WOODSTOCK: THE RISE OF POLITICAL COMPLEXITY IN NORTH GEORGIA

by

JULIE GAYLE MARKIN

(Under the Direction of David J. Hally)

ABSTRACT

This dissertation explores the cultural changes experienced by the inhabitants of northern Georgia during the Woodstock phase (A.D. 800 to 1000). Woodstock subsistence and settlement data provide the foundation for understanding the rise of political complexity (e.g. the Etowah chiefdom) in north Georgia in the Mississippian period, an issue that has been greatly overlooked to this point. The results of my research allow for the construction of a developmental history for the Etowah chiefdom. The Woodstock phase witnessed a dramatic increase in the ubiquity of maize, the addition of new vessel forms in multiple sizes, and a diversification in vessel forms in general. These changes suggest an indigenous response to changes in food preparation and consumption practices related to maize production. Polities of Mississippian chiefdoms were based around administrative centers that often exhibited platform mound and plaza construction. An absence of administrative centers in Woodstock site clusters suggests that in north Georgia the initial stage of polity development involved the coalescence of equally powerful settlements into defined territorial entities. Data generated from this research suggest the evolution of political complexity involved fundamental changes in subsistence regimes and political organization.

INDEX WORDS: Archaeology, Woodstock Phase, Maize, Vessel Form Analysis, Site Clustering, Political Complexity, Etowah

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CHAPTER 1

INTRODUCTION

The transition from Late Woodland to Mississippian culture around A.D. 1000 represents a major step in the development of cultural complexity in the southeastern United States. Complexity here denotes agricultural intensification, a centralized political system in which power becomes concentrated in the hands of a few, and unequal access to land or resources. Late Woodland societies had a tribal organization characterized by decentralized political systems and a relatively egalitarian social status system (Sahlins 1958; Service 1962), while Mississippian societies were organized as chiefdoms. A *chiefdom* is defined as that particular form of political organization that involves unequal access to the means of production (Johnson and Earle 2000), hereditary ranking (Earle 1991; Sahlins 1958), and a centralized leadership in which power and authority over thousands or tens of thousands of people are concentrated in the hands of a central figure (Earle 1987; Steponaitis 1986). Mississippian cultures are thus considered to be more complex than Late Woodland cultures. To understand the development of political complexity in the Southeastern United States, we need to explore the connections between subsistence intensification and political integration (Johnson and Earle 2000).

The term Emergent Mississippian has been coined to refer to the period during which Woodland cultural characteristics were replaced by Mississippian cultural characteristics (Kelly 2000; McElrath et. al 2000). Emergent Mississippian culture has been recognized in the Range phase of the central Mississippi River Valley (Kelly 2000), Moundville I phase of the Black Warrior River Valley in Alabama (Knight and Steponaitis 1998), and the Mississippian I or Martin Farm phase of the Little Tennessee River Valley in southeastern Tennessee (Schroedl et. al 1985). Cobb and Garrow (1996) supply a provisional examination of Emergent Mississippian cultures in northern Georgia, but no further attempts have been made to thoroughly investigate this period in this region. This study attempts to shed light on the Woodland to Mississippian transition by examining changes in subsistence systems, ceramic vessel assemblages, and settlement patterns that occurred in this region (Figure 1.1) around A.D. 800 to A.D. 1000.

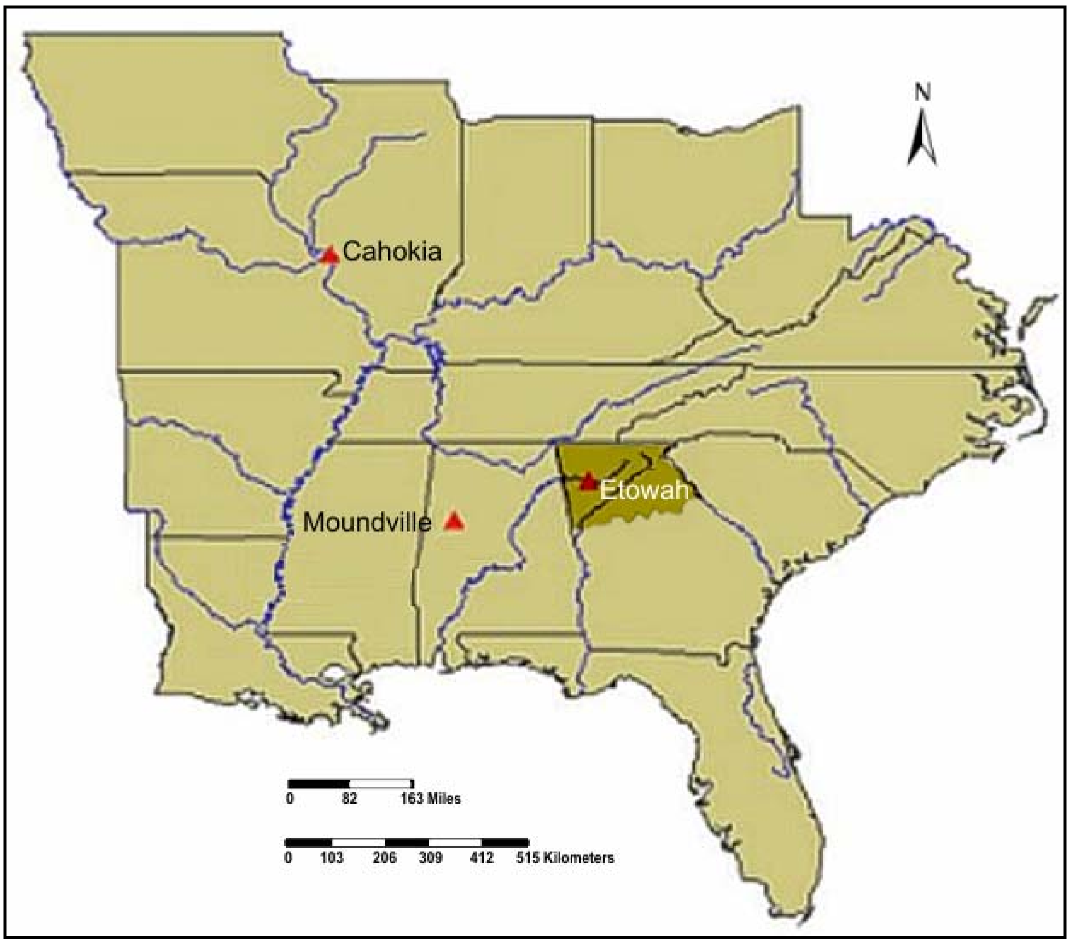

Figure 1.1 Mississippian chiefdoms mentioned in the text. The darker shaded area denotes the 44 county North Georgia study region.

I argue that the Emergent Mississippian phase in northern Georgia is represented by the Woodstock phase (Caldwell 1957; Cobb and Garrow 1996). Thus, the Woodstock phase is the focus of the research reported in this dissertation. By analyzing available archaeological data, I demonstrate that the intensification of maize cultivation and the initial steps toward political centralization took place during the Woodstock phase.

Changes in subsistence systems affect not only dietary adaptations, but also social and political organization. Identification of changes in food production strategies is therefore important for understanding the rise of Mississippian culture. To this end, I analyze botanical collections from Woodstock phase sites across northern Georgia, pottery vessel forms, and the spatial association of Woodstock sites with agriculturally productive soils to determine whether intensive maize agriculture developed at this time or later in the Mississippian period.

I use survey and excavation data pertaining to settlement patterns and subsistence to examine the organizational changes that occurred during the Woodstock phase at the local and regional levels. The Mississippian chiefdom settlement pattern is characterized by the spatial clustering of habitation sites around platform mound sites that served as political administrative centers (Hally 1996; Steponaitis 1978). No evidence for Late Woodland site clustering has been reported in the Southeast. A small number of earthen platform mounds are known to date to the Late Woodland period, but the stratigraphic nature of these mounds and their functions is not well understood.

Determination of site clustering during the Woodstock phase is important as it may indicate that the initial steps toward political centralization occurred at that time. In order to investigate the distributions of contemporary sites more accurately and determine whether or not site clustering characterizes the Woodstock culture, I divide the phase into two sub-phases, Early Woodstock and Late Woodstock, and analyze the spatial distribution of sites assignable to each.

1.1 History of Maize Cultivation

It has been argued that maize "clearly revolutionized American Indian life in many regions" (Bellwood 2005:156). Indeed, the politically centralized pre-Columbian societies of the Inca, the Maya, and the Aztecs were fueled by well-established and highly productive agricultural economies. Like the Maya and the Aztecs, the economies of the inhabitants of the Eastern Woodlands of North America were based on the cultivation of the triad of squash, beans, and maize, "the paramount crop plant of the Western Hemisphere" at the time of European contact (Smith 1995:147). To ask questions about how maize agriculture was critical in fueling the development of these politically centralized societies, we must first understand the history of the domestication and cultivation of maize.

One school places the origin of modern maize in the domestication of an extinct South American wild maize (Mangelsdorf 1974). However, most botanists agree that maize was domesticated from the Mexican annual teosinte, with *Zea mays mexicana* or *Zea mays parviglumus* being the most similar to maize in morphology (Beadle 1980; Bellwood 2005; Davies and Hillman 1992; Doebley 1990; Galinat 1985; Smith 1995). Modern day populations of *parviglumis* suggest an origin for maize domestication along the Balsas River drainage in southwestern Mexico (Doebley 1990; Smith 1995). From there, domesticated maize moved eastward into the Tehuacán Valley in the highlands of

Mexico (Kennett and Winterhalder 2006). Maize cobs recovered from excavations conducted in the Tehuacán Valley in central Mexico between 1960 and 1964 (MacNeish 1972) are the oldest maize yet recovered in the Americas. AMS radiocarbon dating of these cobs indicates they are between 5500 to 6000 years old (Benz and Iltis 1990; Long et al. 1989; Piperno and Flannery 2001).

Early maize cobs were small, between 19 and 25 millimeters, and had two to four rows of grains (Kennett and Winterhalder 2006; Smith 1995) with each kernel individually enclosed in its own glume (Davies and Hillman 1992). Although small, these cobs clearly represented domesticated maize as they required human action to ensure dispersal and propagation of the nondisarticulating kernels. Human selection toward the traits we see today began between 6250 and 4500 years ago (Kennett and Winterhalder 2006). A naked-grained phenotype was promoted, eventually producing modern maize in which kernels are not individually enclosed but instead are exposed on a cob that is enclosed by a large leaf sheath (Davies and Hillman 1992). Clear botanical evidence for intensive maize agriculture and large cob sizes in Mesoamerica is not apparent until about 3000 years ago.

Maize cultivation moved northward and arrived in the southwestern United States around 3200 B.P. and moved across the Great Plains to arrive in the eastern woodlands of North America by A.D. 1 to A.D. 200 (Smith 1995). Carbonized maize kernels have been recovered from the Harness site in Ohio (A.D. 220), the Icehouse Bottom site on the Little Tennessee River (A.D. 175), and the Holding site in the American Bottom (A.D. 1 to A.D. 150) (Smith 1995). The inhabitants of the eastern woodlands were already accomplished farmers at this time, having domesticated the native seed plants of marsh elder, chenopodium, and sunflower more than 2000 years before the introduction of maize. It would be another 600 to 800 years, however, before maize became the central crop produced by the agriculturally-based societies of eastern North America. Present only in small amounts in archaeological contexts prior to A.D. 800 to A.D. 900, maize was cultivated only as a minor crop.

Stable isotope analysis of human skeletons from the time maize was introduced up through the Mississippian period supports the archaeobotanical evidence. Across the Eastern Woodlands, a dramatic increase in the consumption of C_4 plants (i.e. maize) as compared to C_3 plants (i.e. native wild plants and cultivated seed plants) is indicated around A.D. 900 (Smith 1995). The relative proportion of carbon from C_4 plants increased from 0% in analyzed Archaic skeletal populations to more than 70% in Mississippian skeletal populations (van der Merwe 1980).

Why maize remained such a minor crop for so long remains a topic of debate and speculation. Bellwood (2005) suggests the lag may be the result of maize needing to evolve biologically through human selection as it spread. It has been argued that in the Eastern Woodlands, maize needed time to acclimate to the temperate climate (Fritz 1992; Keegan and Butler 1987; Scarry 1993a) before it could fuel the development of ranked agricultural societies. Once maize had developed larger cobs and higher levels of productivity, i.e. higher yields, it could have supported intensive production and population growth (Flannery 1972). Further advantages to maize include its ability to mature quickly and to be stored easily; additionally, through human selection, maize has evolved many high-yielding varieties (Bellwood 2005). Early varieties of maize were less productive, and, requiring the clearing of forests, weeding, and watering, the cultivation of these plants was more labor intensive than the cultivation of native seed plants.

Kennett et al. (2006) argue that in the Soconusco region of Southern Mexico, the delay between the introduction of maize and maize-centered economies was the result of the low energetic returns of maize as compared to other available resources. A result of the high energy costs of initial maize production, the resource rich Eastern Woodlands experienced a balance between farming and foraging (Bellwood 2005) and slow population growth among the farming populations. Thus, while cultivation of later, high-yielding varieties of maize could have fueled population growth and the need for intensified cultivation, cultivation of early varieties of maize likely did not lead to swells in populations and a concomitant need for increased cultivation.

Recent studies suggest that while increasing cultivation of maize enabled the development of ranked agricultural Mississippian chiefdoms, cultivation of and dependence on maize did not continue to increase until European contact. In fact, archaeobotanical evidence from the Parkin site in eastern Arkansas reveals that the production of maize actually declined during the Late Mississippian (A.D. 1400-1500) occupation when compared to earlier Mississippian (A.D. 1300-1400) contexts (Scarry and Reitz 2005).

1.2 Models for Understanding Increasing Political Complexity

Archaeologists have long been interested in explaining how societies develop and understanding the relationships between intensification of subsistence systems and the integration of communities into distinct political entities (Johnson and Earle 2000).

Ethnographic research documents great variability in human societies as each is shaped by differing environmental conditions and cultural traditions. This variation encompasses small-scale foraging, egalitarian societies based on kin relations and large, state-level societies characterized by intensive agriculture, social stratification, and a centralized bureaucracy. To bring order to the ethnographic information, anthropologists developed formal evolutionary models. As recognized by Childe (1925, 1951), archaeological investigation is particularly well-suited to studying cultural evolution as it examines the process of cultural change over long periods of time (Haas 2001).

Morgan (1877) and Tylor (1871, 1881) independently constructed evolutionary typologies based on the identification of broad cross-cultural patterns to explain the diversity in cultural organization apparent in the ethnographic record (Haas 2001). Regarding cultural development as a continuum, loosely organized, kin-based, egalitarian hunter-gatherer societies were situated on one end and hierarchically organized, class-based agricultural societies characterized by the control of economic resources and political power by a small segment of society were located on the other. These models were based on an inherent assumption of progress and the evolution of societies "from an inferior to superior condition" (Johnson and Earle 2000:2) through the stages of savagery and barbarism to civilization. These evolutionary models ultimately were criticized for being based on an elitist Western ideal of progress and were found lacking on empirical grounds; traits that defined the different stages did not occur only in societies with the same level of complexity (Haas 2001; Johnson and Earle 2000).

Early in the twentieth century, archaeologists used a historical-diffusionist approach to study cultural change. According to this approach, almost all of the change evident in the archaeological record could be attributed to either the diffusion of ideas from one group to another or migration, in which one group replaced another (Willey and Phillips 1958). Diffusionists argued that it was unlikely that basic discoveries, such as pottery or agriculture, were invented twice (i.e. independently in different areas) because the human capacity for innovation was limited. Thus, innovations spread from a single original source to other areas. Chronologies that suggested independent invention were constructed through the classification and seriation of artifact types for prehistoric cultures throughout the American Southwest, Midwest, and Southeast. However, prior to the availability of radiocarbon dating, these chronologies were not sufficiently calibrated to rule out diffusionist interpretations.

In the 1940s and 1950s archaeologists recognized that "systemic change toward complexity was clearly evident in the archaeological record" (Johnson and Earle 2001:4). Reviving the nineteenth century belief in progress, White viewed culture as an integrated system in which human institutions have a particular utility in bringing about cultural advancement. Believing culture's role was to "[harness] energy and [put] it to work in the service of man" (White 1959:39), White's unilineal model of cultural evolution focused on the means of energy capture (technology) and expenditure (economic system) (Haas 2001; Johnson and Earle 2000). Less complex societies capture energy from nature through human efforts alone – hunting and gathering wild foods. More complex societies are able to capture more energy through the use of nonhuman (i.e. technological) means - draft animals, irrigation, and ultimately machinery powered by fossil fuels. Intensification, then, denotes the process of increasing crop production through the ability to harness more and more energy.

Steward's multilinear approach investigated the relationship between sociopolitical institutions and the ecology of human subsistence. Steward believed not only that cultures move through increasingly complex organizational types but that "new emergent forms" (1955:51) were shaped by the environment. Steward's model of cultural evolution was based on the idea that cultures *adapted* to the varying conditions of their natural and social environments. Although Steward did not believe societies progressed through unilineal types, he did believe that general organizational types recurred in societies around the world and thus could be useful in investigating cultures at different levels of complexity (Haas 2001).

Focusing on broader patterns of social organization, Service's unilineal evolutionary model characterized the cultural continuum as a progression from hunter-gatherer bands to agricultural states (Johnson and Earle 2000). According to Service (1962), in some regions, environmental diversity led to subsistence specialization among communities. Subsistence specialization required a centrally managed redistribution system. By organizing labor and controlling the development (Johnson and Earle 2000) and redistribution (Haas 2001) of resources, chiefs were able to gain political power and control over entire regions.

Carneiro (1970) identified warfare as the mechanism of state development within the context of a circumscribed environment. As populations grow and fill in the landscape, the mobility of autonomous villages declines. Population growth in areas with limited agricultural land, such as narrow river valleys, creates a situation in which there is conflict over the acquisition and control of arable land. Without the ability to move to a new location, warfare results in the political subordination of defeated villages to militarily stronger villages, a process that leads to the development of centralized chiefdoms and, ultimately, states. A similar situation may also arise in environmentally rich areas where the population density is highest in the central area of settlement. Centrally located villages become socially circumscribed by closely packed neighboring villages. Without the mobility to move away, territorial conflict leads to the growth of large villages, because a larger size is advantageous both defensively and offensively (Carneiro 1970).

Although the validity of assigning cultures to discrete evolutionary stages has come into question as societies are often characterized by a mix of stage characteristics – e.g. a loosely organized, egalitarian agricultural society that produces monumental architecture for the reaffirmation of kin ties – stage models are important heuristic devices that illuminate cross-cultural patterns in the evolution of cultural systems. However, they minimize the variability between the numerous social and environmental factors that influence large-scale political change, limiting their ability to explain cultural change (Flannery 1983). The universal application of these evolutionary models has also been criticized for ignoring the role that human agents played in cultural change (Drennan 1996; Earle 1997; Flannery 1972).

Because the archaeological record provides a "direct material manifestation of culture change over time" (Haas 2001:9), archaeologists in the 1960s began to direct emphasis toward understanding general processes and mechanisms leading to increasing complexity (Arnold 1996; Flannery 1972). The New Archaeology introduced by Binford in the late 1960s focused on identifying relations between technology and the environment as key factors that determine changes in individual cultural systems. In this vein, Flannery (1968) argued that systems theory was particularly suited to identifying such relations. Systems theory is based on two premises: (1) a system is comprised of interacting parts and (2) rules describing how important aspects of systems functioned could be formulated, regardless of the specific nature of a system. By mapping feedback between environmental and cultural variables, a systems theory approach allowed archaeologists to address increasing complexity by studying structure-maintaining and structure-elaborating processes. In the context of fluctuating external inputs, negative feedback maintains a system in a steady state whereas positive feedback results in changes to a system's structure. In terms of the rise of agriculture in Mesoamerica, a positive feedback loop led to systemic change as favorable genetic alterations caused an increased dependence on maize and beans. This positive feedback loop continued until the plants became the dominant cultivars in an intensive cultivation system (Flannery 1968).

A focus on general processes, however, ignored the impact of individual actors in the emergence of "hereditary decision-makers" (Anderson 1996b:234) and unequal access to resources. The development of hereditary chiefships is regarded not as an unintentional outcome of groups reacting to environmental, demographic or social changes but rather as the result of the actions of individuals intentionally amassing wealth and exerting control over valuable resources (Anderson 1996b; Cohen 1974; Hayden 1996: Roscoe 1988). By reinvesting these surpluses in gifts to relatives and subordinates, aggrandizers or accumulators (Hayden 1996) create a system of social obligation that indebts their associates to furthering their interests and control. Pauketat (1994) asserts that the Cahokia chiefdom emerged through such a system of political actors vying for and manipulating economic resources to consolidate power, which eventually resulted in a divine chiefship.

Thus, archaeologists have begun to investigate individual choice and political action in the consolidation and institutionalization of power by identifying the circumstances by which elites seize control (Johnson and Earle 2000; Pauketat 1994). As population increases, subsistence demands increase, often leading to the development of new technologies and the modification of the environment – e.g. irrigation to increase agricultural productivity – as well as competition for resources. The intensification of production to meet increasing population demands leads to new types of problems (Johnson and Earle 2000:27-32). To buffer against uncertain harvests, community food storage or reciprocal feasting arrangements between communities may be established to manage production risk. Rich resources such as fertile bottomlands become increasingly desirable and less available, requiring effective defense against seizure from outside communities. The depletion of local resources increases the need for non-local exchange systems to provide communities with basic foodstuffs in bad seasons or with materials needed for making tools (e.g. axes). Solutions to each of these problems require the increased economic integration of communities and powerful leadership, creating opportunities for control that enable elites to demand a share of production (Johnson and Earle 2000:27-32).

Varying sources of power (economic power, military might, and ideology) and the varying ways these sources link to each other greatly affect the scope and stability of a leader's political position (Earle 1997). Earle argues that all three are involved in the development of political power in chiefdoms, but states that economic power, in terms of control over production and exchange of subsistence (staple goods) and wealth (prestige goods), is the most important. Economic power is more easily restricted than military might or ideology, as the chief controls access to productive resources, particularly improved agricultural land, and can limit channels for distribution (Johnson and Earle 2000). Also, economic power is more capable of accessing the other sources of power as surplus production can be invested in developing and controlling military and ideological power (Earle 1997; 2000). Thus, control of production and distribution of staples and prestige goods enables the control of military might (enforcement) and ideological right (legitimization) (Earle 1997).

Archaeological evidence suggests that the manifestation of social change varied widely among different groups and that different "power strategies represent different routes to (and from) social complexity" (Earle 1997:194). To develop theories that more thoroughly explain the differential mobilization of social and ritual resources in the evolution of complexity, a "dual-processual" (Blanton et al 1996; Feinman 1995) approach may be useful as it requires explanations to focus on internal (societal) and external (environmental) factors. Thus, social changes may have arisen as individuals or groups employed network-based, individualizing strategies or corporate-based, group-oriented strategies to manipulate resources to increase social, political, and economic power (Berezkin 1995; Feinman 1995; Kristiansen 1991; Renfrew 1974). In contrast to evolutionary models, these strategies do not represent stages in a progression from corporate/early to network/late but most likely cycle through time, with the strategy that is dominant at a particular time influencing the nature of social and political structures (Blanton and Taylor 1995).

Corporate strategies are based on a staple finance system (Kristiansen 1991) in which leaders mobilize food surpluses by requiring a payment of staple (food) goods from individual households in exchange for land use rights (Billman 2001; Johnson and Earle 2000). Surpluses are then distributed to non-producers, i.e. warriors, artisans, elites, or corvée labor. Corporate-based political systems distribute power across different groups and sectors of society to inhibit the monopolization of wealth by an individual (Berezkin 1995; Blanton et al 1996). Network-based political systems are built around a monopolistic control of the sources of power and are exclusionary in nature (Blanton et al 1996). A wealth finance system, the production and distribution of valuables (prestige goods) is controlled by the elite (Billman 2001; Johnson and Earle 2000; Kristiansen 1991). Because prestige goods are exchanged in a separate sphere, they are not easily exchangeable for staple items (Bohannan 1955), limiting the access of commoners (Earle 1982).

Gilman's coercive/egalitarian oriented strategy similarly addresses the differential mobilization of resources in the evolution of complexity (1995). Coercive/egalitarian strategies emphasize small scale inequalities and a strong association between intensified cultivation and emerging complexity. The importance of wealth differentials is indicated by a concern for defense, surplus accumulation, and the production of valuables (specialization). Wealthier individuals could compete for more resources (arable land), which could generate surpluses that could be invested in specialization (prestige goods), which ultimately enabled and enhanced social stratification (Gilman 1995).

