships among sites and artifact assemblages. Chronological models were developed for lithic artifacts, ceramic artifacts, and stratified depositional contexts along the first terrace of the Little Tennessee River, and permitted the temporal classification of selected artifacts and site occupations. Lithic artifact models were based on the results of detailed attribute analyses conducted by Kimball (1982) and allowed phase-specific recognition for most projectile point types, more general period classification for several other formal tool categories, and gross temporal classification for certain classes of lithic debitage. The debitage models were applied only to the probabilistic survey samples whereas the other models were used with all artifact samples. The construction of a ceramic classification model followed an attribute analysis of sherds from 66 excavated assemblages and provided probability estimates for classifying individual sherds, based upon paste, surface treatment, and morphological variables, into each of the Woodland, Mississippian, and Historic period phases. Lastly, a model for predicting the age of buried archaeological strata along the first terrace of the Little Tennessee River was developed using regression analysis. Analyzed variables included location along the river, depth below surface, and

radiocarbon age. This model permitted phase recognition of almost 120 Archaic and Early Woodland components identified by previous backhoe testing within the study area.

The analysis of environmental resource variability provided a basis for interpreting significant spatial patterns among sites and artifacts in terms of resource needs and availability. By considering such variables as physiography and topography, hydrology, geological resource availability, and regional patterning of biotic resources, it was argued that significant discontinuities in resource availability were present that likely contributed to the configuration of aboriginal settlement systems. Major differences were shown to exist between the alluvial valleys of the Little Tennessee and Tellico rivers and the surrounding uplands. Whereas these valleys provided locations suitable for both seasonal and permanent camps and villages, and possessed a high biotic resource potential, upland landforms were probably best suited for hunting and the seasonal harvesting of nut crops. The general lack of available surface water on these landforms, due to karst topography, undoubtedly restricted aboriginal settlement of the uplands.

Finally, the definition of a settlement typology for collector and agricultural settlement systems, utilizing both general anthropological theory and specific models of cultural adaptation within the Southeast, provided a basis for assessing functional differences among sites. Present archaeological data throughout the interior Southeast suggest that both Archaic and Woodland period adaptations were based primarily upon the hunting and collection of

food resources. Even with the gradual and progressive addition of cultivated plants to native diets following the Middle Archaic period, it is likely that collecting remained a dominant subsistence strategy. Consequently, a single settlement typology was considered appropriate for addressing the problem of functional differentiation among Archaic and Woodland sites. Three major site types were defined and included base camps, logistical camps, and activity loci. A second typology was defined for the Mississippian and Historic periods because of the dominance of maize agriculture during these periods and increased social complexity. This typology allowed for functional differences among residential sites and included local centers, hamlets, homesteads, logistical camps, and activity loci.

Regional land use patterns were defined through the spatial analysis of artifacts, employing a "non-site" sampling design, from a 34,000-acre survey area. Artifact samples were generated by random sampling of 425 300x300-ft quadrats. These quadrats were systematically plowed and surface collected. This sampling method permitted the recovery of comparable artifact collections representative of the entire study area and demonstrated that probabilistic archaeological survey can be successfully undertaken in regions such as the Southeast where vegetation normally inhibits surface collecting. Perhaps the most important lessen learned from the probabilistic survey was that most archaeological remains associated with "off-site" resource procurement activities are often unrecognized by either traditional survey methods or sampling techniques involving limited shovel testing. In addition, methods of analysis which rely upon the site as

a basic unit of analysis are largely inappropriate to the archaeological study of these off-site activities.

In the present study, it was found that detailed comparisons of functional artifact classes across landforms were extremely useful in defining regional patterns of aboriginal behavior. These comparisons, aided by a series of multivariate statistical techniques including principal component and nearest neighbor analyses, indicated that: 1) aboriginal uses of valley and upland landforms were distinctly different and could be modeled as a dichotomy between site maintenance versus resource extraction activities; and 2) there was no significant change in this pattern over time except for increases or decreases in intensity of landform use. Artifact samples from valley landforms were dense and represented a wide range of diverse activities including tool maintenance and repair, food preparation and consumption, shelter construction, and other domestic-related activities. Upland-oriented activities, showing greatest intensity during the Archaic period, appeared to be associated mostly with logistically organized hunting, and were represented archaeologically by very low densities of debitage, ad hoc cutting implements, and discarded or lost projectile points.

These conclusions about aboriginal land use within the study area were helpful in the subsequent analysis of settlement patterns because they defined the expected general spatial distribution of functionally distinct settlement types. Important criteria were established for recognizing residential site behavior from surface collections. These include moderately high artifact density, the presence of artifacts

representing site furniture or maintenance items, and evidence for multiple occupations. The land use study also produced unique information about the spatial distribution of resource procurement activities which, because of low archaeological visibility, were either under-represented or absent from site samples for specific cultural phases. A final and important benefit of the probabilistic survey was that it provided a basis for evaluating biases in the overall site sample.