Bender (1990) argues that to understand cultural evolution we must consider not only multiple external variables but also the historically constituted political and economic conditions that effect changes in social forms. These conditions involve the social relations and perceptions of previous generations, as well as the historical divisions of labor. She further asserts that farming *per se* does not set the wheels of social evolution or inequality in motion nor do small-scale, kin-based farming societies have emergent properties that stimulate greater social inequality and stratification (Bender 1990).

Social evolution is the result of gradually accumulating responses to quantitative changes in intensification and integration (Johnson and Earle 2000). An approach that contextualizes complexity through the study of regional historical trajectories and the relationship between the timing of critical changes and the creation of new social institutions is particularly appropriate for my research (Arnold 1996; Earle 1997). Such an approach has revealed a great deal of similarity in the evolution of complexity in the Moundville and Cahokia chiefdoms (Knight 1997). Considering quantitative changes in intensification, integration, and stratification, Knight (1997) proposed that the historical trajectories of these two Mississippian chiefdoms reflect passage through five developmental stages. This comparative model for the evolution of complexity in the Moundville and Cahokia chiefdoms is particularly useful for understanding the evolution of complexity in north Georgia.

During the first developmental stage, production of native crops is intensified and maize production in particular increases. In the second stage, populations coalesce (i.e. integrate) into independent, small-scale polities. These polities are characterized by the clustering of multiple settlements around a single administrative center that generally exhibits platform mound construction. Characterized by site clustering and incipient site hierarchy, the second stage of development signals the initial centralization of political systems. The timing between these two stages is similar: about 75 years for Cahokia and 50 years for Moundville. Furthermore, the time lag between the initial intensification of maize production and the consolidation of site clusters into regional political systems [the third developmental stage] is also comparable: 125 years for Cahokia and 150 years for Moundville (Knight 1997:235-6). The fourth stage involves the entrenchment of the paramount chiefdom, while the fifth and final stage involves chiefdom collapse and the reorganization, or dispersal, of populations. Although Knight determined five developmental stages for the Cahokia and Moundville chiefdoms (see Knight 1997 for a full discussion), the research presented in this dissertation addresses only the first two stages.

Whereas the settlement patterns of politically centralized polities are characterized by site clustering or the integration of several local groups into a single polity, settlement clustering may also occur in tribal societies. Tribal societies denote those societies that have a strong territorial association but generally lack "permanent institutions of centralized authority" (Braun 1977:80-81). The expression of clustering, however, differs depending on the level of centralization. As described for the Cahokia and Moundville chiefdoms above, politically centralized societies should exhibit clusters that include settlements of varying sizes located around a central settlement that exhibits public architecture. In non-centralized societies, all settlements within a cluster should resemble each other in size and architectural complexity because all towns are politically equal.

Assessing tribal social organization as an adaptive system, Voss (1987) argues that the evolution of tribal organization is a systemic response to the increased environmental variability that arose with the shift from a foraging to a food producing lifestyle. In nonhierarchical societies, regional social networks are critical to responding to environmental variability, with the degree of integration of participants within a network dependent on the duration and level of risk associated with said environmental variability (Braun and Plog 1982). A greater dependence on food production leads to a growing need for the organized allocation of land and the scheduling of labor needed to plant crops to offset the increasing risk of localized crop failure. The attendant upsurge in population density results in reduced land availability. Societies adapted to the unpredictability of a permanent shift from foraging to food producing by making major changes in their "organizational response mechanisms" (Voss 1987:33). More specifically, they adapted through the increased importance of regional interaction networks and the development of boundaries between networks. These networks resulted in the tendency for the villages involved within these regional systems to move closer together, producing settlement patterns that were characterized by spatial site clustering.

According to Service (1962), tribes integrate into regional systems in response to external strife or competition. In Equatorial Africa around 2000 B.C., households, or Houses, comprised by Big Men and their extended family and servants competed with each other to increase the size and security of their households (Vansina 1999). For security and economic reasons, several independent Houses clustered their residences together into a village that was governed jointly by the constituent Big Men. In an environment of competition, four to five autonomous villages integrated into a regional system or district for the purposes of mutual defense and the exchange of goods or marriage partners (Vansina 1999). This type of organization was stable until around

A.D. 1000. Transformations in different geographic areas resulted in the destabilization of the balance of power as one district became more powerful than its neighbors through the ambition of its leaders or the invention of new institutions to enlarge and perpetuate their power. In some districts, the response to these transformations involved "relentless territorial centralization" (Vansina 1999:168) that eventually turned the district into a chiefdom; in other districts, the response was to invent political formations that relied on efficient cooperation on specified issues "without any genuine centralization" (Vansina 1999:171).

Along the canals of the Salt and Gila Rivers in southern Arizona, Hohokam settlements clustered into rectangular territories of roughly 40km^2 (Fish and Fish 1994). Each cluster represented an integrated, multisite territorial entity that was characterized by sites that exhibited monumental architecture (e.g. mounds) and canal irrigation. The size and location of each integrated entity probably reflect optimal distances for the transport of crops and daily communication needs (Fish and Fish 1994). This structure of integrated settlements that shared food production risk through subsistence exchange provided a framework for clustering throughout the Hohokam tradition (Fish and Fish 1994). Mound sites appear to be regularly spaced at 5 km intervals along the canal within an integrated entity and likely served as symbols of identity and likewise symbols of differentiation from other such entities in the surrounding areas (Fish and Fish 1994).

Among the Mandan and Hidatsa of the Great Plains, politically and economically independent villages were bound to each other to provide defense against external enemies and a network for trade (Bowers 1950; Meyer 1977:12-17, 71-73). Because these clusters of mutually cooperative sites form on the basis of a shared identity, uninhabited buffer zones can be expected between settlement clusters of groups with differing identities. Because all towns are politically equal, all settlements within a cluster typically resemble each other in size and architectural complexity.

In light of the above discussions, the determination of the timing of changes occurring in subsistence practices and settlement patterns is crucial to understanding developing political systems in north Georgia and to modeling the emergence of political complexity in this region. As previously argued, growing populations increase subsistence demands, leading to competition over the acquisition and control of arable land and eventually to the intensification of production. Fertile bottomlands become increasingly desirable but less available. Existing cultural coping mechanisms may no longer have been adequate to mange the growing risks (Rautman 1993) associated with a decreased availability of land and an increased need for production. Woodstock groups likely developed regional social networks to organize the allocation of land and to schedule planting labor, thereby minimizing the risk of localized crop failure. The economic integration of multiple communities resulted in the centralization of authority to provide effective defense for fields. Such control of production enabled a powerful leadership to arise and to restrict access to productive resources.

As exemplified by the equatorial African example above, communal, i.e. tribal, societies have been "repeatedly transformed from within" in response to "population growth, subsistence intensification, [and] decreased mobility" (Nassaney 1992:132). These points of tension strain existing communal coping strategies and allow for alternative strategies to arise, namely the initial formation of regional networks. The establishment of regional tribal networks enables the organized allocation of land and the scheduling of the labor needed for planting. The organizational and scheduling demands of these networks allow ambitious individuals to seize opportunities for control, thereby rising to positions of leadership. The invention of new institutions to perpetuate the power of individual leaders subsequently leads to further elaboration of the network. In the Mississippian Moundville and Cahokia chiefdoms, this process is reflected by the intensified production of native crops and an increase in maize production in particular. The organizational demands of intensified production resulted in the centralization of the political system through the consolidation of power by individual leaders. This process of centralization is demonstrated in both the Cahokia and Moundville chiefdoms by the clustering of multiple settlements around single administrative centers.

In contrast to this model of internal political development, one may argue that the development of political complexity in north Georgia is the result of local populations imitating the political organization of existing chiefdoms to the north in Tennessee and west in Alabama. However, this dissertation will show that political elaboration in north Georgia was not merely the result of imitation but that the significant change enabling the rise of Mississippian chiefdoms was the development of centralized political institutions within existing tribal organizations. These developments should be demonstrated by a dramatic increase in the presence of maize in Woodstock features as compared to Swift Creek or Napier features, reflecting the pattern of increased cultivation of maize seen in other Emergent Mississippian phases. At a minimum, this increase would be indicative of the initial formation of regional networks. I also expect Woodstock phase settlements to cluster into integrated, multisite territorial entities that are differentiated from similarly clustered neighboring entities.

Although there is no current evidence to suggest the existence of administrative centers in the Woodstock phase, the coalescence of settlements into independent, small-scale polities suggests that autonomous villages were at least organizing into regional networks if not into a centralized political entity or polity. Thus, the evolution of political complexity in north Georgia may indicate a revision to Knight's developmental stages. In this region at least, the second stage of development may need to be divided into two sub-stages, in which the first sub-stage is characterized by site clustering but the absence of administrative centers. The second sub-stage, then, would be characterized by the clustering of multiple settlements around a single administrative center that exhibits platform mound construction, an arrangement that is certainly recognized as Mississippian.

1.3 Defining Mississippian

Critical to any discussion of Mississippian emergence is to first define Mississippian culture and to understand the adjustments that have been made to its definition over the past several decades as more data have become available for interpretation. The earliest applications of this term referred to the pottery styles of the central Mississippi Valley (Holmes 1886, 1903). By the 1950s, the concept of Mississippian had been expanded to include material culture traits such platform mounds, mound and plaza arrangements, wall-trench structures, and maize agriculture (Willey and Phillips 1958).

Benefiting from two decades of archaeological fieldwork, in the late 1970s and early 1980s application of the term Mississippian expanded to include not only specific construction features and ceramic forms but also environmental parameters and social and political structures. Analyzing settlement patterns of the lower alluvial valley of the Mississippi River, Bruce Smith suggested that Mississippian could be defined by settlement within the nutrient and resource rich flood plains of the meander-belt zone of major rivers, dispersed farmsteads surrounding a local center, and a ranked form of political (and social) organization (Smith 1978). Social ranking and political centralization are defining characteristics of a chiefdom level of organization (Earle 1987, 1991). Thus, Southeastern archaeologists commonly characterize Mississippian societies, particularly those of the sixteenth-century, as chiefdoms (Hally 1996; Milner 1996; 1998; Scarry 1994, 1996a; Steponaitis 1978).

Adding to the changes in the definition of Mississippian proposed by Smith, Griffin argued that determinations of Mississippian culture could be based on the common characteristics of increased population size and a settlement pattern consisting of ceremonial centers surrounded by large villages and farmsteads (1985). This pattern of site clustering develops because: (1) competition between neighboring chiefdoms leads to the creation of uninhabited buffer zones, and (2) administration within a chiefdom is more efficient when distances between settlements are small and the administrative center is centrally located (Hally 1993; Steponaitis 1978). Griffin also included participation in a region-wide belief system, which was ritualized through a shared iconography, and extensive trade networks through which ideas, raw materials, and finished products common in Mississippian culture moved (1985).

Walthall (1980) represents the common view that the Mississippian period was marked by the appearance of distinctive forms of pottery, which were commonly shell-tempered, and the construction of mounds that supported ceremonial or residential structures around a central plaza. He also included flood plain horticulture based on maize, beans, and squash, religious ceremonialism, long-distance trade, increased warfare, and the emergence of highly organized political systems as traits that characterize Mississippian. Inherent in this definition is the assumption that these highlighted patterns occurred regularly and without differentiation across the entire Mississippian Southeast. However, due to the various ways in which populations in the Southeast dealt with demographic, social, and environmental stresses, it is not surprising that subsistence practices, political structures and social organization were not uniform throughout the Mississippian Southeast (McElrath et al. 2000; Scarry 1996a).

The use of sweeping generalizations to understand the increasing complexity that is seen in the Mississippian period often minimizes the importance of local environmental circumstances and pre-existing forms of political or social organization in a particular region. More recent studies have examined the political nature of Mississippian society (Kelly 1992), addressing aspects of economy (exchange), political organization (hereditary chiefs), and ideology (iconographic complexes) within particular regions and with respect to local historical influences (Scarry 1996b).

For this dissertation, I define Mississippian societies as chiefdoms characterized by centralized political organization and intensive maize agriculture (Kelly 1992; Scarry 1996b). This definition excludes politically decentralized agricultural societies such as the Fort Ancient cultures of the middle and upper Ohio Valley (Wagner 1983, 2003) as well as nonagricultural politically centralized societies such as the Calusa of the Florida Coast (Widmer 1988).

1.4 Mississippian Origins

Various theories have been proposed to explain the shift in the Southeast from politically decentralized Woodland communities to chiefdoms with centrally organized leadership systems between A.D. 750 and A.D. 1050. This transitional period involved the emergence of generally comparable chiefdom level societies through roughly similar developmental pathways (Smith 1990). The nature of these developmental pathways has been the source of discussion and changing opinions as more data have been generated from contexts across the Southeast. Understanding the Mississippian emergence has focused on homologous explanations that regard similarities as a reflection of historical relatedness and analogous explanations that regard similarities as comparable adaptations by societies that were responding to similar stresses (Smith 1990).

Based on historical relatedness, homologous arguments place the Mississippian emergence in a nuclear area from which Mississippian groups, or at least ideas and material culture, spread rapidly across the Southeast (Willey and Phillips 1958). This nuclear core was hypothesized to be located in the central Mississippi and lower Ohio River valleys or the Tennessee-Cumberland regions because these were the only areas that had "any appreciable time depth" (Willey and Phillips 1958:165). Caldwell (1958) argued that the diffusion of Mississippian culture was driven by demographic pressure. Increasing population forced emergent Mississippian groups to expand along river valley corridors in search of prime land for growing maize. These migrating groups displaced or assimilated the groups they encountered on the way.

Support for this diffusionist model was provided by ceramic evidence from the Macon Plateau phase of central Georgia. Earlier phases were characterized by the dominance of complicated stamped designs. In contrast, pottery of the Macon Plateau phase was not dominated by complicated stamping but resembled early Mississippian types noted in areas far to the north in southeastern Tennessee (Willey and Phillips 1958). Similarly, Lewis and Kneberg (1946) explained the emergence of the Mississippian Hiwassee Island phase (A.D. 1000 to A.D. 1300) as the result of the migration of Mississippian groups into eastern Tennessee and the subsequent displacement or assimilation of the Late Woodland Hamilton (A.D. 800 to A.D. 1000) groups. Hamilton phase ceramics were characterized by grit and limestone tempering; the characteristic Mississippian use of shell tempering dominated the Hiwassee Island phase assemblage (Lewis and Kneberg 1946). Alternative explanations suggest that actual populations may not have been moving across the landscape but rather technological innovations, new crops, and new belief systems associated with this new Mississippian phenomenon spread along established communication and exchange routes.

Widespread similarities in Mississippian cultural characteristics may also be the result of "peer polity" interactions (Renfrew and Cherry 1986). On a regional scale, a polity is defined as the highest order political unit within that region (Renfrew 1986). Peer polities, then, are groups of autonomous societies that interact competitively through warfare and cooperatively through the exchange of commodities or valuables (Renfrew and Bahn 1991). The wide distribution of shell tempering, red-filming, and the addition of handles to ceramic vessels during the Mississippian period may point toward some sort of diffusion at least in terms of the imitation or borrowing of material culture or ideas between polities. Interacting in the absence of a centralized authority or a single, economically or militarily dominant polity, conflict is kept in balance through diplomatic institutions or rules (Barth 1969; McKivergan 1995). The ethnohistoric record documents that peer polity interactions among chiefdoms of the Southeastern United States were governed by diplomatic rules such as the use of symbolism or a shared ideology in which symbols have agreed upon meanings (McKivergan 1995). The occurrence of shell gorgets, copper ornaments, and other Southeastern Ceremonial Complex items in similar contexts across the Southeast in the Mississippian period reflects culturally regulated interactions between equal or near-equal polities.

In contrast, analogous arguments (those based on process) consider the widespread cultural and developmental similarities of Mississippian societies as independent and isolated cultural responses to similar challenges. For example, Muller (1986) suggests that Late Woodland societies, in similar river valley locations, with similar economies and organization, found similar solutions to problems such as population growth and resource stress, following parallel developmental pathways. In this line of thought, Schroedl et al. (1990) explain the Mississippian emergence in eastern Tennessee not as the displacement of Late Woodland groups by in-migrating Mississippian populations, but as the in-situ response to population growth through the intensification of maize cultivation and accompanying sociopolitical development.

The application of analogous arguments, in the context of an awareness of the history of particular regions, seems most appropriate for understanding the emergence of comparably complex political systems (i.e. chiefdoms) at approximately the same time, but through varying pathways, across the Southeast. In some areas of the Southeast, population pressure has been identified as the factor most strongly affecting variation in political organization. For example, in the American Bottom, growing populations necessitated a change in the subsistence program toward a greater reliance on resources such as maize whose yields could be increased with little additional input in labor (Earle 1984; Milner 1998; Rindos and Johannessen 1991). This subsistence shift resulted in the development of risk-managing chiefly political organizations (Ford 1974; Scarry 1993a; Scarry 1996b). Social pressure has also been identified as a factor of change, as competition for prestige leads to the intensification of crop production, resulting in increased demands for surplus production and the institutionalization of wealth-based status differences (Childe 1936, 1942; Earle 1997; Scarry 1993a; Scarry 1996b; Welch 1991).

Excavations at the Martin Farm site (40MR20) on the lower Little Tennessee River in eastern Tennessee provide a model for north Georgia as to what types of changes should be expected in an Emergent Mississippian phase. A transitional Late Woodland to Early Mississippian or Emergent Mississippian component was encountered and is denoted as the Martin Farm phase (A.D. 900 to A.D 1000). Ceramic analysis indicated that the Martin Farm ceramic assemblage was dominated by limestone tempered plain, limestone tempered cordmarked, and shell tempered plain ceramics (Schroedl et al. 1985). Limestone tempered loop handles are also present. A relatively equal proportion of limestone and shell tempered ceramics indicate that the Martin Farm occupation represents a transition from the preceding Late Woodland period that consisted predominately of limestone tempered ceramics to the succeeding Mississippian period that is dominated by shell tempered ceramics (Schroedl et al. 1985:243). Although there are notable changes in the respective ceramic assemblages toward greater diversity in the subsequent Early Mississippian Hiwassee Island assemblage, negligible differences in species composition and abundance of plant taxa occur between the two phases. In addition to native cultigens such as chenopod, and sunflower, maize was comparatively abundant in Martin Farm contexts.

Architectural evidence indicates that both wall trench and single-set post construction were employed and a single platform mound was constructed during this time. In conjunction with the construction of a single mound, the Martin Farm structural evidence suggests a "degree of site complexity heretofore assigned to later cultural manifestations" (Schroedl et al. 1985:460). Assessment of the patterning of Martin Farm phase sites (n=17) located throughout the lower Little Tennessee River valley indicates a preference toward settlement within close proximity (< 100 m) to flood plains. Most settlements appear to be small, residential sites, although this conclusion is based on "a general paucity of identifiable archaeological remains" (Schroedl et al. 1985:462). The changes that occurred during the Emergent Mississippian Martin Farm phase were related to agricultural intensification and increased social complexity. The Martin Farm data suggest that in eastern Tennessee the transition from Woodland to Mississippian occurred in less than a century.

An assessment of the kinds of political changes that occurred during the transition from the Late Woodland to Mississippian periods in north Georgia is currently lacking. This dissertation aims to develop a fuller picture of the interrelationships between changes in subsistence, settlement, and political organization that were occurring during the Woodstock phase and a better understanding of Mississippian origins in this region.

1.5 Placing the Woodstock Phase in Historical Context

The Woodstock phase (A.D. 800 to A.D. 1000) is chronologically placed between the Late Woodland Napier and late Swift Creek phases and the Mississippian Early Etowah phase in northern Georgia (Table 1.1). Flint River and Hamilton phases represent contemporary occupations in eastern Alabama and eastern Tennessee, respectively (Knight 1990:80; Schroedl et al. 1985:8).

Table 1.1 Culture sequences from the Georgia Ridge and Valley and adjacent areas.

		GA Ridge and Valley	Allatoona Reservoir	Guntersville Reservoir	Chickamauga Reservoir
A.D. 1600					
		Lamar[f]	Brewster[a]		
A.D. 1500	Late Mississippian			Crow Creek/ Gunterlands IV[e]	Dallas[c]/ Mouse Creek[c,d]
			Early Lamar[a]		
A.D. 1400	Middle Mississippian	Savannah[f]		Henry Island/ Gunterlands III[e]	
A.D. 1300			Wilbanks[b]		
A.D. 1200			Savannah[a]		
A.D. 1100	Early Mississippian	Late Etowah[f]	Etowah IV[a] III[a,b]	Langston/ Gunterlands III[e]	Hiwassee Island[c]
A.D. 1000		Early Etowah[f]	Etowah II[b] I[a]		Martin Farm[g]
A.D. 900		Woodstock[f]	Woodstock[a]	Flint River/ McKelvey/ Gunterlands II[e]	Hamilton[c,g]
A.D. 800	Late Woodland				
A.D. 700		Swift Creek / Napier[f]	Cartersville[a]		

[a] Caldwell 1957.
[b] Sears 1958.
[c] Lewis and Kneber 1941, 1946.
[d] Sullivan 1986.
[e] Walthal 1980; Webb and Wilder 1951; Heimlich 1952.
[f] Hally and Langford 1988.
[g] Lewis and Kneberg 1995.

The presence of Woodstock Complicated Stamped ceramics, as defined by Caldwell (1957), is used to differentiate Woodstock from earlier and later phases. Woodstock Complicated Stamped motifs fall stylistically between Swift Creek/Napier and Etowah Complicated Stamped motifs and indicate continuity in cultural development.

Woodstock exhibits both Late Woodland and Mississippian ceramic and non-ceramic characteristics and for this reason has been categorized by various archaeologists as either Late Woodland, Early Mississippian, or Emergent Mississippian (Hally and Rudolph 1986:29, 32; Lewis and Kneberg 1946; McElrath et al. 2000; Schroedl and Boyd 1991). Designation as Emergent Mississippian is appropriate because of the extensive excavation data that documents the importance of maize and the appearance of large, permanently occupied settlements (Anderson and Mainfort 2002a).

To understand how subsistence practices and the political landscape changed in north Georgia over the six hundred years between A.D. 600 and A.D. 1200, we need to determine the nature of food procurement, settlement, and political organization for the time periods represented in that span of time. Thus, the following three sections review existing settlement pattern, architectural, and subsistence data for each of the three time periods. To emphasize the transitional nature of the Woodstock phase, as certain Late Woodland elements continue to occur in conjunction with the addition of Mississippian traits, the time periods are presented in the following order: (1) general Late Woodland period, (2) general Mississippian period, and finally (3) the Woodstock phase.

1.5a Late Woodland Period

In northern Georgia, few Late Woodland period (A.D. 600 to A.D. 900) sites have been excavated, limiting our understanding of settlement patterns, socio-political organization, and subsistence practices. Based on ceramic styles, most Late Woodland period sites in northern Georgia are classified as Swift Creek (A.D. 600 to A.D. 750). Napier (A.D. 600 to A.D. 750) is also represented, but the center of Napier site distributions is located in central Georgia (Williams and Elliot 1998). Settlement pattern data show a tendency for Late Woodland sites to be located along major rivers rather than on tributaries (Cobb and Garrow 1996; Rudolph 1991) but do not reveal any tendency toward spatial clustering (Anderson 1996a). More data are needed to verify these patterns specifically for northwestern Georgia.

No definite Swift Creek structures have been identified, although a possible oval structure was excavated at Simpson's Field (38AN8) (Figure 1.2), located across the Savannah River in South Carolina (Wood and Bowen 1995). Only one Napier structure, represented by a rectangular posthole pattern on the summit of the Annewakee Creek Mound (9DO2), has been described. Annewakee Creek Mound is the only recorded Napier mound site in northern Georgia (Dickens 1975), but its position in the Late Woodland settlement system is unclear due to poor reporting of the site (Garrow 2000).

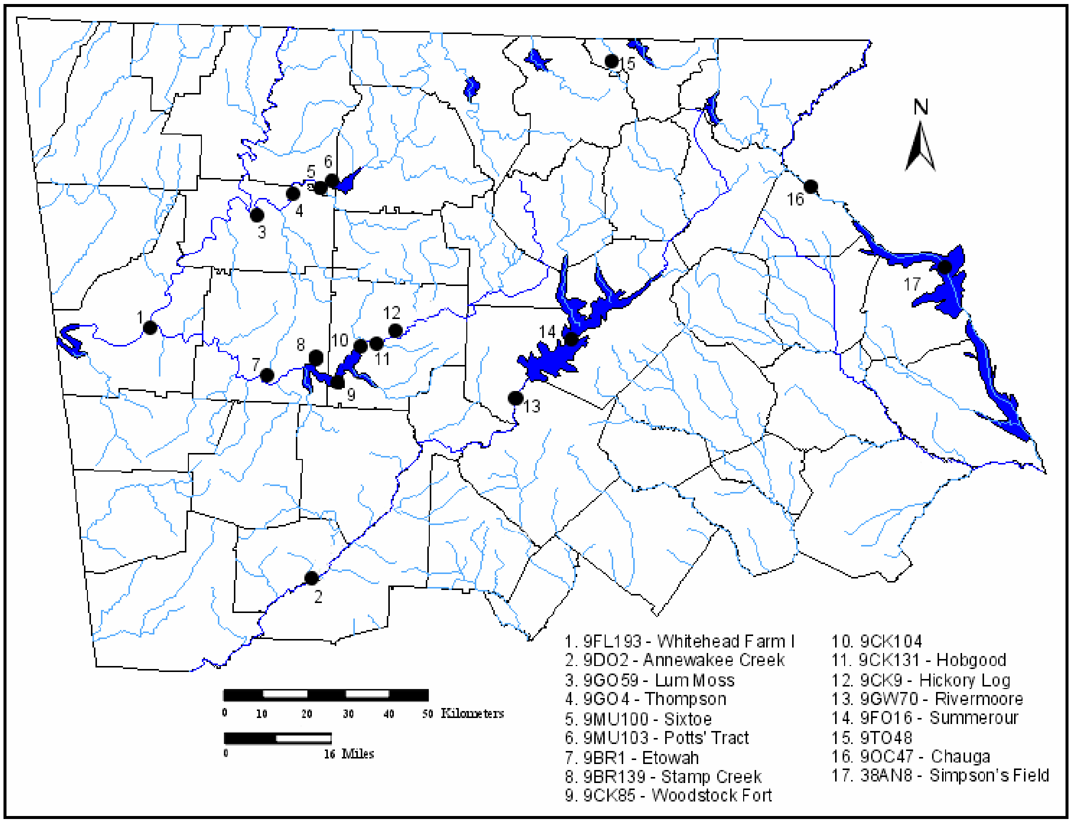

Figure 1.2 Location of sites mentioned in the text.

Although small amounts of cultigens have been recovered from these and other terminal Woodland contexts, there is no clear evidence of intensive cultivation of maize in northern Georgia (Rudolph 1991). The best subsistence data, including squash and sunflower remains comes from Simpson's Field (38AN8). In sum, a diffuse strategy of hunting, gathering and minor plant cultivation is suggested by the limited data currently available (Cobb and Garrow 1996; Cobb and Nassaney 1995; Wood and Bowen 1995:16).

1.5b Mississippian Period

The early Mississippian period in northern Georgia is represented by the Early Etowah phase (A.D. 1000 to A.D. 1200), which is defined by a greater number of excavated sites than the preceding phases. Thus, this phase is better known than late Swift Creek and Woodstock phases but not as well known as later Mississippian phases (Hally and Rudolph 1986). Shell and limestone tempered pottery, ramped platform mounds at Etowah (9BR1) and Sixtoe (9MU100) (Figure 1.2) and rectangular, wall-trench structures and round, single-post structures, are recognizable features of the Early Etowah phase (Hally and Langford 1986:51-55). Defensive fortifications were also common as evidenced by palisades at 9BR1 and 9CK9 (Figure 1.2) (Cable 2001; Cobb and Garrow 1996; Larson 1972; Webb, 2001). Although little evidence is available for Early Etowah subsistence practices, the dietary role of starchy and oily seed cultigens diminishes, and maize is found in a greater number of contexts than in the preceding Late Woodland period (Hally and Langford 1988).

Subsequent to the Early Etowah phase, many of these traits were elaborated upon throughout the Mississippian period in northwest Georgia and across the Southeast. Nucleated, palisaded, communities were built around central plazas that were dominated by one or more mounds (Lewis et al. 1998). Later Mississippian phases also exhibit site clustering; site hierarchies with habitation sites and platform mound centers; a town-and-dispersed-hamlet settlement pattern; wall-trench wattle-and-daub domestic architecture; and an increased reliance on maize. In Georgia the production of shell-tempered pottery was limited to the northwest portion of the state, in the Ridge and Valley district (Hally and Langford 1988).

1.5c Woodstock Phase

Our understanding of the Woodstock phase (A.D. 800 to A.D. 1000) is limited (Cobb and Garrow 1996). However, current settlement pattern data indicate that Woodstock sites are concentrated in the upper Piedmont of northern Georgia (Hally and Rudolph 1986). The settlement pattern data also appear to show longer-duration habitation sites on the flood plains of larger rivers and seasonal or specialized sites on the terraces and flood plains of smaller tributaries (Cobb and Garrow 1996). There exists a wide spectrum of site sizes, ranging from large villages (180,000 m^2) to small camps (3,300 m^2) and rockshelters. Some of the larger sites may have served important politically and socially integrative functions, but as yet there is no evidence for the type of site hierarchy typical of the later Mississippian period (Cobb and Garrow 1996).

Few architectural features have been documented. A Woodstock phase palisade has been documented at Hickory Log (9CK9) (Webb 2001) and Woodstock Fort (9CK85) (Caldwell 1957) (Figure 1.2). Palisades may also have existed at 9CK104 (Caldwell 1957) and 9TO48 (Cable 2000) but the assignment of palisades to these two sites is questionable. Only a portion of a palisade line was excavated in the project area at 9CK104 and the ceramic evidence does not definitively place the construction of the palisade at 9TO48 in the Woodstock phase. Only five sites (9CK104, 9CK131, 9CK9, 9GW70 and 9TO48) have yielded structures, which were probably of single-post wall construction (Cable 2000; Caldwell 1957; Hally and Rudolph 1986:31; Steve Webb, personal communication 2002; Webb 2001). Clear post patterns have been elusive. Cable (2000) argues that a possible community house has been excavated at 9TO48. It is located in Locus F in the approximate center of a palisaded area and has a large floor area of 104.55 m^2. Again, a small ceramic sample makes assignment of the structure to Woodstock uncertain.

The Summerour Mound (9FO16) (Figure 1.2) is the only known platform mound that may have been constructed during the Woodstock phase. Ceramic and feature data indicate that mound construction may have begun in the late Swift Creek phase, which is consistent with its strong resemblance to the Annewakee Creek Mound (Caldwell 1953; Cobb and Garrow 1996; Dickens 1975; Hally and Rudolph 1986; Pluckhahn 1996:191, 205). This early construction date does not preclude the use of the mound during the Woodstock phase, but no other definite Woodstock mound sites are known. A second mound center may have been located at Chauga (38OC47) where ceramic data indicate that mound construction activity occurred during the Woodstock phase (Anderson 1996a; Caldwell 1953).

The small, incurvate base, triangular Hamilton point is the point type typically associated with the Late Woodland period in North Georgia and Eastern Tennessee (Lewis 1955; Schroedl and Boyd 1991; Wauchope 1966). Late Woodland Triangular points have an equilateral triangle shape, straight or incurvate blade edges, and straight or slightly incurvate bases (Whatley 2002). Late Woodland Triangular points are smaller and thinner than earlier Middle Woodland points but larger than later Mississippian triangular types (Whatley 2002). The general similarity between the Late Woodland Triangular and Mississippian Triangular point types frequently makes distinguishing between them difficult. At Hickory Log (9CK9), Woodstock features were dominated by Late Woodland Triangular (Hamilton) points, but these points occurred in Mississippian features as well (Webb 2001). Equally important, Webb (2001) noted an association between triangular points and Napier and Swift Creek features. The points are larger than Hamilton points and have distinctive expanding sides.

A broad-spectrum subsistence strategy in which cultigens minimally supplemented the diet is thought to have characterized the Woodstock phase (Cobb and Garrow 1996). However, as will be described in later chapters, recent finds of macrobotanical maize remains at several Woodstock sites indicate that maize had become an important part of the Woodstock diet (Hally 1970; Hally and Langford 1988:52; Stanyard and Baker 1992). Further ethnobotanical analysis is needed from a greater number of Woodstock contexts to refine our knowledge of Woodstock subsistence practices.

1.6 Late Woodland to Mississippian Transition

In summary, the transition from the Late Woodland to the Early Mississippian is best understood by examining the changes that occurred during the Woodstock phase. This transition involved changes in subsistence strategies as indicated by the increasing cultivation of maize. This transition also involved political changes as is implicated by increasing political centralization. A critical analysis of the Woodstock phase should indicate when initial intensification of maize agriculture and initial political centralization of communities occurred. As such, this analysis is critical to understanding the beginnings of political complexity in north Georgia.

1.7 Organization of the Dissertation

The following chapters discuss in detail the changes in subsistence and political organization that I have determined to have occurred during the Woodstock phase.

Chapter Two provides the environmental landscape of the north Georgia study region and a discussion of the effects that these environmental parameters had on prehistoric farming practices. Chapter Three supplies detailed descriptions of the major sites discussed in the text, with particular emphasis on those sites whose collections were sampled for reanalysis of botanical remains or for Complicated Stamped motif analysis.

Chapters Five, Six, and Seven address changes in subsistence in the north Georgia study region through time. Chapter Five presents a reconstruction of Woodstock subsistence according to archaeobotanical analysis and includes both a literature review of previous botanical work, as well as results from new archaeobotanical analysis conducted on botanical collections from several Woodstock contexts. Chapter Six presents a reconstruction of the Woodstock vessel assemblage and the attendant implications this new reconstruction has for changing subsistence practices at the Late Woodland/Mississippian transition. Chapter Seven examines Woodstock site distributions to determine if settlement patterns changed in response to changes in subsistence practices (i.e. the intensification of maize cultivation) and in political structures (i.e. centralization).

Chapters Four and Eight address questions of political organization in the north Georgia study area by developing a clearer picture of the changing political landscape. Chapter Four presents a newly refined Woodstock ceramic chronology, detailing the methods of motif analysis that were used to generate Early and Late Woodstock sub-periods. In Chapter Eight, I discuss how this refined chronology allowed the determination of Early and Late Woodstock occupations in north Georgia, and, subsequently, the mapping of changes in settlement location and clustering for the Swift Creek, Woodstock, and Early Etowah phases.

Chapter Nine draws together the various conclusions of the previous chapters, furnishing a more complete understanding of the associations between subsistence changes and the elaboration of political systems in north Georgia.

CHAPTER 2

ENVIRONMENTAL SETTING

The area containing Woodstock occupations is comprised of the following physiographic regions: Cumberland Plateau, Southern Ridge and Valley, Southern Blue Ridge and the Southern Piedmont (Figure 2.1) (Clark and Zisa 1976).

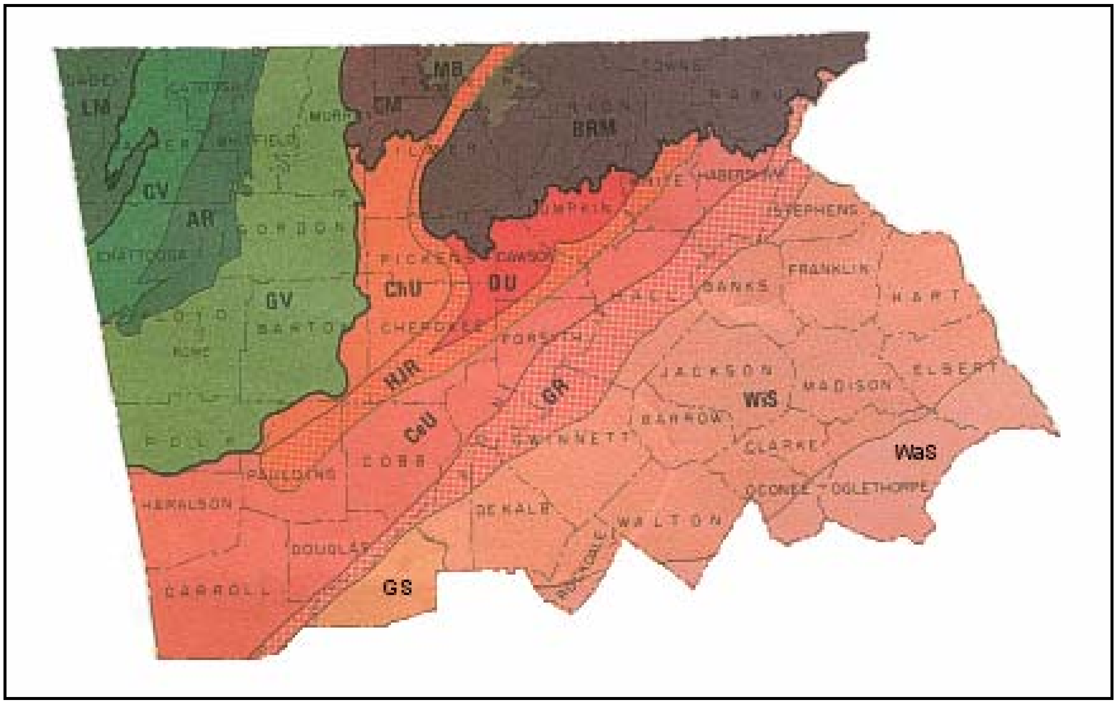

Figure 2.1 Physiographic regions of the study area (adapted from Clark and Zisa 1976).

Various factors affect the suitability of soils for the cultivation of maize and other crops. Differences in relief affect the development of soils. Soils on narrow ridges or steep slopes are subject to erosion, while those in flat valley floors may be considerably thicker. Changes in the water table and the deposition of less fertile soils washed from upland slopes can make fertile and productive bottomland soils less useful for farming. Such differences in the suitability of soils doubtless affected the farming practices of the Woodstock inhabitants in the north Georgia study area and their selection of land for cultivation.

In this chapter and throughout the dissertation, I use the term “upland” to denote the hilly terrain that lies adjacent to and beyond the flat valley floors. The valley floors and flood plains of major and minor streams will be referred to as “lowlands”. Flood plain soils are differentiated into first bottom and second bottom. First bottom denotes active stream flood plains, while second bottom refers to old flood plains, terraces, or benches. The first bottoms are the lowest lying and most recently formed alluvial soils, i.e. those that are still subject to being submerged by overbank flooding. Although first bottoms are generally level, often a narrow strip of slightly higher ground, the natural levee exists immediately adjacent to the stream bank (Bennett 1921). Second bottoms stand above the influence of an active stream, having formed before the active channel was cut, at a time when the stream flowed at a higher level. Second bottoms are generally flat, and well-developed terraces are separated from first bottoms by distinct scarp lines or steep slopes.

The physical properties of soils have a direct bearing on plant growth because they affect the depth of the root zone and the relationship of water and air within the root zone (Troeh and Thompson 2005). These properties are discussed in terms of depth, texture, porosity, and consistency. The uppermost layer of a soil profile, i.e. the topsoil or surface soil, is referred to as the A horizon and is developed through the accumulation of organic matter from roots and plant residues. The underlying layer of soil, or the subsoil, is denoted as the B horizon. The B horizon often has a higher clay concentration than the A horizon, as clay particles from the A horizon move downward with percolating water, and silt and sand weather to form clay within the B horizon (Troeh and Thompson 2005). The organically rich A horizon is more favorable for plant growth than the more clayey B horizon.

Texture relates to the relative proportions by weight of the three mineral fractions. The three fractions are classified according to the size of their particles and are denoted as sand (0.05 to 2 mm), silt (0.002 to 0.05 mm), and clay (< 0.002 mm). Sandy soils are generally permeable to air, water, and roots, but have a low water-holding capacity and are poor store houses for plant nutrients (Troeh and Thompson 2005). Constant addition of water and plant nutrients through irrigation and the application of fertilizers can improve the productivity of these soils, but often at high economic and energy costs. Clay soils have a high water-holding capacity and ability to store plant nutrients. However, clays have inadequate aeration and tend to stick to plows or other implements when wet and to become hard when dry. The finer particles in silty soils help bind soil particles together into structural aggregates that have high total pore space. Like sandy soils, silty soils are permeable to air, water, and roots; like clay soils, silty soils have a high water-holding capacity and ability to store plant nutrients (Troeh and Thompson 2005).

Loam is a mixture of sand, silt, and clay that exhibits the properties of each fraction about equally, but usually contains less clay than sand or silt (Russell 1973; Troeh and Thompson 2005). Clay properties are more strongly exhibited than sand or silt properties. The clay content allows adequate storage of water and plant nutrients for optimum plant growth. The sand content offsets the poor aeration and difficult workability of the clay. "Heavy" soils are high in clay; "light" soils are sands or loams. More energy is needed to plow and till clay soils as compared to sandy or loamy soils. Loams are the most desirable soils for the cultivation of maize and most crops in general (Troeh and Thompson 2005).

2.1 Cumberland Plateau

The Cumberland Plateau Section is comprised of the Lookout Mountain (LM) District. The district is defined by two flat-topped mountains, Lookout-Pigeon and Sand Mountains on the east and west, respectively, and is separated by Lookout Valley (Clark and Zisa 1976). The district slopes in a gentle southwest direction to an elevation of nearly 270 m near the Alabama border. The southeastern slope of Lookout Mountain drops abruptly into the Chickamauga Valley. The uplands are the source of many small streams that flow into the valleys below.

Soils on the mountain tops are classified as generally well-drained, fine sandy loams (Pehl and Brim 1985). Areas of deep fine sandy loam deposits support agricultural production. Soils in the Lookout Valley fall into one of three groups: well-drained silty clays, clays, or fine sandy loams (Pehl and Brim 1985). Pine and eastern red cedar dominate the forest cover; yellow poplar and sweetgum occur in addition to cedar and pine on the fine sandy loam soils.

The Cumberland Plateau receives about 133 cm of rainfall annually and experiences little variation in annual precipitation (Plummer 1983). Located in the upland and mountainous regions of northwest Georgia, this area is the first to be affected by approaching polar air-masses and has experienced the coldest temperature (-17˚ F) recorded for Georgia (Plummer 1983).

2.2 Blue Ridge

The Blue Ridge is divided into the Cohutta Mountains (CM), McCaysville Basin (MB), and Blue Ridge Mountains (BRM) districts. The McCaysville Basin separates the Cohutta Mountains to the west from the main body of the Blue Ridge which extends to the east. Although bisected by ridges that reach elevations of approximately 1,335 to 1,500 m, the McCaysville Basin is characterized by a gently rolling topography that varies in elevation from approximately 535 to 600 m (Clark and Zisa 1976). Both the Cohutta Mountains and Blue Ridge Mountains districts are dominated by rugged mountains that range in elevation from 1,000 to 1,570 m (Clark and Zisa 1976). A sharp change in regional slope occurs at the juncture between the Blue Ridge province and the Piedmont province to the south. The Blue Ridge Mountains are rather wet, receiving in excess of 175 cm of rainfall in the higher elevations. The wettest location in Georgia, Flat Top Mountain, is located in this region and regularly receives 218 cm or more of precipitation each year (Plummer 1983).

Soils of the Cohutta Mountains district are comprised of shallow stony loam soils of the Ashe and Edneyville series on the ridge tops and loams of the Tesquitee series at the base of the mountain slopes (Jordan et al. 1973). Only the Tesquitee soils of the gentle slopes are suited to farming (Jordan et al. 1973). The native forest was dominated by chestnut. Following the chestnut blight in the 1930s, northern red, white, and chestnut oak forests have replaced the chestnut. The McCaysville Basin is comprised of relatively deep, well-drained clayey soils that support yellow poplar and several species of pine.

The high mountain ridges of the Blue Ridge Mountains district possess shallow soils that overly bedrock (Pehl and Brim 1985); these soils are difficult to work and are better suited to hardwoods (McIntyre 1972). The juncture with the Piedmont province is characterized predominantly by stony loam soils of the Ashe, Edneyville, and Porters series (McIntyre 1972). Porters loams are the most extensive and important soils at this juncture (Bennett 1921) and correspond to the Cecil soils of the Piedmont (see Table 2.3). These soils are fairly productive and can yield about 20 to 75 bushels of maize per acre with intensive labor input. However, the average yield on the best land with good treatment is 35 bushels per acre (Bennett 1921:187).

2.3 Ridge and Valley

The Ridge and Valley is divided into the Chickamauga Valley (CV), Armuchee Ridges (AR), and The Great Valley (GV) districts. Situated between the Chickamauga Valley to the west and the Great Valley to the east and south, the Armuchee Ridges district is characterized by narrow ridges. In contrast, the Chickamauga Valley encompasses a series of northeasterly trending valleys that are separated by low, parallel ridges. The Great Valley is open and broad, with few ridges or hills (Clark and Zisa 1976).

Elevations in the Chickamauga and Great Valley districts range from 235 to 335 m; in the Armuchee Ridges, elevations range from 470 to 535 m (Clark and Zisa 1976). The Great Valley's eastern boundary follows the Great Smoky-Cartersville fault, where the metamorphic rocks of the Piedmont and Blue Ridge provinces have been thrust over the folded rocks of the Ridge and Valley province (Hunt 1967; Hurst 1970). The Valley supports an oak-hickory forest that was once dominated by chestnut (Pehl and Brim 1985).

Climate is generally uniform throughout the Ridge and Valley province. Average maximum and minimum temperatures from Gordon County in the Great Valley district are representative of the entire province, with an annul maximum of 70.6˚ F, and an annual minimum of 48.5˚ F. The area experiences an average of 215 frost free days (Bramlett 1965; Hally and Langford 1988). The province receives about 133 cm of rainfall annually and experiences little variation in annual precipitation (Plummer 1983).

The Chickamauga Valley district lies within the Tennessee River watershed. The Armuchee Ridges and Great Valley districts lie in the Alabama River watershed. The Armuchee Ridges are comprised of Gilpin, Dekalb, and Bodine series soils. These soils are stony clay loams (Bramlett 1965; Pehl and Brim 1985) that are poorly suited for agriculture (Hally and Langford 1988). Deciduous hardwood forests of oak and hickory predominate, but some pine species are present (Pehl and Brim 1985).

The Chickamauga Valley is characterized by long, narrow stretches of level or gently sloping floodplain and low terrace soils that are subject to frequent flooding. These alluvial soils are moderately to strongly acidic, easily worked, well suited to the cultivation of maize (Table 2.1). With intensive labor input, the silty loam aquic hapludult Whitwell and fluvaquentic dystrochrept Chewacla soils can produce between 85 and 100 bushels per acre, respectively (Tate 1978). The sandy loam typic hapludult

Rome and typic udifluvent Toccoa soils yield between 85 and 95 bushels per acre (Tate 1978).

The typic hapludalf Conasauga and typic paleudult Fullerton silt loam soils (Table 2.1) are located on broad ridgetops can produce as many as 60 bushels per acre with intensive inputs of labor. Along the steeper slopes, however, these same soils are subject to erosion and are not utilized for the cultivation of maize (Tate 1978). The sandy loams of the typic hapludult Hartsells series located on broad ridgetops yield between 70 and 85 bushels while the sandy loam Hartsells soils located on steeper slopes are not cultivated (Tate 1978).

Table 2.1 Average maize yields of the soils in the Ridge and Valley province[#].

Soil Series	**Location**	**Total Acreage**	**Arable Acreage**	**Improved Management[*]**	**Common Management**
		% of area	**% of area**	**bushels per acre**	**bushels per acre**
Chewacla	flood plain	4.8	4.8	85-100	Not reported
Monongahela	flood plain	2.5	2.5	35-45	20-25
Stendal-Philo	flood plain	3.6	3.6	100	45
Toccoa	flood plain	1.4	1.4	90	Not reported
Rome	flood plain	2.4	2.4	85-95	Not reported
Whitwell	flood plain	3.8	1.7	110-125	35-40
Christian	uplands	4.3	2.9	60-85	35-40
Clarksville	uplands	4.1	1.7	35-55	20-30
Conasauga	uplands	3.2	2.7	60	Not reported
Fullerton	uplands	4.0	1.4	45-80	20-30
Hartsells	uplands	1.6	0.9	70-85	Not reported
Klinesville	uplands	26.4	0.0	--	--
Montevallo	uplands	3.7	2.0	30-35	17-20
Rarden	uplands	1.9	1.2	32-40	18-20
Tallapoosa	uplands	3.2	0.0	--	Not reported

[#] Based on the *Soil Survey of Gordon County* (Bramlett 1965) and the *Soil Survey of Chatooga, Floyd, and Polk Counties* (Tate 1978).

[*] Indicates the use of fertilizers, high yielding crop varieties, soil-conserving cropping and water management systems, and the control of weeds and insects.

The broad, flat Great Valley floor is well drained with a high natural fertility and water-holding capacity. Although the native forest in this district was oak-hickory, with a predominance of pine on the ridge tops, most of the inter-ridge valleys have been cleared and cultivated (Pehl and Brim 1985). Rivers in the Great Valley, such as the Coosawattee, Etowah, and Coosa, generally flow west or southwest through wide alluvial valleys. The alluvial soils located along the larger flood plains of the rivers flowing through the Great Valley are low in acidity, easily worked, and well-suited for maize cultivation (Table 2.1) (Hally and Langford 1988; Smith 1992).