Settlement patterns for each of 17 recognized cultural phases and four undesignated temporal units, dating from the Paleo-Indian to Historic period, were defined from a sample of 624 archaeological sites representing at least 894 separate cultural components. Sites were distributed along the lower Little Tennessee and Tellico rivers, along tributary streams, and within the surrounding uplands. The process of settlement analysis involved the recognition of phase-specific cultural components using chronological models of artifact variability and the functional classification of those components based upon artifact density, artifact content, and archaeological feature data when available. Individual settlement patterns were derived from the spatial distributions of functionally distinct components and a synthesis of available information about intrasite structure and content.

Evaluation of similarities and differences between phase-specific settlement patterns indicated four major diachronic trends. First, the Archaic period was characterized by fluctuations in settlement intensity and distribution that appear to reflect shifts in annual

territories or ranges. While part of this variability is due to differences in the duration of individual Archaic phases, substantial differences in the relative frequency of site types between phases suggest causal factors other than simply sampling bias. Archaic settlement patterns were comprised of sites classified as base camps, logistical camps, and activity loci. For the Lower Kirk, Upper Kirk, Kirk Stemmed/Stanly, Morrow Mountain, and Iddins phases, these patterns reflect intensive utilization of both valley and upland zones. Conversely, the settlement patterns of the St. Albans, LeCroy, Kanawha, and Savannah River phases reflect only limited occupations. The absence of an unambiguous archaeological record for the late Middle Archaic period further emphasizes this pattern of fluctuating settlement systems.

If the late Early Archaic, late Middle Archaic, and early Late Archaic periods experienced declines in settlement intensity within the Tellico study area, as indicated by the available site inventory, then archaeological evidence for these periods may be better represented in adjacent valleys of the Tennessee and Hiwassee rivers. This possibility, however, cannot be adequately assessed at present due to insufficient data from these drainages. Given evidence for exploitation of the nearby Great Smoky Mountains by Archaic populations that probably resided within the study area (Bass 1977), it can be reasonably concluded that Archaic settlement patterns prior to the Iddins phase probably involved ranges or territories that extended well beyond the lower Little Tennessee River valley.

Second, settlement data suggest gradual population expansion and

a trend toward increased size differentiation among base camps during the Late Archaic and Woodland periods. These sites, while probably not occupied year-round, contained evidence of longer and more intensive occupations than were evident at earlier Archaic base camps. Residential population size apparently also increased, though no sites were sampled to the extent necessary to permit population estimates. To what extent these trends may reflect economic or social changes is uncertain; however, it is suggested that, beginning with the Iddins phase, adaptations became increasingly more localized and territorial size decreased. Bass (1977:109) noted a similar shift in settlement within the Great Smoky Mountains, manifested by increased functional differentiation between valley and upland sites, and the appearance of lithic tool assemblages comprised almost entirely of local raw materials.

Third, settlement change during the Mississippian period was characterized by rapid population growth, population consolidation within nucleated settlements, and the development of settlement hierarchies. These represent the expected settlement consequences of a developing chiefdom-level society. Mississippian settlement types included local centers, hamlets, homesteads, logistical camps, and activity loci. In addition to these changes, there was also a gradual abandonment of the first alluvial terrace for older, more elevated terraces during the Mississippian period. This settlement shift coincided with the establishment of permanent settlements and reflects the need for more stable habitation areas as well as the possible need for increased agricultural lands.

Finally, settlement change during the Historic period, representing the Overhill Cherokee occupation of the lower Little Tennessee River valley, was characterized by a progressive increase in settlement dispersion within large towns and subsequent fragmentation of these settlements into smaller communities following the Revolutionary War. These changes were the direct effect of impacts that resulted from Euroamerican contact. With the encroachment of white settlers and the cession of lands by treaty in the early nineteenth century, the last aboriginal settlements were gradually abandoned for more secure territories to the south.

In conclusion, this study has attempted to synthesize the available archaeological data from the lower Little Tennessee River valley in order to identify general as well as specific patterns of aboriginal settlement. These data, derived from purposive as well as probabilistic sampling of both valley and upland life zones, comprise one of the most comprehensive regional databases within the Southeast and have permitted a much fuller treatment of settlement questions than would have been possible otherwise. While specific aspects of aboriginal settlement patterns may not be directly applicable to other river valleys of the southern Ridge and Valley province or greater Southeast, it is suspected that most of the general spatial and temporal trends discussed above have direct relevance to understanding the nature of settlement systems elsewhere. A determination of just how well the Tellico study area reflects adaptations within nearby drainages such as the Tennessee, Clinch, Hiwassee, Little, and Little Pigeon, however, must await future studies that are both comprehensive

and regional in scope. Hopefully, these studies will benefit from what has been learned in the lower Little Tennessee River valley.

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