Located on low stream terraces, the podzolic Whitwell series soils have moderately well-developed horizons while the alluvial Stendal-Philo series, located on flood plains, have weakly developed soil horizons. Under common management, or cultivation that does not employ fertilizer or high yielding crop varieties, these silt loam soils yield between 35 and 40 bushels of maize per acre (Bramlett 1965). Comprising only 2.5% of the total acreage of the county, the soils of the well-developed podzolic Monongahela series are located on old stream terraces and benches. Monongahela soils are strongly acidic, low in natural fertility, and gravelly in contrast to the other Great Valley flood plain soils (Bramlett 1965).

Podzolic Christian series soils have well-developed horizons. The sandy loam soils of the Christian series are good general farming soils (Bennett 1921) and can produce between 35 and 40 bushels per acre. Less fertile soils are present along the scattered uplands, where the cherty silt loams of the well-developed podzolic Fullerton series yield 20 to 30 bushels per acre (Table 2.1) (Bramlett 1965). Even with intensive labor input, the silt loam soils of the podzolic Rarden series yield only 30 to 40 bushels per acre

(Bramlett 1965). Productive silt loam soils of the podzolic Muse and Leadville series occupy bench like areas at the foot of slopes, have moderately to well-developed soil horizons, and can yield between 25 and 40 bushels per acre (Bramlett 1965).

Following improved management practices such as controlling for erosion, the shallow typic dystrochrept Montevallo (Bramlett 1965) and typic rhoduldult Musella stony loam ultisols (Jordan et al. 1973) yield only a maximum of 35 bushels per acre. Clarkesville surface soils are predominantly silty, with abundant fragments of chert (Bennett 1921). Moderately developed podzolic Clarkesville subsoils are generally silty clay loam or silty clay (Bramlett 1965). The compact subsoil has inadequate drainage, severely compacts in dry weather, is deficient in organic matter and must be ditched for efficient use. Clarkesville soils rank as only moderately productive for maize cultivation (Bennett 1921).

2.4 Piedmont

The Piedmont province is divided into two subsections that are comprised of nine separate districts. The Upland Georgia Subsection contains the following five districts: Cherokee Upland (ChU), Dahlonega Upland (DU), Hightower-Jasper Ridges (HJR), Central Uplands (CeU), and Gainesville Ridges (GR). The Winder Slope (WiS), Washington Slope (WaS), and Greenville Slope (GS) districts comprise the Midland Georgia Subsection.

Upland Georgia Subsection

The northern portions of the Cherokee and Dahlonega Uplands are characterized by rough and hilly surfaces that range in elevations from 435 to 570 m and streams that occupy deep, narrow valleys 100 to 200 m below the surrounding ridges (Clark and Zisa 1976). The steep upland slopes of the Cherokee Uplands possess stony loam soils of the Ashe-Edneyville, Tallapoosa, and Talladega series (Table 2.2). The Edneyville, Tallapoosa, and Talladega series soils are classified as hapludults on ultisols with well-developed soil horizons, while the Ashe series are classified as dystrochrepts on inceptisols that exhibit less developed soil horizons (Jordan et al. 1973; McIntyre 1972). The steep, shallow soils of the ridges are difficult to farm and are better suited to woodlands.

The bases of the mountain slopes possess loams of the Tesquitee series which are humic hapludults on well-developed ultisols (Jordan et al. 1973). These soils are suited to the farming of row crops and yield between 80 and 90 bushels of maize per acre under improved management, which involves the use of fertilizers and high yielding crop varieties (Jordan et al. 1973). Unfortunately, there are no published estimates of crop yields under common management for these districts. The ridge tops of the Dahlonega Uplands are comprised of Edneyville-Porters and Ashe stony loams that are not suited to cultivation.

The gentle slopes and narrow ridge tops of the Cherokee Uplands are comprised predominantly of Madison and Hayesville sandy loams that are typic hapludults on well-developed ultisols (Table 2.2). With intensive labor input, these soils can yield 70 to 80 bushels per acre (Jordan et al. 1973). The gentle slopes and wide ridge tops of the Dahlonega Uplands are characterized mainly by Hayesville and Fannin sandy loams

(Table 2.2). The application of fertilizer to these typic hapludults allows for the production of 50 to 80 bushels per acre (McIntyre 1972).

Table 2.2 Average maize yields of the soils in the Upland Georgia subsection[#].

Soil Series	Location	Total Acreage	Arable Acreage	Improved Management[*]
		% of area	% of area	bushels per acre
Cartecay-Chewacla	flood plain	1.9[†]/3.4[#]	1.9[†]/3.4[#]	85-100
Congaree	flood plain	1.0[†]	1.0[†]	90
Masada	flood plain	1.8[†]/1.9[#]	1.6[†]/1.6[#]	65-75
Toccoa	flood plain	1.7[†]/1.7[#]	1.7[†]/1.7[#]	90
Wickham	flood plain	3.7[†]/2.7[#]	3.2[†]/0.8[#]	55-80
Ashe-Edneyville	uplands	5.5[†]	0.0[†]	--
Edneyville-Porters	uplands	7.5[†]/0.4[#]	2.8[†]/0.0[#]	50-65
Fannin	uplands	11.9[†]	11.7[†]	30-80
Hayesville	uplands	38.8[†]/11.2[#]	34.2[†]/3.1[#]	50-80
Madison	uplands	8.7[#]	2.1[#]	70-80
Musella	uplands	5.8[†]/0.7[#]	2.1[†]/0.0[#]	25
Tallapoosa	uplands	16.6[†]/37.6[#]	0.0[†]/0.0[#]	--
Tusquitee	uplands	7.8[†]/3.1[#]	3.6[†]/0.8[#]	80-90

† Based on the *Soil Survey of Dawson, Lumpkin, and White Counties* (McIntyre 1972).
# Based on the *Soil Survey of Cherokee, Gilmer, and Pickens Counties* (Jordan et al. 1973).
* Indicates the use of fertilizers, high yielding crop varieties, soil-conserving cropping and water management systems, and the control of weeds and insects.

Streams in the southern sections flow through relatively broad valleys. Located on nearly level soils of stream flood plains throughout the Cherokee Uplands district, clay loams of the Cartecay and Chewacla series can produce up to 85 bushels per acre (Table 2.2). Cartecay series soils are aquic udifluvents on younger entisols that have weakly developed soil horizons. Chewacla series soils are aquic fluventic dystrochreptic inceptisols (Jordan et al. 1973). The sandy loams of the typic udifluvent Toccoa series entisols can produce as much as 90 bushels per acre (Jordan et al. 1973). These soils occupy only 5% of the total acreage of the district, however. Soils on gently sloping uplands and terraces of older, higher stream channels are comprised of the Hayesville, Madison, Masada, and Wickham series (Table 2.2). Located along broad interstream divides and on narrow upland ridge tops, the Hayesville and Madison sandy loams yield 70 to 80 bushels under intensive management (Jordan et al. 1973). Level and gently sloping terraces are characterized by typic hapludult Masada sandy loams and Wickham loam ultisols that have well-developed soil horizons. Producing yields of 65 to 80 bushels per acre, these soils are better suited than other upland soils in the district to the cultivation of row crops.

The nearly level stream flood plains in the Dahlonega Uplands district consist of soils of the Cartecay, Congaree, and Toccoa series (Table 2.2). Per acre, the silt loam Congaree and sandy loam Toccoa soils yield 90 bushels of maize; the clay loam Cartecay soils yield 85 bushels of maize (McIntyre 1972). Located on wide ridge tops and toe slopes, the sandy loam Hayesville, Fannin, and Wickham soils yield between 55 and 80 bushels per acre (McIntyre 1972).

Typic udifluvent Congaree soils on entisols with weakly developed soil horizons (Table 2.2 and Table 2.3) are the most common bottom soils of the Piedmont, consisting mainly of silt loam, loam, and fine sandy loam. These soils are easy to cultivate and maintain and produce excellent yields of corn, often without the addition of fertilizer (Bennett 1921). Wickham loams (Table 2.2 and Table 2.3) are the second most common bottom soils of the Piedmont, are easy to cultivate and generally provide good yields of corn.

Midland Georgia Subsection

The Winder Slope, Washington Slope and Greenville Slope districts exhibit a gently rolling topography that gradually decreases in a north/northeast to south/southwest direction with elevations decreasing from 335 to 170 m (Clark and Zisa 1976). In the Greenville Slope, the Chattahoochee and Flint Rivers flow southwesterly toward the Gulf of Mexico through shallow, open valleys. In the Winder Slope and Washington Slope districts, the Savannah, Oconee, and Ocmulgee Rivers flow eastward to the Atlantic Ocean. The valleys of the Winder Slope district are deep and narrow, while those of the Washington Slope district are broad and shallow. The southern boundary of the Washington Slope is referred to as the Fall Line, or the point where the metamorphic rocks of the Piedmont abut the sedimentary deposits of the Coastal Plain. The Fall Line represents an imaginary line that connects major shoals along rivers as they enter the Coastal Plain (Clark and Zisa 1976; Hally and Langford 1988).

Precipitation in the Piedmont varies depending on the district. The Washington Slope district receives 125 to 138 cm of precipitation annually. The Greenville Slope district receives about 128 cm of rainfall per year and experiences the least variation in precipitation from year to year (Plummer 1983). The climate of the Piedmont varies by elevation. In the upland districts, summers are long and mild, and winters are somewhat cold; mountain slopes have an average mean annual temperature of 59˚ F (Jordan et al. 1973; McIntyre 1972). In the lower elevations, summers are long and hot, and winters are short and mild (Hally and Rudolph 1986).

The Winder Slope, Washington Slope and Greenville Slope districts are characterized by soils that are rich in iron and magnesium. Dramatic erosion caused by historic agricultural activity has altered soil depth and productivity differentially according to degree of slope. Soil surfaces are thinnest and thus the least productive on the steep slopes and only slightly thicker and more productive on the eroded lower slopes. Benefiting from the deposition of alluvium, flood plain soils are the most productive and provide easily tilled soil for the cultivation of subsistence crops.

In the Winder Slope district, alluvial soils located on nearly level flood plains can produce between 30 and 35 bushels of maize per acre (Table 2.3) (Thomas and Tate 1964). Although subject to flooding, the clay loam alluvial entisols of the Chewacla soils can yield 40 bushels per acre. Conversely, the poorly drained silt loam alluvial entisols of the Wehadkee series are heavy and difficult to till, making them less productive for maize cultivation and more suited to the cultivation of grains and grasses (Thomas and Tate 1964).

In the Greenville Slope, flood plains soils consist of Chewacla sandy loams and Congaree silt loam entisols with weakly developed soil horizons. These thin alluvial deposits are considerably dissected by drainageways (Walker et al. 1958). The shallow nature of the Chewacla soils in the steep V-shaped valleys of the Greenville Slope results in yields of only 20 bushels of maize per acre as compared to higher yields on the same soil series in the gently sloping Winder Slope district (Table 2.3). Well-drained podzolic sandy loam Wickham soils are present on low stream terraces. Located often only a few feet above the stream channel, these soils are impacted by frequent flooding and high fluctuations in the water table, resulting in reduced crop yields. Thus, in the Greenville Slope, these soils yield only 20 bushels per acre (Walker et al. 1958) under common management and are not well suited to the cultivation of maize.

Table 2.3 Average maize yields of the soils in the Midland Georgia subsection[#].

Soil Series	Location	Total Acreage	Arable Acreage	Improved Management	Common Management
		% of area	% of area	bushels per acre	bushels per acre
Winder Slope[#]					
Alluvial lands	flood plain	8.9	6.8	70-90	30-35
Chewacla	flood plain	1.6	1.6	85-100	40
Wehadkee	flood plain	0.9	--	--	--
Appling	uplands	16.7	16.4	40-70	20-35
Cecil	uplands	50.5	41.9	40-70	20-30
Lloyd	uplands	7.7	6.9	50-70	15-30
Greenville Slope[†]					
Chewacla	flood plain	2.4	2.4	45	20
Congaree	flood plain	1.8	1.8	50	20
Wickham	flood plain	0.3	0.3	45	20
Appling	uplands	14.2	12.2	10-35	5-15
Cecil	uplands	33.2	25.9	15-40	5-15
Lloyd	uplands	7.1	3.7	15-40	5-20
Madison	uplands	9.9	7.3	15-40	5-15

[#] Based on the *Soil Survey of Walton County* (Thompson and Tate 1964).
[†] Based on the *Soil Survey of Fulton County* (Walker et al. 1958).
[*] Indicates the use of fertilizers, high yielding crop varieties, soil-conserving cropping and water management systems, and the control of weeds and insects.

The uplands of the Winder Slope are comprised of Appling, Cecil, and Lloyd sandy loams (Table 2.3). The interstream ridges of the Greenville Slope are characterized by sandy loams of the Appling, Lockhart-Cecil, Lloyd, and Madison series. The Appling, Cecil, Lockhart, and Madison series soils are zonal podzolic soils that exhibit well-developed soil horizons; the Lloyd series are zonal lateritic soils with well-developed soil horizons (Thomas and Tate 1964; Walker et al. 1958). Gently sloping upland soils in the Winder Slope can produce 15 to 35 bushels per acre (Thomas and Tate 1964). In contrast, the steep slopes, ranging from 20-40%, of the ridges of the Greenville Slope result in soils that are poorly suited to the cultivation of maize, yielding only 5 to 20 bushels per acre (Walker et al. 1958).

Sandy loam, clay loam, and clay Cecil soils (Table 2.3) are important farming types (Bennett 1921). The clay loams and clay are present on slopes where the surface material has been washed away. The sandy loams and loam are present on smoother, less sloping surfaces (Bennett 1921). Sandy soils are more easily plowed than the clay soils but are not as productive as deeply, thoroughly plowed clay soils. Appling sandy loams (Table 2.3) retain moisture well and are more friable but less productive than Cecil soils.

Although large shoals are present only along the large streams in the Great Valley district of the Ridge and Valley province, shoals are located at intervals along all the major Piedmont streams; the abundant aquatic life present at these shoals contributed a substantial portion of the protein in the prehistoric diet (Hally and Langford 1988, Hally and Rudolph 1986; Shapiro 1990).

2.5 Implications of Environmental Setting on Prehistoric Farming Practices

Maize is grown predominantly in temperate climates that have warm summers but lack a distinct dry season. General limits exist with respect to low temperatures and low precipitation but there are no definite limits for high temperatures or high precipitation (Shaw 1955). The area of greatest production in the U.S. has a mean summer temperature of 70-80°F, at least 140 to 150 frost free days, and an annual precipitation of at least 10 inches (Shaw 1955:315). According to these parameters, maize can be cultivated productively in the Ridge and Valley and Piedmont Provinces of north

Georgia. The following discussion focuses on which soils are most productive for maize cultivation in these regions.

Loams are optimal for maize cultivation because they absorb water quickly with a minimum of surface runoff and retain a good supply of moisture without becoming water-logged. Additionally, loamy soils are generally deep enough for root penetration, have available supplies of plant nutrients, and are well aerated. In the Piedmont, Ridge and Valley, and Blue Ridge regions, the cultivation of maize is most productive on the well-drained silty and fine sandy loam bottom land soils (Bennett 1921). In terms of upland soils, maize cultivation is productive only on well-drained loams as opposed to stony or eroded clay soils (Bennett 1921).

Much of the acreage of the Blue Ridge Mountains is too mountainous to be cultivated. Cultivation on steep stony slopes is impossible. However, considerable erosion of the soils down the slopes has resulted in the accumulation of colluvial material and thus very desirable loamy soils on the smoother slopes that are easy to cultivate. The stony loams of the mountain tops and ridges of the Ridge and Valley and Piedmont regions are mostly forested because they are too gravelly and steep for cultivation.

Upland soils with slopes greater than 25% are not suitable for maize production because they are subject to erosion, which leads to excessive water runoff and shallow root zones. The gentle upland slopes, ranging predominantly between 2 and 15%, are less severely eroded and can maintain relatively thick root zones. Receiving the eroded runoff from surrounding uplands in the form of alluvium, flood plain soils have substantial root zones, are generally well-drained, and are highly desirable for maize cultivation. Soils located on the first terraces of bottom lands are preferable for maize cultivation because they are recurrently inundated by slow-moving flood waters (Stringfield 1955). Not all flood plain soils, however, are equally productive. Soils located the second terraces are not as desirable for maize cultivation because they are not recurrently inundated and replenished with nutrients by slow-moving flood waters. Soils located in low-lying or backswamp areas of first terraces are subject to ponding of the frequent flood waters. These heavy, poorly drained backswamp soils are not very desirable for maize cultivation, as "corn roots will not grow in waterlogged soil" (Stringfield 1955:347).

Studies in the Ridge and Valley region support the assertion that flood plain soils are more desirable for maize cultivation than surrounding upland soils. Before entering the Great Valley district, the tributaries of the Coosa, Conasauga, Coosawattee, and Etowah Rivers, flow through narrow valleys that generally have narrow flood plains (Hally and Langford 1988). Upon crossing the Cartersville Fault and entering the Great Valley, the alluvial flood plains expand considerably in width. Immediately below the fault, the alluvium is more coarse-textured than it is further down stream, and natural levees are larger (Hally and Langford 1988). The sudden reduction in stream gradient at the fault results in the periodic deposition of fresh alluvium immediately downstream, which replenishes soil nutrients removed by crops. Thus, the fertility of alluvial soils along the Conasauga, Coosawattee, and Etowah Rivers may be higher immediately below the fault due to the increased occurrence of over bank flooding.

Meyers (1995) also noted that the large tracts of level land along the major rivers in northwest Georgia are particularly well-suited to maize cultivation due to the renewal of nutrients through periodic over bank flooding. In contrast, only limited tracts of alluvial soils are present along the smaller streams of the Chickamauga Valley and Armuchee Ridges districts.

Although yields under common management were not provided in each county survey, the county soil survey data indicate that in the north Georgia study area, flood plain soils are better suited than upland soils to the cultivation of maize. The Monongahela flood plain soils of the Ridge and Valley (see Table 2.1) were not included in the average yields presented in Table 2.4 because they are subject to frequent flooding and do not represent the average flood plain soil present in the Ridge and Valley. Ashe, Edneyville, and Porters Piedmont soils (see Table 2.2) were also omitted from the averages presented in Table 2.4 because they are located on steep ridge tops and are not cultivated.

Table 2.4 Productivity of flood plain and upland soils by physiographic region.

Physiographic Region	**Improved Management**		**Common Management**	
	Flood plain*	**Upland***	**Flood plain***	**Upland***
Ridge and Valley	105	60	40	29
Piedmont – Upland Section	73	53	--	--
Piedmont – Midland Section *Winder Slope*	80	55	35	25
Piedmont – Midland Section *Greenville Slope*	48	25	20	13

* Average bushels of maize produced per acre.

Comparing yields under improved management practices, flood plain soils produce higher average yields of maize, ranging from an additional 20 bushels per acre to as many as 45 additional bushels per acre. Although not as large a difference, where yields under common management were provided, flood plain soils produced higher average yields than upland soils, ranging from an additional 7 to 10 bushels per acre.

CHAPTER 3

SITE DESCRIPTIONS

To understand how subsistence practices and the political landscape changed in north Georgia between A.D. 600 and A.D. 1200, we need to review existing settlement pattern, architectural, and subsistence data from the three periods. To this end, this dissertation draws on different types of information from numerous sites (Figure 3.1) across the north Georgia study area as well as from the Georgia Archaeological Site File database.

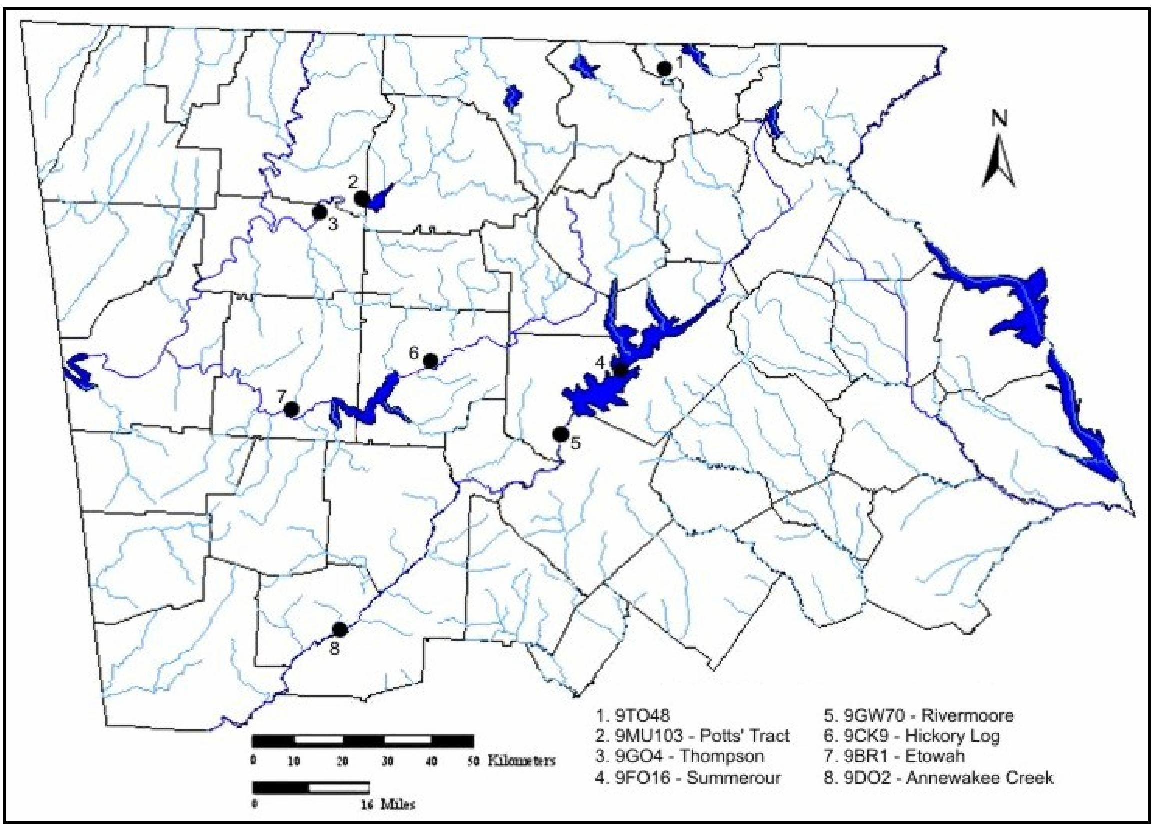

Figure 3.1 Location of sites discussed in the text.

This chapter describes the sites referenced throughout the dissertation and provides contextual information for the ceramic data used to construct the Woodstock ceramic sequence, botanical remains analyzed to assess changes in subsistence practices, and settlement and architectural data that provided a basis for determining changes in political systems.

3.1 Etowah Mound Center (9BR1)

The large, multi-mound Mississippian Etowah site is located on the Etowah River in Bartow County. Surrounded by a ditch and palisade on three sides, the 21 hectare site boasts six platform earthen mounds designated as Mounds A through F, a plaza, and a large habitation zone. The fourth side is bordered by the Etowah River (Figure 3.2).

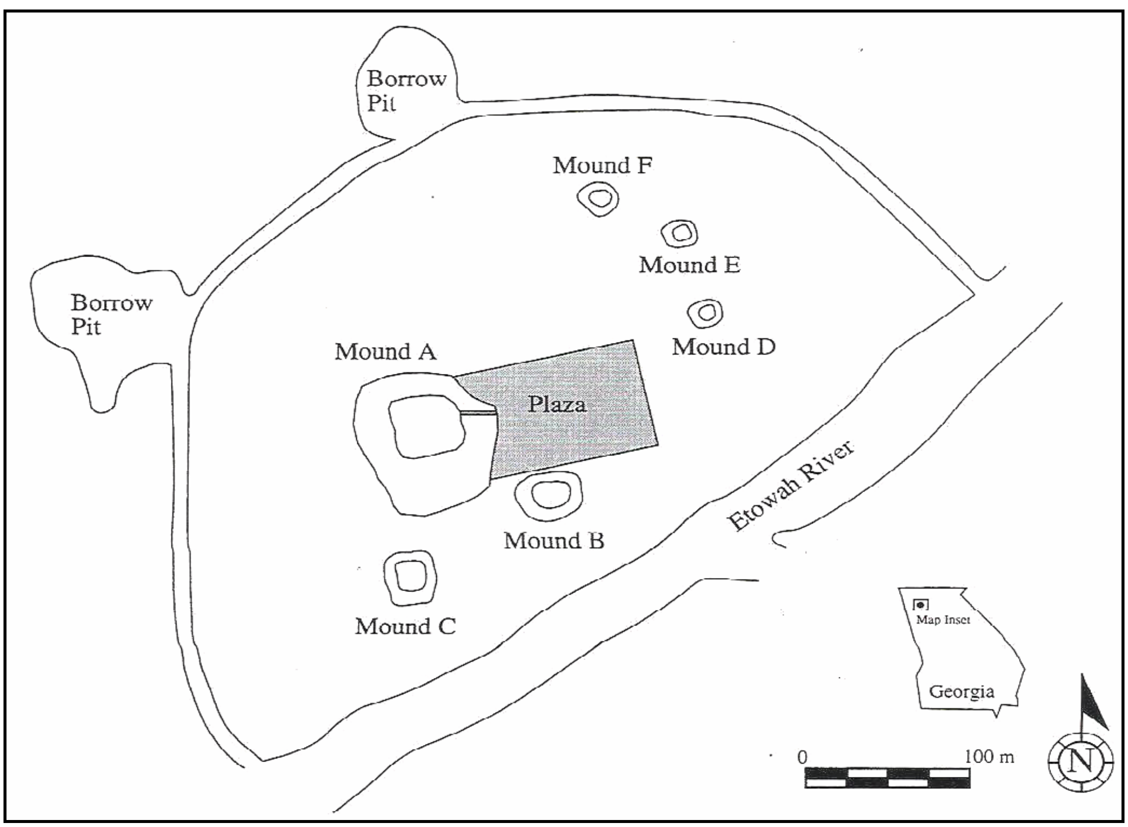

Figure 3.2 Plan map of the Etowah site (original image from King 2001a:Figure 1).

The Etowah site has seen over a century of archaeological research, beginning with the 1883 testing of Mounds B and C by archaeologists from the Smithsonian Institution's Mounds Division of the Bureau of Ethnology (King 2001a). In 1925 Moorehead's extensive excavations of Mound C burials yielded high status items and testing of Mound B indicated probable summit structures (King 2001a). Wauchope followed with excavations limited to a small area in the habitation zone subject to flooding by the Etowah River (King 2001a).

The following four decades were characterized by more systematic excavations. These excavations provide the basis for much of our current understanding of the Etowah site. In the 1950s, Sears focused excavation on intermound areas. He refined the ceramic sequence, delineated village areas, and located an artificial plaza that was constructed to the east of Mound A (King 2001a). Lewis Larson finished excavating the areas of Mound C (Figure 3.3) that Moorehead had not excavated. Arthur Kelly's excavations adjacent to Mound B revealed one summit structure and four pre-mound structures (Kelly and Larson 1957). During the 1960s and 1970s Larson excavated portions of the plaza and habitation area east of Mound A and tested Mound D. A trench across the ditch produced evidence for a bastioned palisade (King 2001a; Larson 1972).

Archaeological investigation during the 1980s and 1990s has been limited to projects directed at collecting data before the onset of various construction projects. Prior to the construction of the site museum in 1980, the proposed area north of the ditch was tested (King 2001a). Intensive surface collecting between Mounds D, E, F, and the ditch was undertaken in 1987 (King 2001a). Construction of visitor access stairs prompted testing at the base and on the summit of both Mounds A and B in 1995 (King 1995).


Figure 3.3 Reconstructed Mound C at Etowah (9BR1).

Currently available archaeological information suggests that during the Early Etowah phase (A.D. 1000 to A.D. 1100) occupation was concentrated along the edge of the river between Mounds B and C (King 2001b). Although no evidence exists for mound building during this stage, indirect evidence indicates that the construction of Mound A may have begun during this time (King 2001b). Kelly's excavations of Mound B uncovered four large, midden-filled pits, designated as Saucers 1 through 4, beneath a dark, Late Etowah midden (Black Midden) that occurred throughout the Mound B excavation area and under the mound (Figure 3.4) (King 2001a). Ceramic analysis of the saucers indicated that all dated to the Early Etowah phase; however, the presence of some Late Etowah diagnostics suggest some mixing of the saucer fills (King 2001a).

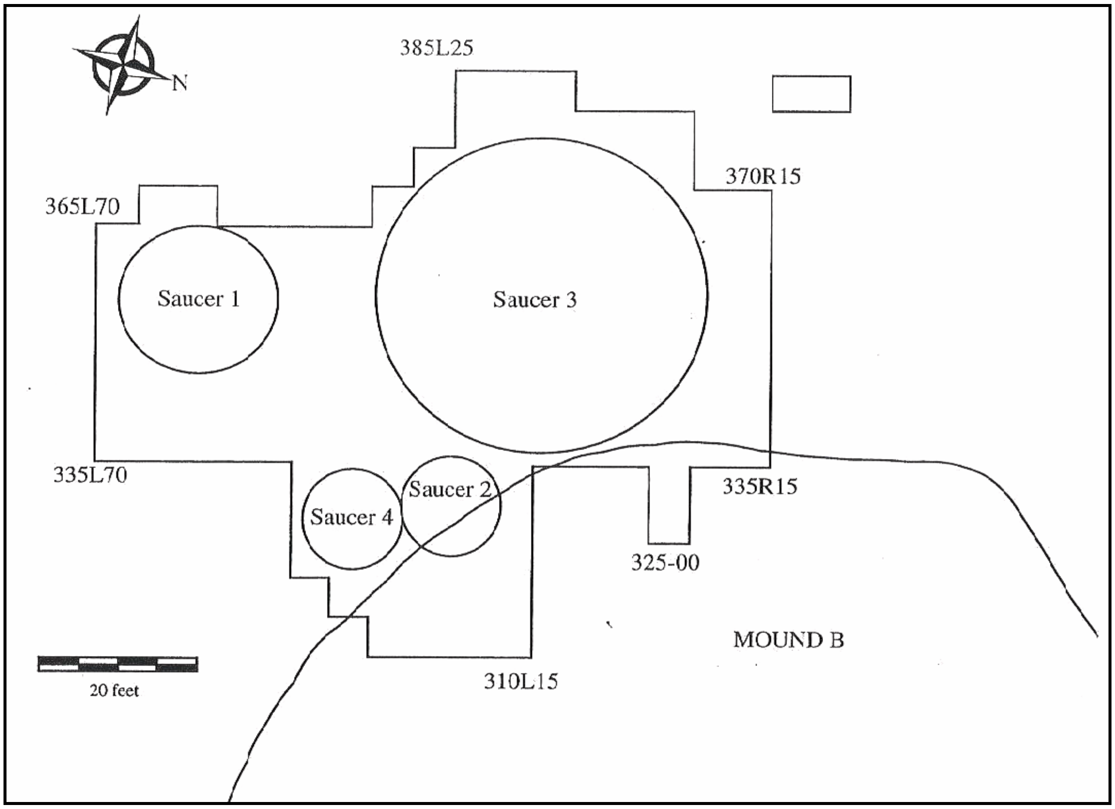

Figure 3.4 Location of midden-filled "saucers" at Etowah (from King 2001a:Figure 20).

To confirm the Early Etowah assignment, King obtained radiocarbon dates (Table 3.1) from soot on sherds recovered from near the top and bottom of each saucer (2001a). Radiocarbon dating confirmed the assignment of Saucer 1 to the Early Etowah phase (Table 3.1). Dates from Saucers 2, 3, and 4, however, were more complex as Kelly's 1958 excavations failed to make detailed records of level thicknesses and proveniences. A single radiocarbon date indicates a Late Etowah assignment for Saucer 2. However, the incongruity with the Early Etowah ceramic assignment may be understandable, as Kelly's crew "had some difficulty distinguishing the Late Etowah midden from the saucer fills stratigraphically" (King 2001a:70). The sherd sample from the *floor* of Saucer 3 (Beta-145491) returned a radiocarbon age of 900 ± 40 B.P. and a calibrated age of A.D. 1040 to A.D. 1209 at 1-sigma probability (King 2001a:71). This date between the end of the Early Etowah phase and beginning of the Late Etowah phase corresponds to the ceramic analysis (King 2001a). Saucer 4 returned both Early and Late Etowah dates, which may reflect layering of deposits throughout the Etowah phase. To date, no Woodstock features have been identified, and only two Woodstock Complicated Stamped sherds have been reported (one each from Saucer 1 and 2) (King 2001a).

Table 3.1 Radiocarbon dates for features from midden-filled saucers at Etowah.

Sample ID	Feature	Radiocarbon Age (YBP)	Calendar Date[a] (A.D.)	-1σ	+1σ
Beta-144161	**Saucer 1**	990	1023	1003	1148
Beta-145489	**Saucer 1**	1000	1021	1000	1145
Beta-144162	**Saucer 2**	830	1218	1165	1260
Beta-144164	**Saucer 3**	810	1224, 1231, 1239	1211	1275
Beta-145491[b]	**Saucer 3**	900	1160	1040	1209
Beta-144163	**Saucer 4**	850	1212	1161	1242
Beta-145490	**Saucer 4**	1080	981	899	1015

[a] Calendar dates from King's radiocarbon analysis (2001a:Table 16).
[b] Sample from the sample recovered from the floor of Saucer 3.

3.2 Summerour Mound (9FO16)

The Summerour Mound site is located beneath the waters of Lake Lanier (previously Buford Reservoir) on the Chattahoochee River in Forsyth County. The site was investigated by members of the Smithsonian Institution River Basin Survey in 1951 prior to the construction of the flood control dam that inundated the site (Caldwell 1953). Testing and excavation by the River Basin Survey crew, led by Joseph Caldwell, identified an earthen mound and surrounding habitation area. Excavations indicated the mound was approximately 2 m in height, 70 m in length, and 46 m in width and was erected in a single stage of construction (Caldwell 1953). Caldwell (1953) identified the majority of sherds recovered from building contexts as Woodstock Diamond Stamped and assigned them to an Early Woodstock occupation (Caldwell n.d.). Although the presence of an unidentified plainware and three carved sherd discs suggested a post-Early Woodstock mound occupation, Caldwell (1958) identified the mound as a Woodstock construction. The habitation area was not excavated. Additional investigations were conducted by Clemens de Baillou and Arthur Kelly (Pluckhahn 1996). Although de Baillou excavated two units in the village area in 1954, his published descriptions were lacking, and the location of artifact collections is unknown (Pluckhahn 1996). No documentation exists for Kelly's purported 1958 excavation of a trench on the north side of the mound.

Pluckhahn (1996) reexamined the notes and artifacts from Caldwell's 1951 excavations to determine the timing of mound construction. Plain sherds dominate the ceramic collection, while Swift Creek and Napier Complicated Stamping comprise the most common decorative types (Pluckhahn 1996). Pluckhahn's comparison of the Summerour ceramic data with the Annewakee Creek Mound site (see Figure 1.2) located farther south on the Chattahoochee River revealed that the frequencies of ceramic types were similar. A Napier Complicated Stamped sherd and a date of A.D. 755 from a pit on one of the mound's platform layers indicate that the Annewakee Creek mound was constructed during the Late Woodland period. Pluckhahn (1996) suggests the location of this Late Woodland mound site reasonably nearby places the construction of the Summerour mound in the Late Woodland period.

A rectangular structure (5.5 x 5 m) constructed of small posts set into wall trenches (Figure 3.5) was exposed on the mound summit (Caldwell 1953). Evidence for a projecting entrance passage was located near the corner of the northwest wall. A linear arrangement of postholes along the interior of the southwest wall was interpreted as a seating area or alcove. Two small fire basins were located on each side.

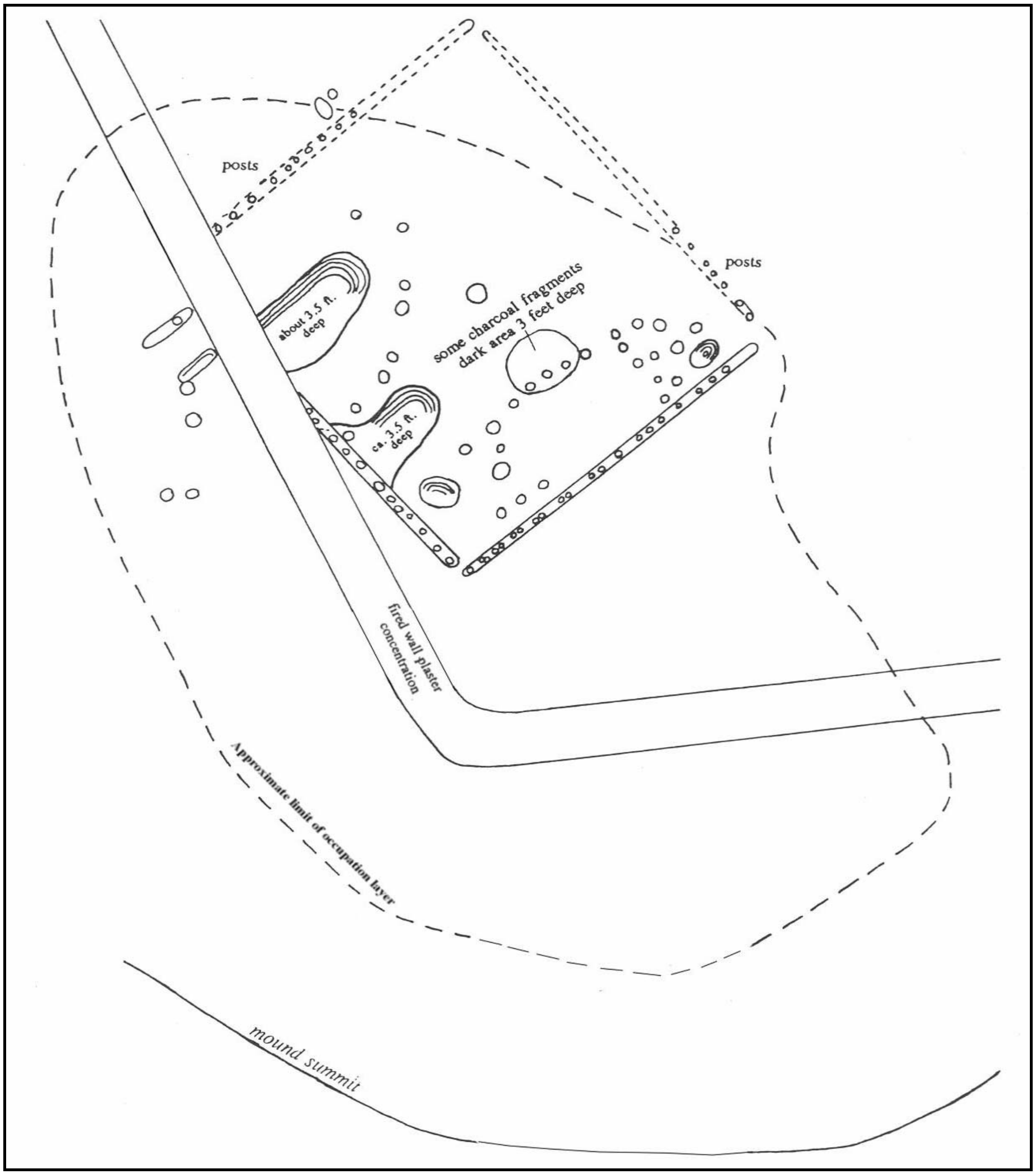

Figure 3.5 Structure on mound summit at Summerour (9FO16) (adapted from Pluckhahn 1996:Figure 8).

In his reexamination, Pluckhahn submitted a small portion of a fired earth and burned wood sample Caldwell had collected from one of the fire basins located on the southwestern wall. The sample (Beta-82594) yielded a radiocarbon age of 1150 ± 70 B.P. (Pluckhahn 1996:198). At a 1-sigma probability, the calibrated age falls between A.D. 800 and A.D. 985 and supports a Woodstock association. However, at a 2-sigma probability, the calibrated age widens to A.D. 705 to A.D. 1020, supporting the assertion that construction of the mound at Summerour began during the Late Woodland period.

3.3 Large Villages

3.3a 9CK9 (Hickory Log)

Hickory Log is a large, multi-component occupation site located on the Etowah River in Cherokee County (see Figure 1.2). The Woodstock component was first recognized by Wauchope in the late 1930s on the basis of six Woodstock stamped sherds (1966). The site was relocated and tested by TRC Garrow and Associates in 1994 prior to the construction of a Wal-Mart shopping center at the site's location. TRC Garrow and Associates conducted data recovery in the summer of 1995 (Webb 2001). Hickory Log was occupied from the Early Archaic through the Early Historic Cherokee periods. No Etowah and very few Swift Creek sherds were recovered from extensive excavations that covered 4.03 acres exposed by mechanical stripping. The Napier phase is represented by a single pit feature (Table 3.2) in the southern locus (Figure 3.6).

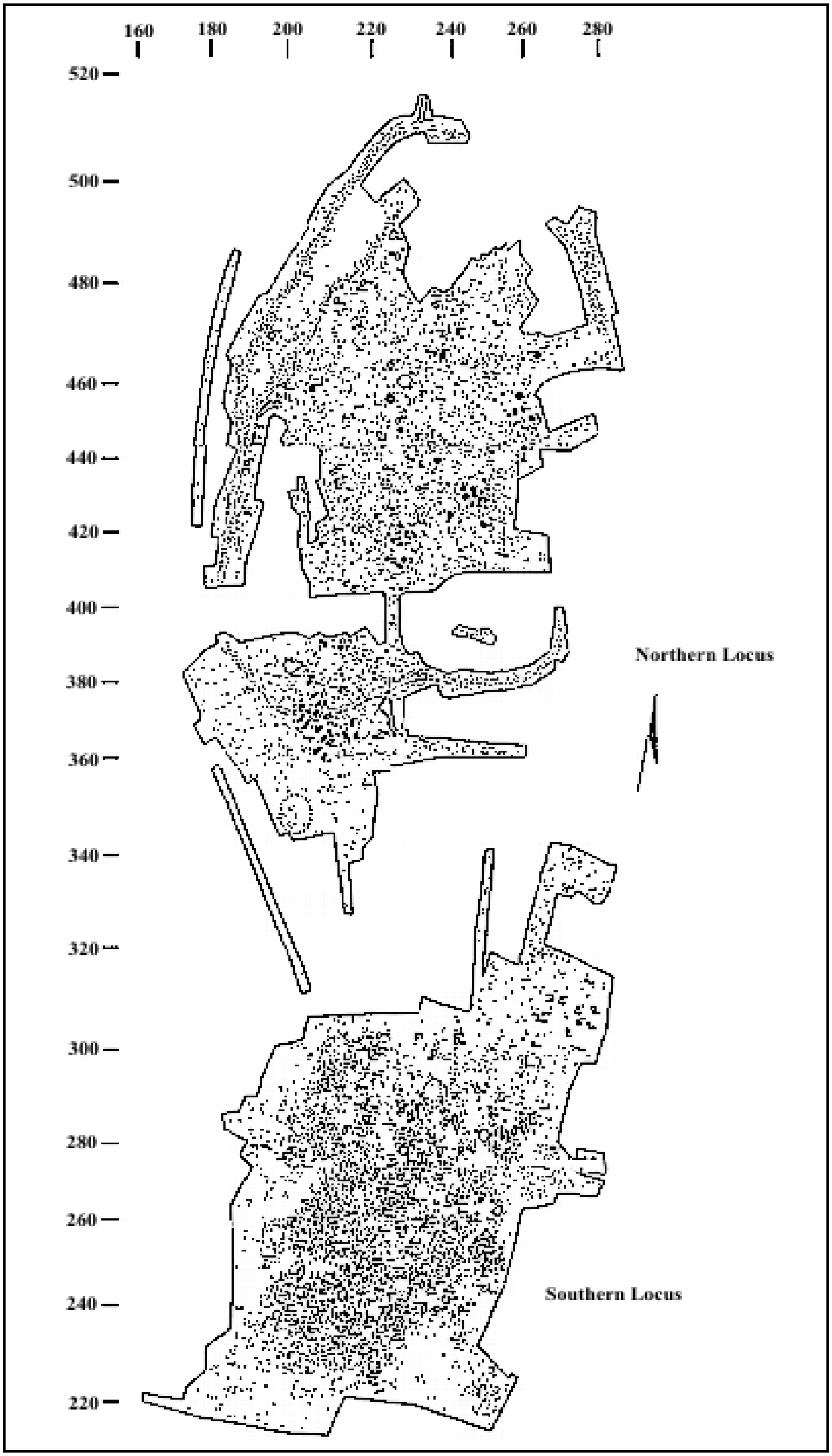

Figure 3.6 Excavated features at Hickory Log (9CK9).

Table 3.2 Description of the Napier feature in the southern locus at 9CK9.

Feature	Description	Artifact Inventory	Counts
1031	*Circular refuse pit*	Napier Complicated Stamped Bowl	1
		Napier Complicated Stamped	4
		Unidentified Simple Stamped	3
		Unidentified Check Stamped	8
		Late Woodland Triangular PPK	2
		Soapstone Fragments	2

The northern locus (Figure 3.6) exhibits a complex occupational history. The major occupation, identified as Late Woodland by Webb (2001), is represented by large numbers of Woodstock features such as post holes, pits, and palisade lines (Table 3.3). A few features, e.g. Features 7010, 7902, and 9645, contain late Swift Creek and Swift Creek B-Complex, as well as Woodstock ceramics. Swift Creek B-Complex ceramics are usually considered to represent a late manifestation of the Swift Creek phase contemporary with the Napier phase in north Georgia (Rudolph 1991). Separating the Late Woodland occupation in the northern locus into definitive Swift Creek and Woodstock components is not tenable. Instead, the co-occurrence of Swift Creek and Woodstock sherds in several pit features and the co-occurrence of a small number of pit features having only sherds identifiable as Swift Creek Complicated Stamped in the context of a majority of Woodstock features suggests that a single component is represented. This component is considered to date early in the Woodstock phase. As no Woodstock features were discovered in the southern locus, the following discussion pertains only to the northern locus.

Table 3.3 Hickory Log (9CK9) features by cultural period.

Cultural Period	Type of Feature	Count	Location
Napier	Refuse-filled pit	1	Southern Locus
Swift Creek	Refuse-filled pit	1	Northern Locus
	Burial/possible burial	4	Northern Locus
Woodstock	Refuse-filled pit	8	Northern Locus
	Burial/possible burial	8	Northern Locus
UID Late Woodland	Hearth/Earth oven	1	Northern Locus
	Burial/possible burial	22	Northern Locus
	Indeterminate feature	4	Northern Locus

Webb (2001) tentatively assigned four burials to the Swift Creek phase (Table 3.4) based in three cases on a single diagnostic sherd and, in the fourth case, on its proximity to the other burials. Determination of features as burials was based on the presence of human remains in three cases (Features 6119, 6962, and 6971), and a ground stone pendant and its proximity to a cluster of confirmed burials in the fourth case (Feature 6967). The Swift Creek refuse-filled pit, Feature 7010 (Table 3.4), contained only five diagnostic Swift Creek Complicated Stamped sherds out of 298 sherds larger than half and inch (Webb 2001).

Table 3.4 Features in the northern locus at 9CK9 identified as Swift Creek by Webb.

Feature	Description	Artifact Inventory	Counts
6119*	*Circular burial pit*	Swift Creek Complicated Stamped Jar	1
		Unidentified Complicated Stamped	1
		Hamilton/Late Woodland PPK	1
6962*	*Oval, midden-filled pit*	Swift Creek Complicated Stamped	1
		Unidentified Complicated Stamped	2
		Unidentified Simple Stamped	1
		Unidentified Check Stamped	4
		Unidentified Plain	21
		Hamilton/Late Woodland PPK	1
6967*	*Circular, possible burial pit*	Swift Creek Complicated Stamped?	1
		Unidentified Complicated Stamped	2
		Unidentified Incised	1
		Unidentified Check Stamped	1
		Hamilton/Late Woodland PPK	1
		Soapstone sherd	1
6971	*Circular burial pit*	Swift Creek Complicated Stamped	1
		Unidentified Complicated Stamped	1
		Unidentified Simple Stamped	1
		Unidentified Plain	21
7010*	*Oval refuse pit*	Swift Creek Complicated Stamped Jar	1
		Swift Creek Complicated Stamped	5
		Swift Creek B-Complex Stamped	1
		Unidentified Incised Bowl	1
		Unidentified Incised Beaker	2
		Woodstock Incised	1
		Woodstock Plain	1
		Woodstock Complicated Stamped	1
		Soapstone sherd	1
		Hamilton/Late Woodland PPK	2
		UID Late Woodland Triangular PPK	2
		Metate/Pitted Stone	2

* Features from which flotation samples were analyzed for subsistence reconstruction.

Of a total of 49 Late Woodland features located in the northern locus (see Table 3.3), 16 can confidently be identified as affiliated with the Woodstock occupation (Table 3.5). The majority of the large Woodstock pit features occur immediately within the palisade line (Figure 3.7). Determination of features as burials (Table 3.6) was based upon the presence of human remains in five cases (Features 1064, 1069, 6345, 6348, and 8301) and on pit form and fill characteristics in three cases (Features 6116, 6346, and 6349) (Webb 2001).

Table 3.5 Features in the northern locus at 9CK9 identified as Woodstock by Webb.

Feature	Description	Artifact Inventory	Counts
6227*	*Large, oval pit*	Woodstock Complicated Stamped	1
		Woodstock Plain	2
6330*	*Small, circular refuse pit*	Woodstock Complicated Stamped	3
		Woodstock Plain	2
7505*	*Small, circular refuse pit*	Woodstock Complicated Stamped	4
		Woodstock Plain	1
7902*#	*Large, oval refuse pit*	Woodstock Complicated Stamped Jar	4
		Woodstock Complicated Stamped	59
		Swift Creek B-Complex Stamped	1
		Hamilton/Late Woodland PPK	4
		UID Late Woodland Triangular PPK	1
		Pitted Stone	1
8052*	*Shallow, circular refuse pit*	Woodstock Complicated Stamped	1
		Unidentified Complicated Stamped	2
		Unidentified Plain	1
9208*	*Circular refuse pit*	Woodstock Complicated Stamped	7
		Unidentified Complicated Stamped	14
		Unidentified Plain	6
9635*#	*Borrow pit*	Woodstock Complicated Stamped Jar	7
		Woodstock Complicated Stamped	69
		Woodstock Plain	11
		Hamilton/Late Woodland PPK	9
		Slate Bar Gorget	1
		Diabase Disk	1
9645*#	*Borrow pit*	Woodstock Complicated Stamped	16
		Woodstock Incised	1
		Woodstock Plain	8
		Swift Creek Complicated Stamped	1
		Hamilton/Late Woodland PPK	11
		Celt/adze fragment	2
		Worked Schist fragment	2

* Features from which flotation samples were analyzed for subsistence reconstruction.
# Features from which ^{14}C samples were taken.

Table 3.6 Burials in the northern locus at 9CK9 identified as Woodstock by Webb.

Feature	Description	Ceramic Inventory	Counts
1064	*Oval burial pit*	Woodstock Complicated Stamped	1
1069	*Oval burial pit*	Woodstock Complicated Stamped	2
		Woodstock Plain	2
		Unidentified Complicated Stamped	4
6116[*]	*Oval pit; possible burial*	Woodstock Complicated Stamped	3
		Unidentified Plain	4
		Hamilton/Late Woodland PPK	1
6345	*Oval burial pit*	Woodstock Complicated Stamped?	1
		Unidentified Plain	8
6346	*Oval pit; possible burial*	Woodstock Complicated Stamped	1
6348	*Slightly oval burial pit*	Woodstock Complicated Stamped	1
		Unidentified Complicated Stamped	3
6349	*Slightly oval; possible burial pit*	Woodstock Complicated Stamped	1
		Unidentified Plain	8
8301	*Circular burial pit*	Woodstock Complicated Stamped	1
		Unidentified Plain	1

[*] Features from which flotation samples were analyzed for subsistence reconstruction.

Ceramic analysis of approximately 250 cross-sectioned posts along the southwestern corner of the palisade line yielded three Woodstock Complicated Stamped, one incised, and 39 plain sherds. Five Woodstock features [Features 6227, 7902, 9208, 9635, 9645] located within a 55 m strip inside the inner palisade line may have served as daub extraction pits for the construction of the palisade; these pits were later filled with refuse (Webb 2001). Considering a life span of about five to 10 years per palisade line and the evidence for reconstruction of portions of the palisade in the northern locus, the entire palisade probably had a life span of 15 to 30 years (Webb 2001). In conjunction with the ceramic data, a radiocarbon date of A.D. 710 to A.D. 990 obtained from charcoal from a post in the southern palisade line indicates that the palisade was constructed and used during the Woodstock phase occupation (Webb 2001).

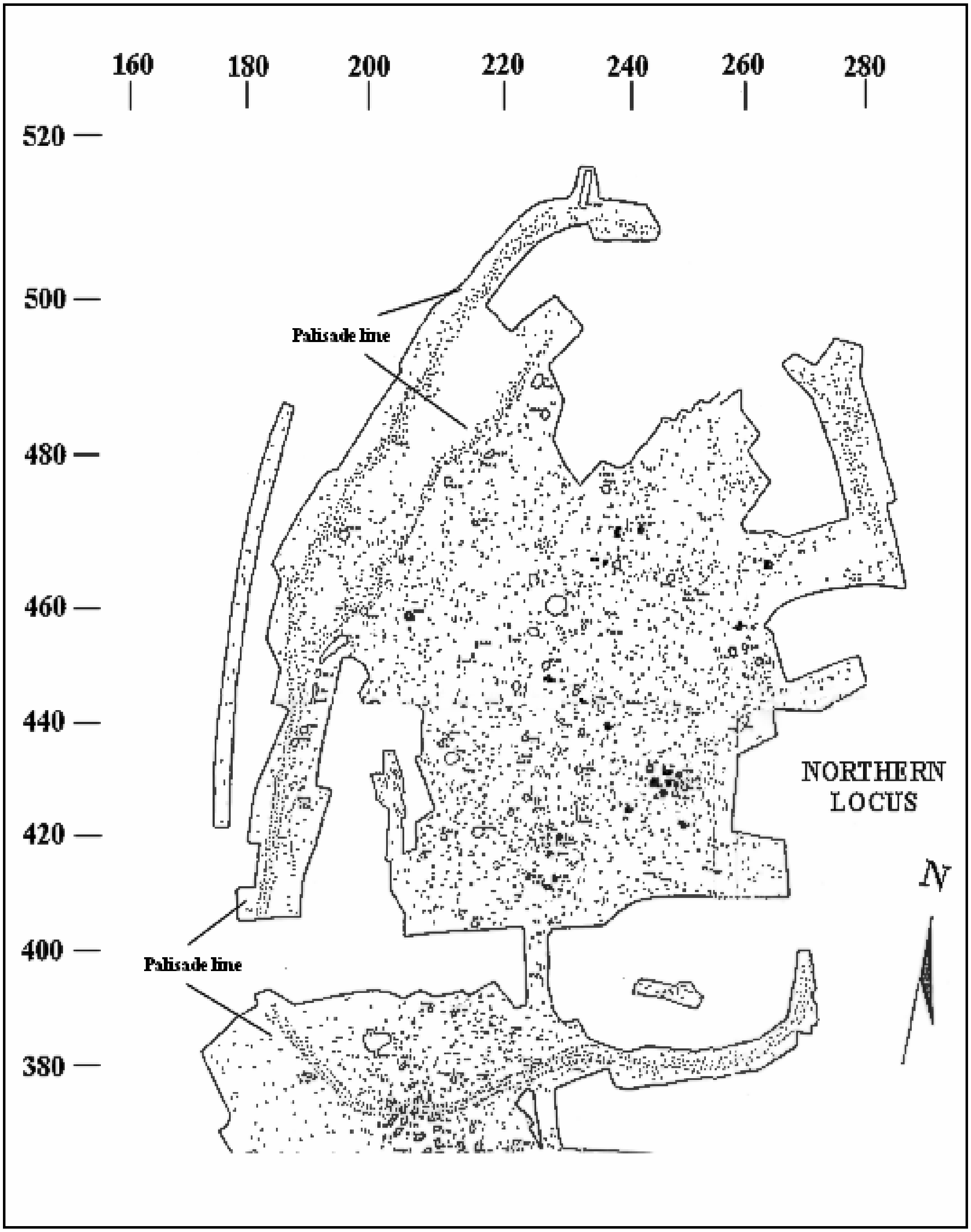

Figure 3.7 Palisade and features in the northern locus at Hickory Log (9CK9).

The palisade line appears to split into two main lines along the northwestern side of the enclosed area. Three rows of posts are notable in the outer line, while only one to two rows comprise the inner line (Webb 2001). A single cultural feature occurs between the main lines and posts are absent in much of this area. A similar split of the palisade line is suggested by the post patterns in the northern extent of the excavated eastern portion of the site; determination of the point where these palisade lines joined the lines above was hampered by the presence of large quantities of rock in the subsoil (Webb 2001). Webb (2001) speculates that the inner line may represent an entrance feature associated with the gap in the outer line around N510 E230, if the single-rowed inner line is the same age as the three-rowed outer line surrounding the enclosure.

Numerous Woodstock postholes were encountered inside the palisade. Of 52 non-palisade posts in the northern locus, 54% contained Woodstock Complicated Stamped ceramics, 27% contained unidentified complicated stamped ceramics, 11% contained Swift Creek ceramics, and 7% contained Late Woodland incised or plain ceramics (Webb 2001). Although no recognizable Woodstock structures have been identified to date, partial arcs of posts suggest that Woodstock structures at Hickory Log were most likely constructed of single-set posts and were oval in form (Webb 2001). Evidence for rectangular patterns or wall trenches is absent.

3.3b 9GW70 (Rivermoore)

Rivermoore is a large Woodstock occupation located near the summit of an east-west oriented ridge on the north bank of the Chattahoochee River in Gwinnett County. Salvage excavations were conducted by R. S. Webb and Associates in 1997 prior to the construction of a subdivision. A series of exploratory trenches excavated across the northern portion of the site revealed subsurface features and high concentrations of

Woodstock ceramics. Broad-scale stripping of these areas exposed distinct post-hole patterns (indicating structures) and numerous pit features. Three domestic areas were identified by the presence of structures and are designated as domestic areas DA-1, DA-2, and DA-3. Ceramic analysis indicates Rivermoore was occupied predominantly during the Woodstock phase (Table 3.7).

Table 3.7 Description of Woodstock features at 9GW70 (Rivermoore).

Domestic Area	Provenience	Description	Ceramic Inventory	Count
DA-3	E Trench N side*	Structure 1 East wall trench	Woodstock Complicated Stamped Woodstock Cordmarked Woodstock Plain Etowah Complicated Stamped	322 2 28 3
	E Trench S side*	Structure 1 East wall trench	Woodstock Complicated Stamped Woodstock Plain	50 9
	North Trench*	Structure 1 North wall trench	Woodstock Complicated Stamped Woodstock Cordmarked Woodstock Plain	137 2 14
	South Trench*	Structure 1 South wall trench	Woodstock Complicated Stamped Woodstock Plain	392 22
	West Trench*	Structure 1 West wall trench	Woodstock Complicated Stamped Woodstock Cordmarked Woodstock Plain Etowah Complicated Stamped	227 5 8 10
	Feature 9	Pit	Woodstock Complicated Stamped Woodstock Plain	4 1
	Feature 12*	Pit	Woodstock Complicated Stamped Woodstock Plain	48 1
	Feature 47 E Half	Pit	Woodstock Complicated Stamped Woodstock Plain	5 1
	Feature 52*	Pit	Woodstock Complicated Stamped	15
DA-1	Feature 181*	Pit	Woodstock Complicated Stamped Woodstock Cordmarked	9 1
	Feature 205*	Pit	Woodstock Complicated Stamped	5

* Proveniences from which macrobotanical maize remains were recovered.

Early Etowah Complicated Stamped ceramics were present in a small number of contexts and constitute a minor portion (.01%) of the ceramics recovered from domestic areas one (DA-1) and three (DA-3). Domestic area two (DA-2) has only an early Swift Creek component.

The structures located in DA-1 in the southern portion of the site were constructed using single set posts and are square in shape (Figure 3.8). The remains of a hearth and pit features were present in each structure.

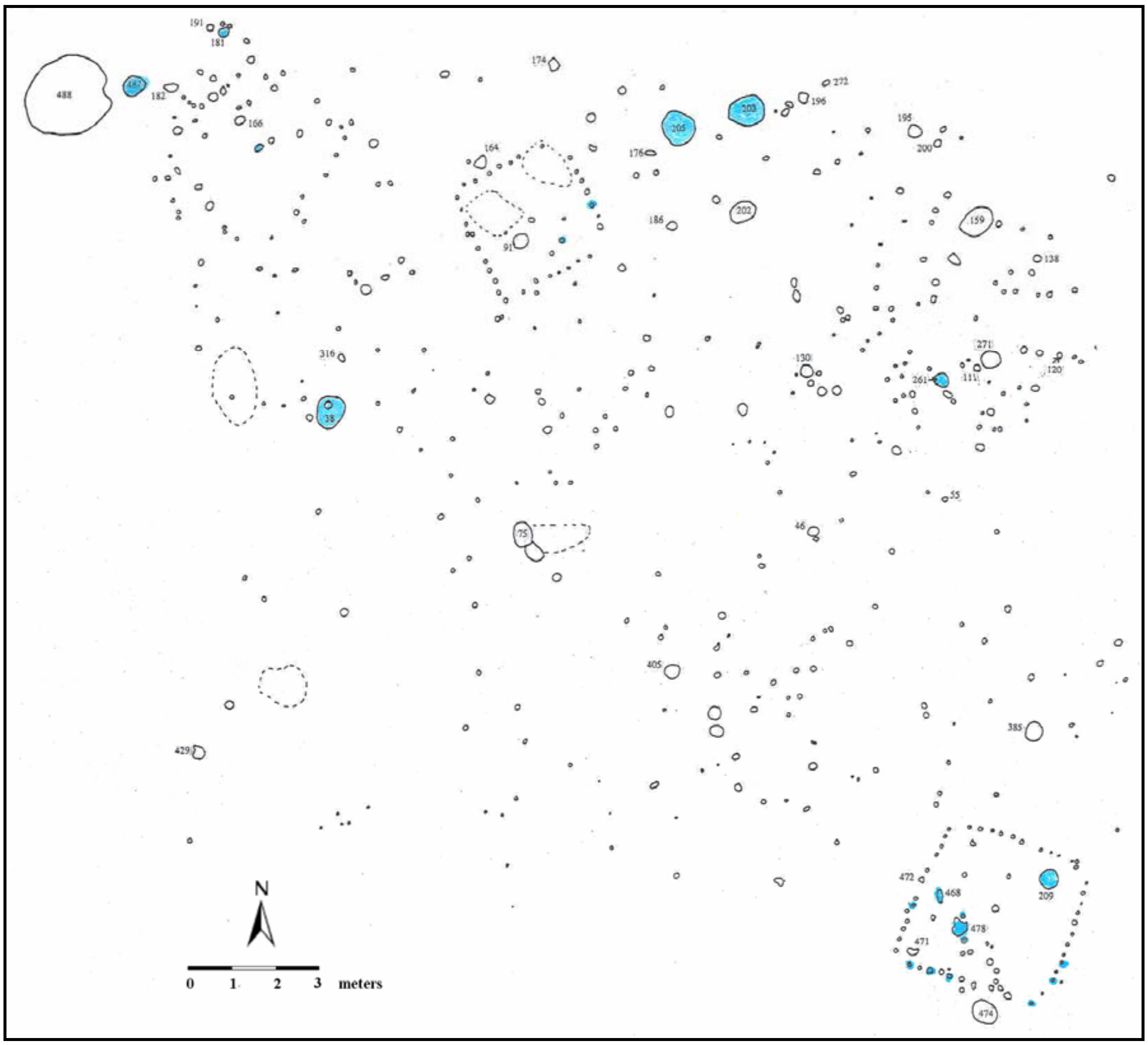

Figure 3.8 Domestic Area One (DA-1) at Rivermoore (GW70). Gray-filled features indicate the presence of macrobotanical maize remains

Because the structure located in the southeast portion of DA-1 was well-defined, approximately half (n=24) of the outer wall post holes were analyzed for botanical remains. Several pit features both inside and immediately outside the walls of the two northern structures were also excavated and analyzed for botanical remains (see Chapter 5 for a discussion of the botanical analysis).

The largest structure (Structure 1) in DA-3 is located on a slight rise relative to other structures in the northern portion of the site and is rather circular in shape (Figure 3.9).

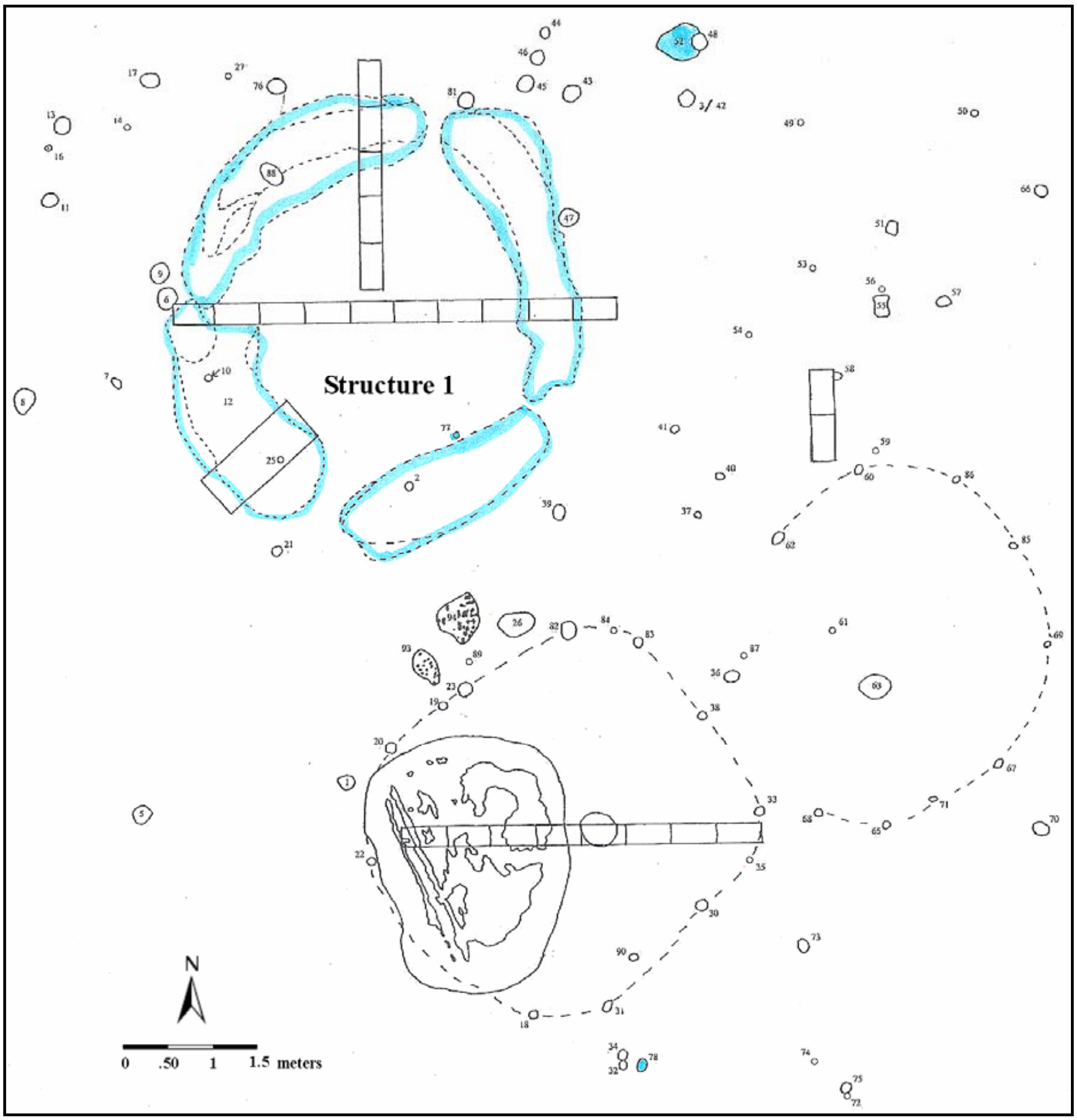

Figure 3.9 Domestic Area Three (DA-3) at Rivermoore (GW70). Gray highlighted or filled features indicate the presence of macrobotanical maize remains.

In contrast to the square, single set post structures in DA-1, Structure 1 is represented by a series of four large trenches (Figure 3.9) that are separated by small gaps oriented approximately with the cardinal directions. Although no post holes were located within the trenches, Steve Webb (personal communication 2002) argues their configuration suggests that they served as wall trenches. These trenches and several associated pit features (Table 3.7) were excavated and submitted for botanical analysis. No hearth was located. Due to its larger size (25 m^2), particularly in contrast to the structures in DA-1 that average 8.6 m^2, and circular rather than square shape, Webb (personal communication) suggests that Structure 1 may have served as a community house.

3.3c 9TO48

This large, palisaded site is located in the Brasstown Valley, which is drained by Brasstown Creek, a tributary of the Hiawassee River in the Tennessee River drainage. Survey and testing of this area was conducted by West Georgia College in 1987 and 1988 and by New South Associates in 1992 to identify archaeological sites that would be impacted by development of the Brasstown Valley Resort and golf course (Joseph 2000). Placing shovel tests at 20-m intervals, New South Associates excavated 680 tests within the larger project area; 342 tests yielded cultural material (Cable and Gard 2000).

Artifact density distributions revealed 15 areas of high artifact density, which were labeled as loci A through O (Figure 3.10) (Cable and Gard 2000). Excavation of 26 1-x-1-m test units in selected loci across the project area indicated a long occupation history extending from the Early Archaic period through Cherokee occupation and a clear vertical stratification of Mississippian debris over Early and Middle Woodland material (Cable and Gard 2000).

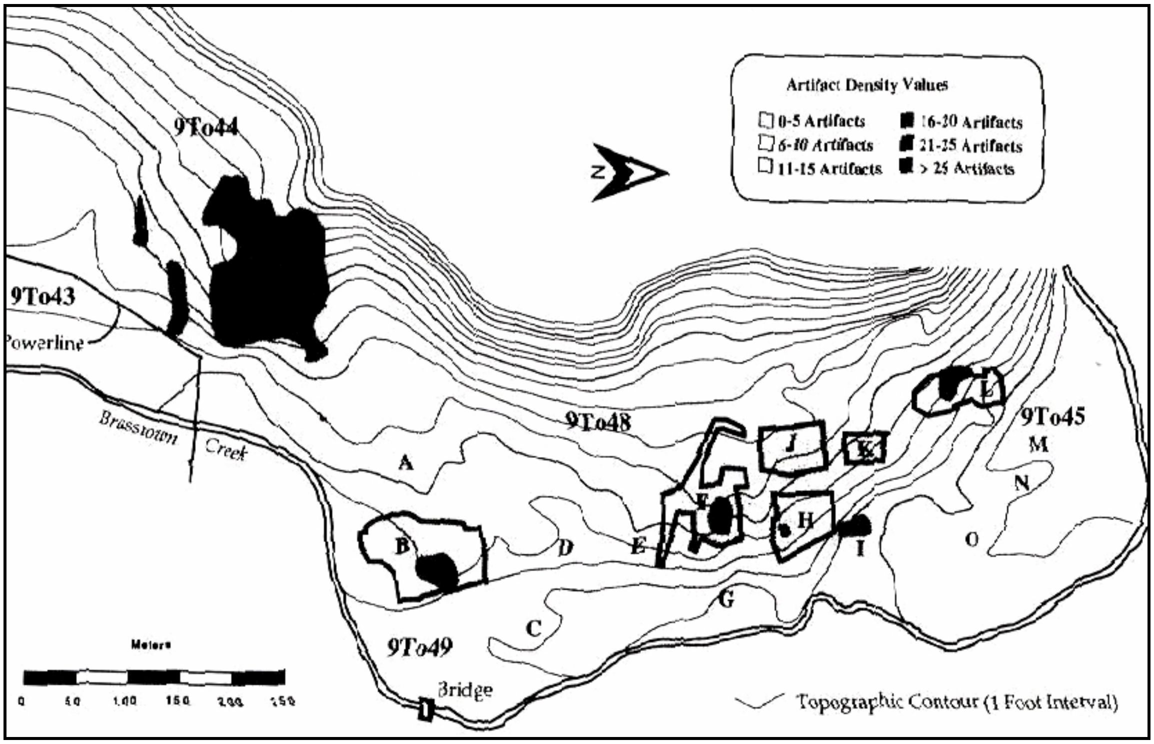

Figure 3.10 Location of areas stripped at 9TO48 (Cable and Gard 2000:Figure 5).

In 1993 a four-stage excavation strategy was employed to determine culture chronology, settlement plan, and subsistence in the project area. The first stage was designed to "generate a representative artifact sample, and provide a basis for selecting areas for broad-scale machine stripping" and consisted of the excavation of 227 1-x-1-m test units across all 15 loci (Cable and Gard 2000:9). The second stage involved the excavation of backhoe trenches along the flood plain and terraces to expose vertical stratification (Cable and Gard 2000). This information was used to select locations for three stratigraphic block excavations in the third stage. Block 1 was a 1-x-2-m unit located in 9TO48 to the south and east of Locus H. Block 2 (2-x-2-m) and Block 3 (4-x-8-m) were located in 9TO49 at the western end of Locus B (Cable and Gard 2000). Motif analysis indicated that Locus B was predominantly a Late Etowah occupation.

The final stage involved extensive excavation through the use of broad-scale machine stripping to expose an area of approximately 24,000 m^2 or nearly five acres (Cable and Gard 2000). Four large loci (Loci F, H/I, J, and K) were stripped at 9TO48 (Cable and Gard 2000). Although excavations were extensive, the ceramic assemblage recovered from Locus F and Locus H/I contexts was small. A catch-all *Late Woodland* category grouped motifs that could not be assigned to a specific ceramic series. In Loci F and H/I, this category was comprised of Swift Creek, Woodstock, or Early Etowah materials (Cable 2000:108). Only two definite Woodstock Complicated sherds were recovered from these loci; dating of features was based primarily on the more general *Late Woodland* category. Thus, assignment of the occupation at 9TO48 to the Woodstock phase is provisional.

Excavation of Locus F revealed a partially preserved but incomplete single palisade line, approximately 150 m in length (Figure 3.11) that shows possible intermittent repair. Extensive sampling of the postholes yielded a higher proportion of Late Woodland and Woodstock ceramics (27%) than Etowah ceramics (15%) (Cable 2000) (Table 3.8). When the Cartersville ceramics are excluded, the Late Woodland and Woodstock ceramic types comprise 60% of the sample, while Etowah ceramic types comprise only 33%. Three pit features (Features 1519, 1520, and 1532) were excavated and produced a smaller proportion (8%) of Etowah phase sherds. Cable and Gard (2000:19) argue that this ceramic evidence suggests that the settlement was "short-lived and abandoned prior to the accumulation of a great deal of Etowah occupation debris."

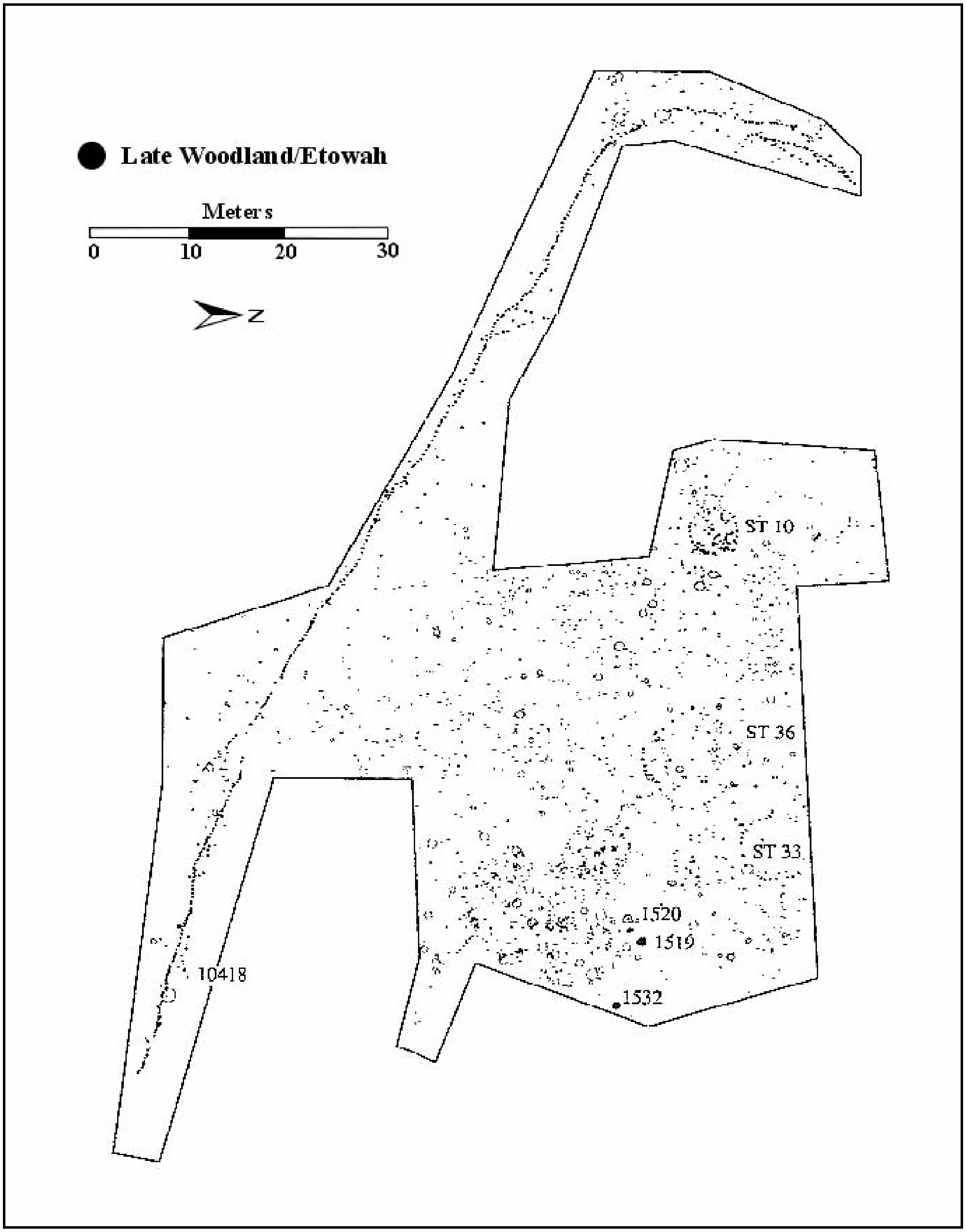

Figure 3.11 Palisade and features in Locus F (adapted from Cable 2000:Figure 42).

Table 3.8 Ceramic type frequencies from features at 9TO48.

Ceramic Type	Palisade	Feature 1519	Feature 1520	Feature 1532
Cartersville	6	6		20
Swift Creek	1			1
Woodstock	1			
Late Woodland	8	1	2	4
Etowah	6	1		2

Eleven structures (Table 3.9) associated with the palisade were located: nine structures in Locus F and two structures in Locus H/I. Eight structures represented by a single row of unevenly spaced posts are ovoid in shape. One side appears to be partially open in at least three structures (Structures 8, 37, 38). Three additional structures (Structures 9, 11, 33) may exhibit the same construction, but their locations near stripping block edges do not allow for a clear determination of the posthole pattern. No structures show evidence of interior hearths.

Table 3.9 Summary of structures at 9TO48 (adapted from Cable 2000:158).

Structure	Structure Type	Floor Area (m^2)
2	*Ovoid Domestic Structure*	25.53
3	*Circular Domestic Structure*	21.80
8	*Ovoid Domestic Structure*	38.63
9	*Ovoid Domestic Structure*	37.15
10	*Circular Domestic Structure*	17.64
11	*Ovoid Domestic Structure*	39.29
33	*Ovoid Domestic Structure*	48.89
36	*Sub-square Community House?*	104.55
37	*Ovoid Domestic Structure*	42.95
38	*Ovoid Domestic Structure*	39.37
39	*Ovoid Domestic Structure*	27.72

Structure 36 (see Figure 3.11), located in the approximate center of the palisaded area, exhibits a single-set post, sub-square shape and a large floor area (104.55 m^2). Structure 36 may represent a community building. The two structures (Structures 2 and 3) located approximately 50 m to the north in Locus H/I (Figure 3.12) are tentatively identified as belonging to the settlement, but such a determination is difficult as the area between the two loci was left unexposed by stripping operations (Cable 2000).

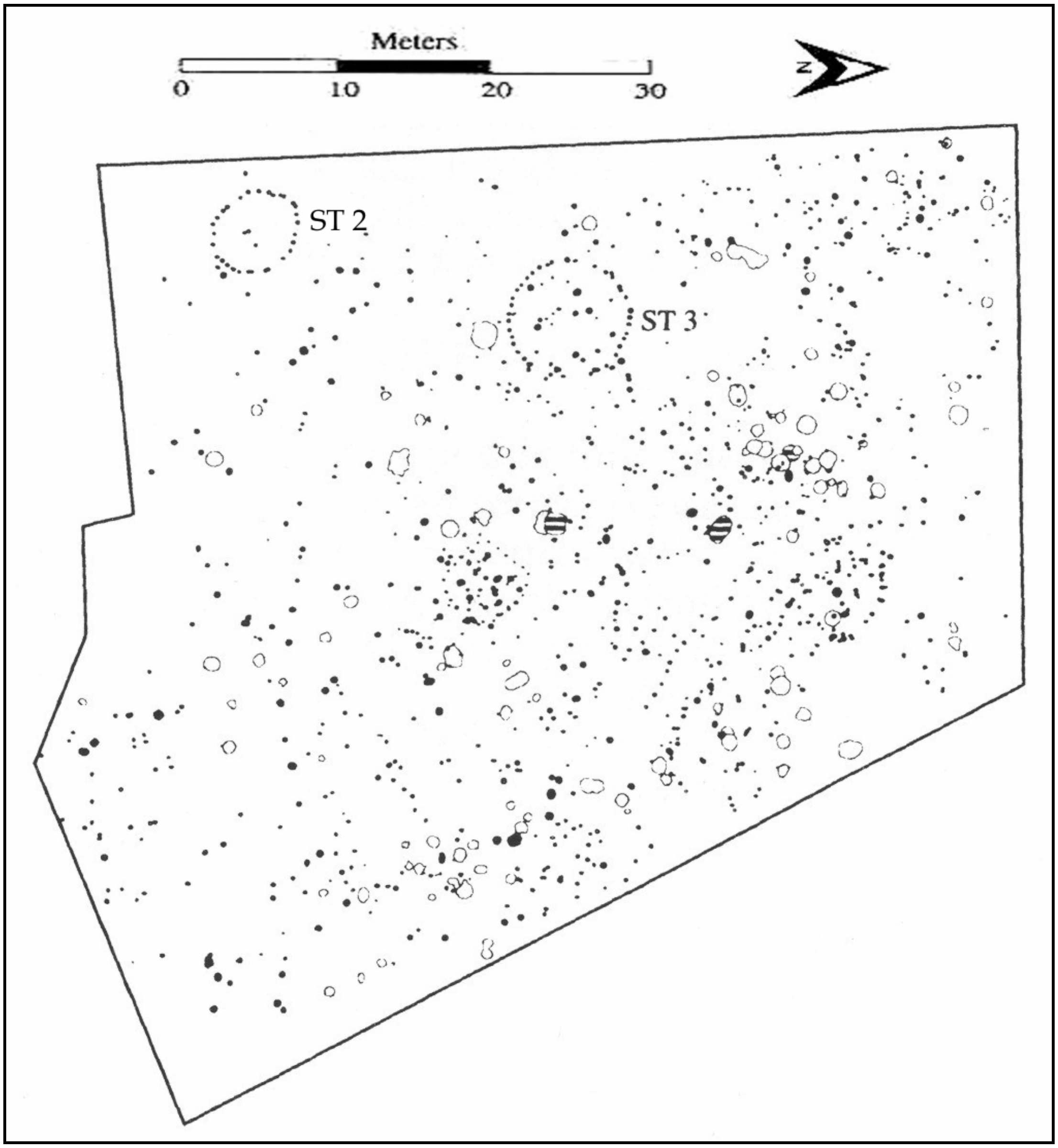

Figure 3.12 Structures 2 and 3 in Locus H/I (adapted from Cable 2000:Figure 43).

To address subsistence practices and changes in subsistence over time, 199 "2-10 liter soil samples from excavated features (dish- and bell-shaped pits, pit ovens, and post holes) were processed in a tank flotation system" that utilized 0.8 mm stainless steel mesh on the bottom of the float box and 0.4mm mesh on the sides (Raymer and Bonhage-Freund 2000:74). Early to Middle Woodland (A.D. 0 to A.D. 600) subsistence reconstruction was based on the archaeobotanical analysis of a total of 134 liters of flotation samples collected from 14 features (Raymer and Bonhage-Freund 2000). Late Woodland (A.D. 600 to A.D. 900) subsistence practices were determined through the analysis of 65 liters of flotation samples collected from seven Late Woodland features. Etowah phase (A.D. 900 to A.D. 1200) subsistence was reconstructed through analysis of 130 liters of flotation samples from 13 features.

3.4 Smaller Settlements

3.4a 9MU103 (Potts' Tract)

Potts' Tract (9MU103) (Figure 3.13) was first surveyed in 1967, which led to testing and salvage excavations by the University of Georgia in 1968 before the site was flooded by the construction of a reregulation dam located below Carter's Dam in Murray County, GA (see Figure 1.2). The 1968 excavations were limited to a three acre tract of land leased from the tenant farmer, and the site was buried beneath one to two feet of alluvium (Hally 1970). Consequently, the true spatial limits of the site are unknown.

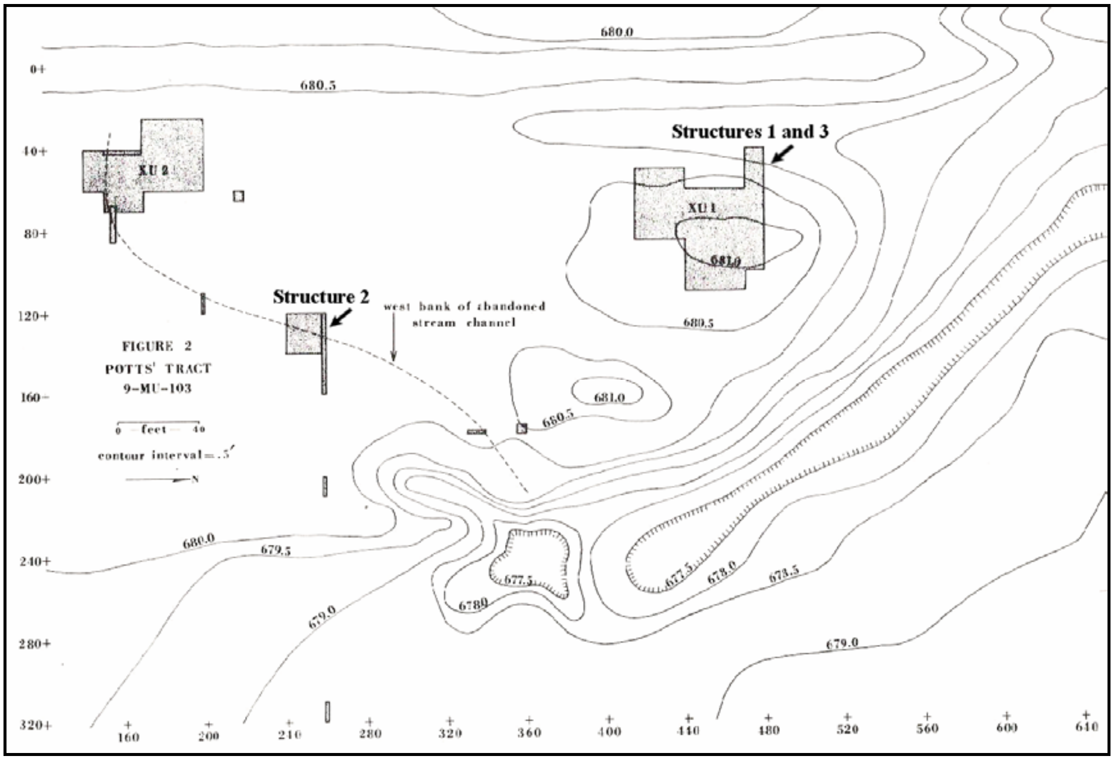

Figure 3.13 Excavation units at Potts' Tract (9MU103) (from Hally 1970:Figure 2).

The first phase of investigation involved the excavation of three 1.52-x-1.52-m (5-x-5 ft) test pits located in the southwest, east-central, and northwest portions of the site. While two of the pits yielded few artifacts and no occupation features, the third test pit encountered "superimposed Woodstock and Barnett phase (A.D. 1550 to A.D. 1600) occupation zones and associated architectural features" (Hally 1970:2). This test pit was expanded into an east-west trench with a width of 3.05 m (10 ft) and a final length of 19.81 m (65 ft) and was designated as Excavation Unit 1 (XU1) (see Figure 3.13) (Hally 1970). Two Barnett phase structures (Structures 1 and 3) were encountered in XU1 and completely excavated. Trenches placed in the vicinity of a fossil stream channel near the south end of the site located another Barnett phase structure (Structure 2) which was also fully excavated (Figure 3.14) (Hally 1970).

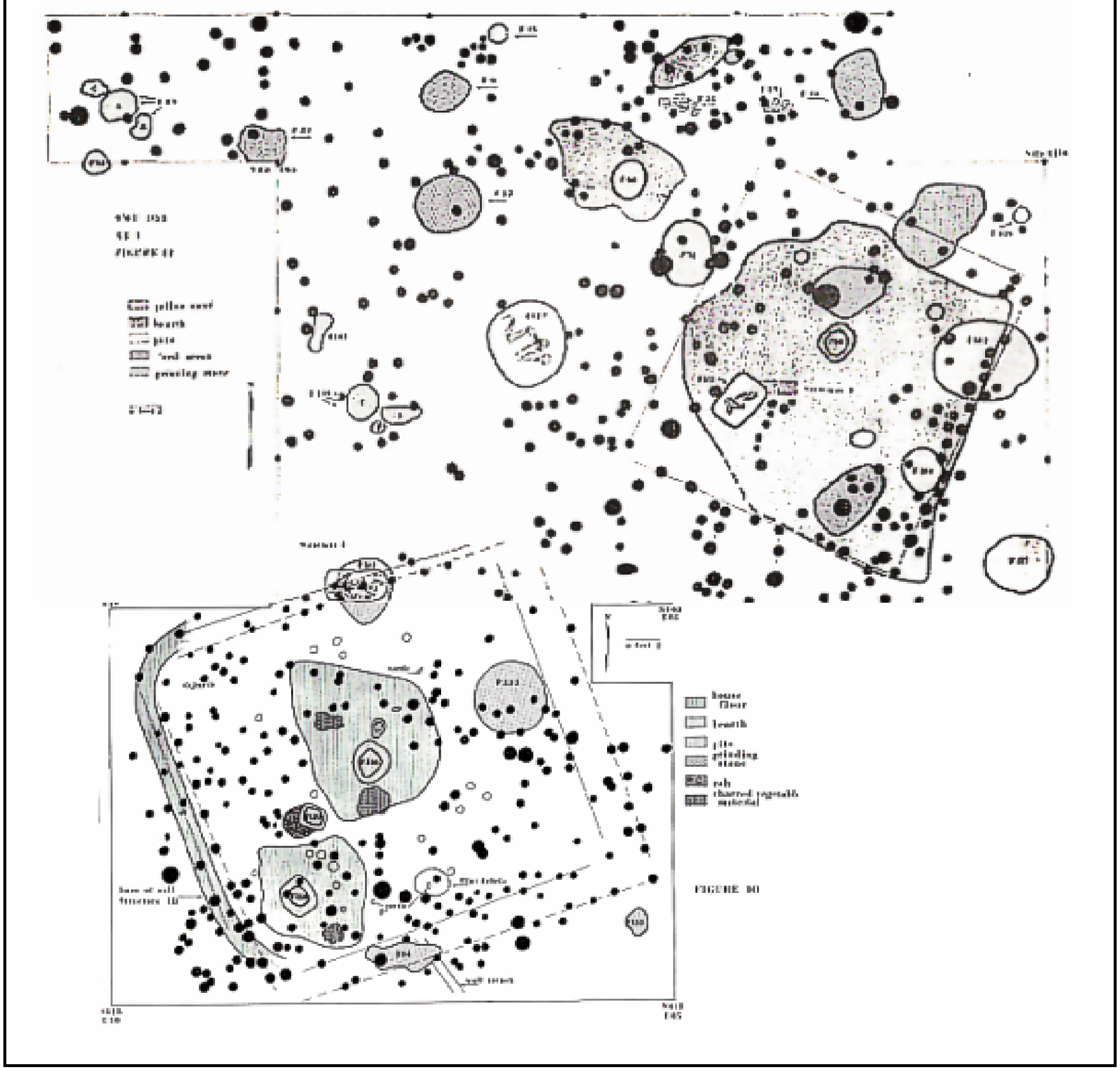

Figure 3.14 Location of features in XU1 (adapted from Hally 1970:Figures 10 and 13).

Although a Woodstock phase midden was encountered in XU1, the lack of an intervening sterile layer between it and the Barnett phase midden made the assignment of some postholes and other features to a particular occupation difficult (Hally 1970). Nine Woodstock features were excavated, all within XU1. A portion of each feature was subjected to flotation (Table 3.10); samples sent to the University of North Carolina, Chapel Hill for archaeobotanical analysis in 2004 are noted in Table 3.9. While Woodstock artifacts were scattered across the entire three acre area, Woodstock features appeared only in the northern portion of the site. The occurrence of a distinct Woodstock midden with habitation features (pits, postholes) in XU1 but absent in XU2 further supports the assertion that the Woodstock occupation was concentrated in the northern portion of the site.

Table 3.10 Description of Woodstock features at Potts' Tract (9MU103).

Feature	Location	Description	Ceramic Inventory	Count
15	XU1	Posthole or animal burrow	Woodstock Complicated Stamped Woodstock Plain	1 1
33	XU1	Charcoal concentration	Woodstock Complicated Stamped	1
83[*#]	XU1	Pit	Woodstock Complicated Stamped Woodstock Plain	62 10
89A-C	XU1	Pits; 89B-C may be large postholes	Woodstock Complicated Stamped Woodstock Plain Woodstock Unidentified	61 3 6
122[*#]	XU1	Pit	Woodstock Complicated Stamped Etowah Complicated Stamped Woodstock Plain Woodstock Unidentified Lamar Plain (intrusive posthole) Dallas Plain (intrusive posthole)	74 1 5 8 1 4
133[*#]	XU1	Large pit	Woodstock Complicated Stamped Etowah Complicated Stamped Woodstock Incised Woodstock Plain Woodstock Unidentified Lamar Plain (intrusive posthole)	195 3 1 3 24 2
135	XU1	Small rounded depression	Etowah Complicated Stamped Dallas Filleted	19 1
137	XU1	Pear-shaped pit	Woodstock Complicated Stamped	1
143	XU1	Pit	Woodstock Complicated Stamped Etowah Complicated Stamped Woodstock Plain	20 1 2
Woodstock Midden[*]	N450 E70	3-x-3-m unit (10-x-10 ft); 95.5 bd	Woodstock Complicated Stamped Woodstock Check Stamped Etowah Complicated Stamped	9 2 1

[*] Features from which flotation samples were analyzed for subsistence reconstruction.
[#] Features from which ^{14}C samples were taken.

3.4b 9GO4 (Thompson)

I conducted excavation and survey of the Thompson site during June and July of 2002 and 2003 with students from the University of Georgia's Archaeological Field School. Previous excavations by the Coosawattee Foundation, a non-profit group of amateur archaeologists and volunteers in the north Georgia area, indicated that the Thompson site (9GO4), located on the Coosawattee River in Gordon County, (see Figure 1.2) might have been a palisaded Woodstock village/town. Ceramic analysis indicates that the site was not occupied during the Swift Creek or Napier phases.

The site, covering 2.5 to 3 hectares, is bordered to the north by the Coosawattee River, to the east by a small creek that drains into the Coosawattee and to the west by a natural slough. To shed light on the nature of the occupation, whether compact and palisaded or dispersed and undefended, shovel tests (n=136) were placed at 10 m intervals across the site to determine its boundaries. Shovel test data indicate that the Woodstock occupation is lightly scattered across the site but does not reveal any useful density patterns. Additionally, a Late Mississippian Lamar component completely overlies the Woodstock occupation.

Although a large site, no definitive Woodstock features have been located. Potential Woodstock postholes have produced only a handful of artifacts, none of which were diagnostic (i.e. bone and lithic flakes). Unfortunately, these posts were intermingled with numerous Lamar posts and pit features and thus are hard to confidently separate from the Lamar occupation, even though no Lamar ceramics were found in any of the posts.

Shovel testing enabled the determination of the site's northern limit, which is the most likely location for evidence of a palisade. Two trenches (50 cm wide) were excavated in a north to south direction along the 560N line. The first trench at 610E produced very few artifacts and no features. The second trench, located 10 m to the west of the first trench at 620E, produced numerous Woodstock, Lamar and Dallas ceramics and stratified deposits of charcoal and fired daub that represent a Barnett phase house.

Local history suggests that a mound once existed at the site but was pushed into an old river channel in the 1960s to allow farming access to an island in the river. Local history places this "bridge" roughly along the 500N line, running southwesterly into the old river channel. To test this assumption, we placed two 1 m wide trenches along the 501N line, running east to west. The most western trench failed to yield a single artifact and produced only sterile yellow clay, which was determined to be deposited by floodwaters.

The eastern trench has been taken to a depth of approximately 1 m and has yet to yield any artifactual or stratigraphic evidence for the relocation of the prehistoric mound on this slope. Survey of the forested area to the north of these trenches, however, suggests that some earth moving activity may have occurred here at some point in the recent past. It is my opinion that this portion of the site appears to be the most likely candidate for evidence of a "relocated" mound. However, the high density of Late Mississippian artifacts suggest that even if a mound did exist at one time, it was not constructed by Woodstock peoples.

The relatively low frequency of Woodstock ceramics, combined with the scattered nature of their occurrence and the overlay of a denser Lamar occupation suggests that the Thompson site was not a large, densely occupied, palisaded Woodstock village. However, investigation of Thompson proved useful as its proximity to Potts' Tract and the similarity of ceramic assemblages were integral in refining the Woodstock chronology into Early and Late Woodstock subdivisions. The presence of a few Early Etowah ladder-base diamond sherds in predominately Woodstock collections at both Potts' Tract and Thompson was critical in determining the Late Woodstock ceramic repertoire.

CHAPTER 4

REDEFINING WOODSTOCK CHRONOLOGY

The locations and spacing of contemporaneous sites during the Woodstock phase may indicate settlement clustering, which may indicate political centralization. As mound distribution data during the Mississippian period indicate that polities had approximately 100 year life spans and that such areas were abandoned upon polity collapse (Hally 1993), I reanalyzed ceramic collections from Woodstock phase sites to establish a ceramic chronology that would divide the 200 year Woodstock phase into at least Early and Late divisions. I then used this chronology to determine contemporary sites and to search for site clustering (see Chapter 8: Defining Woodstock Clustering for a detailed discussion).

4.1 Ceramic Type Descriptions

As Woodstock Complicated Stamped motifs fall stylistically between Swift Creek/Napier and Etowah Complicated Stamped motifs, the Woodstock phase is chronologically placed between the Late Woodland Napier and Swift Creek phases and the Mississippian Etowah phase in northern Georgia. Therefore, Woodstock Complicated Stamped ceramics differentiate Woodstock sites from sites of earlier and later phases.

4.1a Napier Complicated Stamped

Figure 4.1 Napier Complicated Stamped.

Napier Complicated Stamped was named by Jennings and Fairbanks for the Napier type site (9BI9) east of Macon, Georgia (1940). Designs were stamped onto fine to medium sand or sand and grit tempered pottery, are predominantly rectilinear, and include zigzagging multiline strands that form diamonds across a background of parallel lines, herringbone lines, and multiline strands that pass back and forth across each other and are filled with parallel lines, curvilinear hourglasses (or snowshoes) with parallel lines filling the hourglasses themselves as well as the surrounding fields (Figure 4.1 and Figure 4.2) (Wauchope 1966).

Stamped lines were finer and more closely spaced compared to the earlier Swift Creek and later Woodstock stamping traditions. Vessel forms include a deep beaker with straight vertical or slightly flaring sides, globular jars and bowls with incurving lips, shouldered jars, and bowls with widely flaring rounded sides.

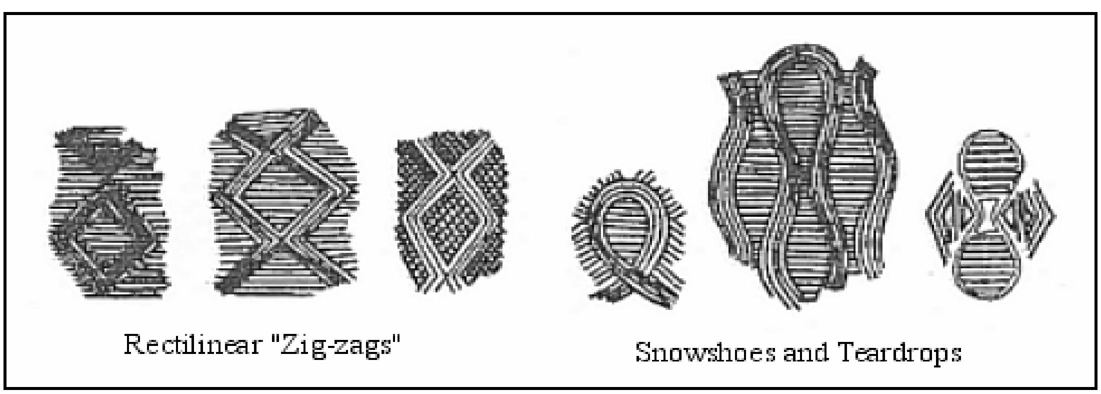

Figure 4.2 Napier Complicated Stamped designs (from Wauchope 1966:Figure 15).

4.1b Swift Creek Complicated Stamped

Swift Creek Complicated Stamped is named after the Swift Creek type site (9BI3) near Macon, Georgia (Kelly 1938). Designs were stamped onto fine and coarse sand tempered pottery, are predominantly curvilinear and include concentric circles, concentric spirals, and hatched teardrops or snowshoes (Williams and Thompson 1999) (Figure 4.3 and Figure 4.4).

Figure 4.3 Swift Creek B-Complex.

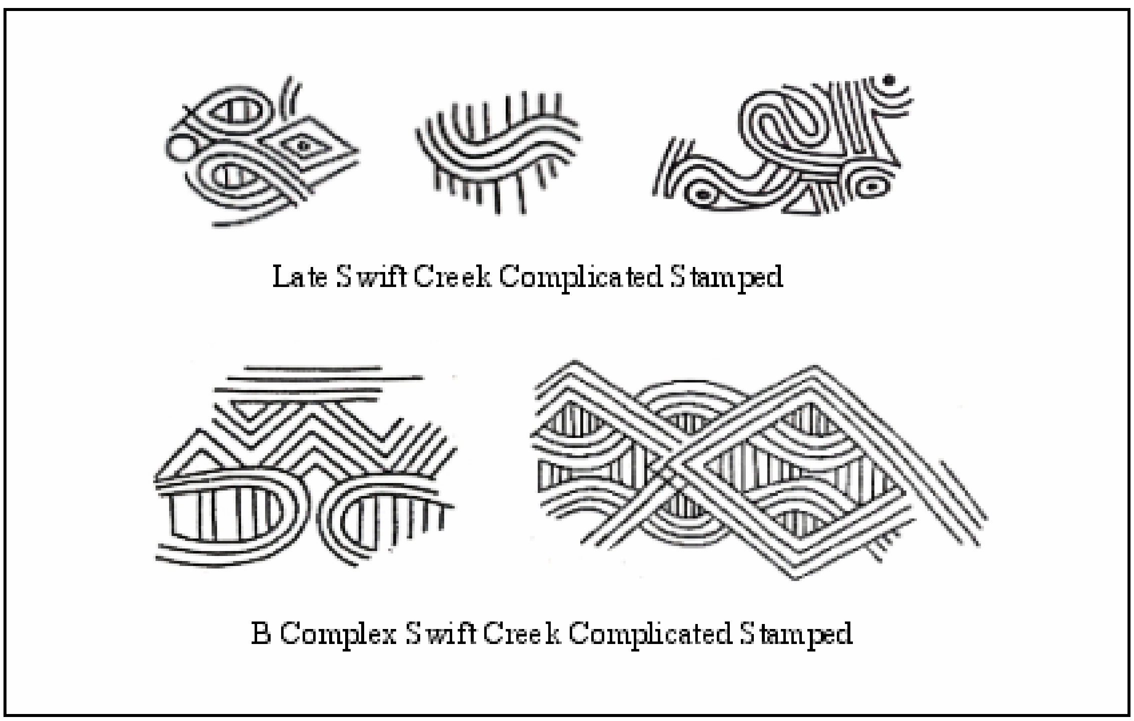

Figure 4.4 Late Swift Creek Complicated Stamped designs (from Rudolph 1991:Figure 2 and Figure 4).

According to Broyles (1967) and Wauchope (1966), the Late Woodland vessel assemblage is dominated by a jar with a short neck, slight shoulder, and a generally rounded to conical base; simple flat- and round-bottomed bowls are also present in limited amounts. Rims are folded, which is the defining difference between early and late Swift Creek designs. This assertion is based on very few whole or reconstructed vessels.

4.1c Woodstock Complicated Stamped

Woodstock Complicated Stamped is named after the type site (9CK2) located in Woodstock, Georgia (Wauchope 1948). Designs were stamped onto sand/grit tempered pottery and include concentric diamonds (Figure 4.5), concentric ovals (sometimes referred to as snowshoes), and line block and herringbone designs (Figure 4.6). The temper frequently involves the inclusion of mica particles (Caldwell 1971). Wauchope characterized the Woodstock vessel assemblage as being similar to the general Late Woodland vessel assemblage of jars with a short neck, slight shoulder, and a generally rounded to conical base and simple bowls, although this assumption was not based on a formal study of Woodstock vessel forms (1966:60). Although jars had flaring rims, lips were typically

Figure 4.5 Concentric Diamond motif.

rounded and flat (Wauchope 1966). Exterior surface colors range from shades of brown to red or dark gray (Wauchope 1966; Caldwell 1971).

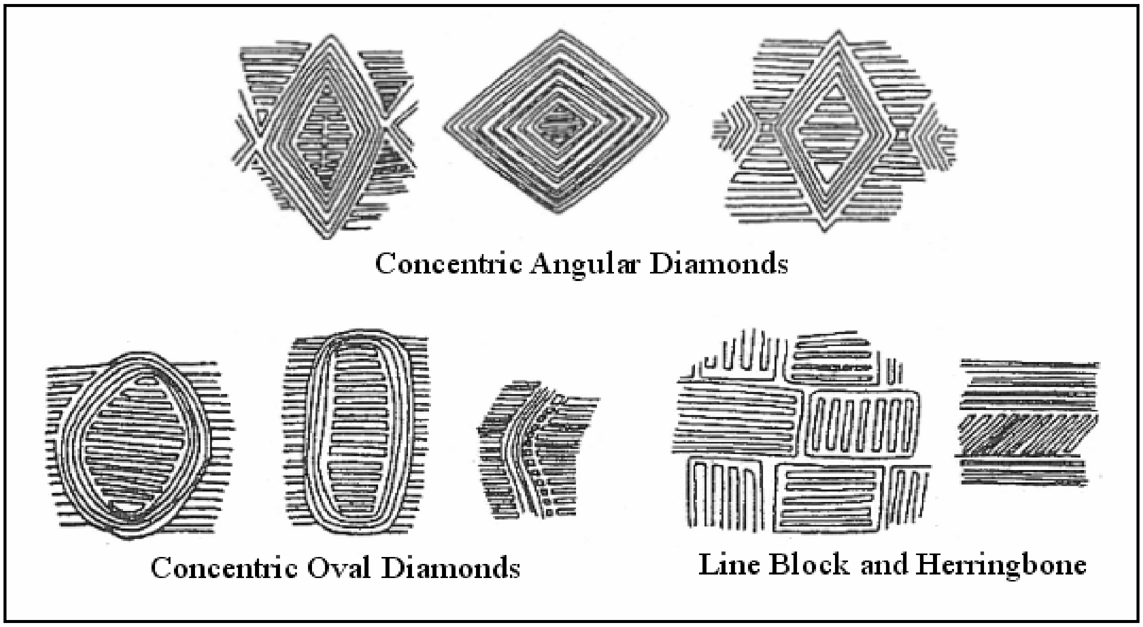

Figure 4.6 Woodstock Complicated Stamped designs (from Wauchope 1966:Figure 18).

Concentric angular and oval diamonds are framed by multiple-line borders ranging from as many as five lands (raised lines) and four grooves (depressed lines) to as few as two lands and one groove. Both oval and angular diamonds are arranged in chain-like patterns across a background of parallel lines that form right angles to the chains of diamonds (Wauchope 1966:60-62). Line block designs (Figure

Figure 4.7 Woodstock Line Block motif.

4.7) were boldly executed with relatively wide and widely spaced lines; line block units were square to rectangular but were not always executed in a perfect ratio to each other (e.g. a shorter block was often placed over a long block). The herringbone design is characterized by alternating horizontal and diagonal lines and parallels a Napier Stamped pattern as well as a Woodstock Incised motif (Wauchope 1966).

4.1d Woodstock Check Stamped

In his Allatoona report (1957), Caldwell credits Wauchope for naming Woodstock Check Stamped after the type site (9CK2) located in Woodstock, Georgia, although the type is not described by Wauchope in his *Archaeological Survey of Northern Georgia* (Williams and Thompson 1999). The motif involved the stamping of square or rectangular checks over the entire vessel surface with individual check sizes often varying over a single vessel due to the use of "carelessly carved" paddles (Caldwell 1971:135). Temper, surface finish, and vessel forms are identical to Woodstock Complicated Stamped.

4.1e Woodstock Incised

Woodstock Incised is named after the type site (9CK2) located in Woodstock, Georgia. Decorations involved incising on sand/grit tempered pottery and extended downward from the lip; frequently the upper three centimeters of the wall was undecorated (Wauchope 1966). Incised designs consisted of horizontal lines or alternating bands of horizontal and diagonal lines that were often interspersed with rows of jabbed punctuations (Wauchope 1966; Williams and Thompson 1999) (Figure 4.8). Incised lines were wide and shallow, and punctuations ranged from "small pinpoint holes to large gouges, circular, square, or rectangular in outline" (Wauchope 1966:63). Surface colors range from tan to dark gray, and interior and exterior surfaces of a single vessel are often different colors. According to Wauchope (1966), the predominant vessel shape is the tall vase or beaker, which is cylindrical in shape with vertical, slightly outcurving or insloping rims; less frequent forms include jars and bowls.

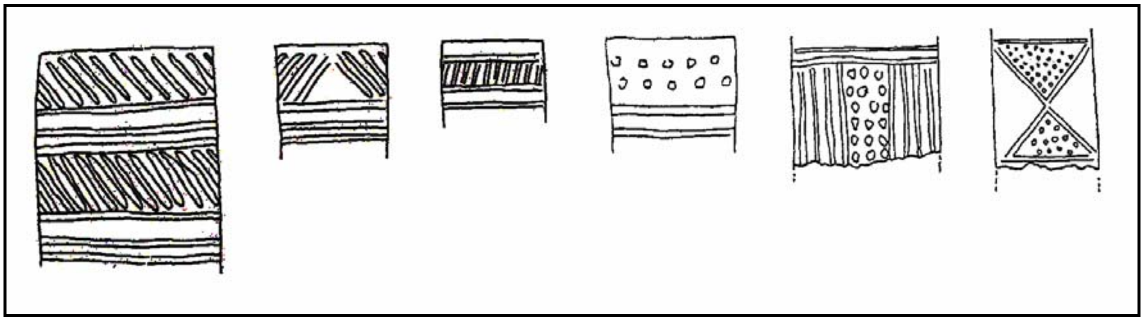

Figure 4.8 Woodstock Incised (from Wauchope 1966:Figure 21).

4.1f Woodstock Plain

Although Woodstock Plain was identified by Wauchope in his Woodstock series named for the type site (9CK2) located in Woodstock, Georgia, the type is not described by Wauchope in his *Archaeological Survey of Northern Georgia*. According to Caldwell's Allatoona Report, Woodstock Plain is characterized by sand/grit tempered pottery that frequently involves the inclusion of mica particles (1957). The exterior and interior surfaces were smoothed with care but only rarely were burnished. According to Caldwell (1957), the most common vessel form is the wide-mouthed jar but bowls, although infrequent, are present.

4.1g Early Etowah Complicated Stamped

Etowah Complicated Stamped was named after the Etowah type site (9BR1) located in Cartersville, Georgia. Designs were stamped onto sand/grit tempered pottery and are dominated by the ladder-base diamond and line block motifs (King 2001) (Figure 4.9). The ladder-base diamond is formed from the addition of two horizontal bisecting lines to the concentric diamond motif, forming a "ladder-like element" (Wauchope 1966:67). Temper also often involves the inclusion of mica particles and exterior surface colors range from shades of brown to red or dark gray (Wauchope 1966). Although Early Mississippian vessel forms in northern Georgia have never been characterized, the Etowah vessel assemblage has been assumed to possess a jar with a large orifice, short neck, slight shoulder, and a generally round to conical base. Bowls, cylindrical vases, and jars with round to spherical bodies, rounded bases, and constricted necks are also considered to be present (Sears 1958; Wauchope 1966).

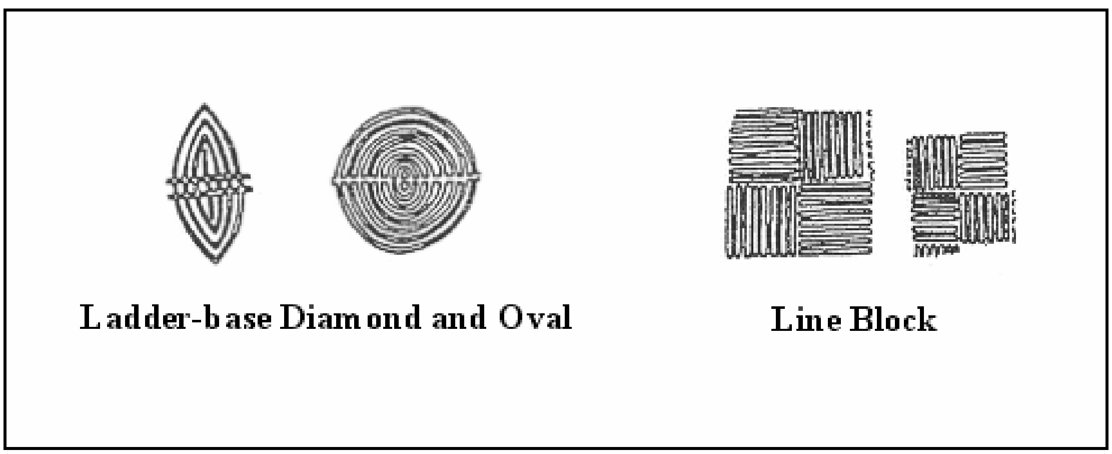

Figure 4.9 Early Etowah Complicated Stamped designs (from Wauchope 1966: Figure 25).

4.1h Summary of Ceramic Type Descriptions

From the above type descriptions, it is apparent that by the Swift Creek and Napier phases, a stamping tradition that involved a general concept of diamond-like shapes [either sharp diamonds or rounded ovals] strung together in a continuous chain across a background of parallel lines was already well established. The use of a background of parallel lines continues from the Napier phase, through Woodstock, and into Etowah. The change in design that is critical in differentiating one phase from the other is the element that is superimposed upon this background of parallel lines. This superimposed element changes from zig-zagging lines in Napier to concentric diamonds and ovals in Woodstock and finally to concentric diamonds and ovals with a bisecting "ladder" in Etowah. This stamping tradition continued to be strong throughout following Mississippian period phases.

4.2 Ceramic Analysis

To establish a ceramic chronology for the Woodstock phase, I selected collections for analysis from the Georgia Archaeological Site File (GASF) database, basing eligibility on site nature (presence of intact midden or features), type of investigation (excavation of intact deposits), and number of sherds recovered from excavation. Following these general parameters, I excluded plowzone sites, sites that were only surveyed, and collections with fewer than 140 sherds to ensure adequate sample sizes and comparability. Collections that were obtained from full-scale excavation yielded stratigraphic contexts (i.e. features, middens) that could be used to determine discrete components present at a site and the integrity of ceramic assemblages recovered from these contexts.

Ceramic assemblages recovered from contexts representing single, un-mixed components were critical to the development of a refined Woodstock chronology because they enabled me to determine the contemporaneity of certain Woodstock design elements with either earlier Swift Creek Complicated Stamped or later Etowah Complicated Stamped designs. According to the GASF database, 11 collections (Table 4.1) met these parameters and provided the basis for differentiating Early and Late Woodstock Complicated design elements.

Table 4.1 Collections selected for reanalysis.

Site Number	Site Name	Location of Collection
9CK9	Hickory Log	TRC Garrow Associates Inc., Durham, North Carolina
9CK23	Chambers	Smithsonian Institute, Washington, D. C.
9CK68		Smithsonian Institute, Washington, D. C.
9CK72		Smithsonian Institute, Washington, D. C.
9CK103		Smithsonian Institute, Washington, D. C.
9GO4	Thompson	University of Georgia, Athens
9GW70	Rivermoore	R. S. Webb, Atlanta
9GW495		R. S. Webb, Atlanta
9HY39		Cobb Institute of Archeology, Mississippi State University
9MU103	Potts' Tract	University of Georgia, Athens
9ST24	Brown Bottom	University of Georgia, Athens

4.3 Determining a Chronology

Recognizing that ceramics from Woodstock sites showed temporal variation, Caldwell (1957) suggested that temporal subdivisions might eventually be determined for

Woodstock (Hally and Rudolph 1986). Indeed, Caldwell (1953) made distinctions between Early Woodstock sites and Late Woodstock sites; Early sites exhibited a mix of Swift Creek, Napier, and Woodstock ceramics, while Late sites had a mix of Woodstock and Etowah ceramics. Furthermore, published radiocarbon dates (Table 4.2) from excavated features at four Woodstock sites in northern Georgia suggest the validity of dividing the phase into Early and Late sub-divisions.

Table 4.2 Radiocarbon dates for north Georgia Woodstock sites.

Sample ID	**Site**	**Site Name**	**Radiocarbon Age (YBP ± 1σ)**	**Calibrated Date (Range ± 1σ)[a]**	**Corrected Calendric Date (A.D)**
Beta-52427[a]	**9FL193**	Whitehead Farm I	1250 ± 100	660 - 890	772
Beta-52429[a]	**9FL193**	Whitehead Farm I	1220 ± 90	677 – 894	785
UGA-55[b]	**9MU103**	Potts' Tract	1022 ± 40	--	980 - 1000
UGA-14548[c]	**9LU1**	Chestatee	980 ± 105	--	1020

[a] Stanyard and Baker 1992.
[b] Hally 1970.
[c] Crook 1982.

To subdivide Woodstock Complicated Stamped motifs into Early and Late, I compared the relative frequencies of Swift Creek, Swift Creek B-Complex, Napier, Woodstock, and Early Etowah Complicated Stamped designs in selected collections. I recorded counts for each of the Woodstock stamped motifs (concentric diamonds, concentric ovals, and line block) and other Woodstock types (Check Stamped, Incised, and Cordmarked) (Table 4.3).

Complicated Stamped sherds that exhibited a general diamond or oval design but were broken such that a defining steep arch or rounded curve was not apparent were designated as Unidentified (UID) Diamond. Wauchope (1966:61) noted that diamonds were framed in borders ranging from two to seven lines. Therefore, to determine if the number of border lines changed through time, I counted the number of raised border lines (lands) (Cable 2000) in the concentric diamond and concentric oval motifs.

Table 4.3 Frequencies of motifs from selected Woodstock collections.

Site	Woodstock – Angular Diamond	Woodstock – Oval Diamond	Woodstock – UID Diamond	Woodstock - Line Block	Woodstock Incised	Woodstock Check Stamped	Woodstock Cordmarked	Napier Complicated Stamped	Late Swift Creek Complicated Stamped	Swift Creek B-Complex	Early Etowah Complicated Stamped
9CK9	37	48	30	14	2			6	5	5	
9CK68	7	4	12	2		2					
9CK72	1	2	5	1	1	14					
9CK103	10	5	24	7		3		1	2		
9GO4*	21	26	84	64	4	12	2				3
9GW70	106	111	316	538	5		22				19
9GW495	5	3	24	65							13
9MU103	93	76	78	119	2	9					17
9CK23			2	1		22					

* A majority of the sherds were recovered from the plowzone and were not large enough to confidently count the total number of lands and grooves surrounding the diamond motifs.

The ceramic assemblage of 9CK23 is comprised of high percentage (88 %) of Woodstock Check Stamped compared to either the diamond/oval (8 %) or line block (4 %) motifs (Table 4.4). As Woodstock Check Stamped occurs in varying percentages in a majority of the selected Woodstock sites, ceramic analysis from 9CK23 was not useful in determining Early and Late Woodstock motifs. Analysis of the ceramics from 9ST24 and 9HY39 yielded no applicable data. The ceramics from 9ST24 represented primarily Late Mississippian Lamar and Savannah Complicated Stamped designs, while the collection from 9HY39 consisted primarily of early Swift Creek Complicated Stamped designs.

Although the collection from 9CK72 was not as large as indicated by GASF records, the ceramic analysis is informative when considered in conjunction with the larger collections from nearby sites.

Table 4.4 Condensed analysis of selected collections.

	Woodstock									
Site	**Diamond**	**Line Block**	**Napier**	**Late Swift Creek**	**Swift Creek B-Complex**	**Early Etowah**	**5L, 4G***	**4L, 3G***	**3L, 2G***	**2L, 1G***
9CK9	**115** *(89)*	**14** *(11)*	6	5	5			17	14	6
9CK68	**23** (*92)*	**2** (*8)*		1						
9CK72	**8** (*89)*	**1** (*11)*						1	1	
9CK103	**39** (*85)*	**7** (*15)*	1	2			1	4	3	
9GO4	**131** (*67)*	**64** (*33)*				3				
9GW70	**533** (*50)*	**538** (*50)*				19		22	175	3
9GW495	**32** (*33)*	**65** (*6)*				13			3	1
9MU103	**247** (*67)*	**119** (*33)*				17		9	91	10

Percentages are noted in parentheses.
* L = land (raised line); G= groove (depressed line).

The frequencies of the diamond and oval motifs are relatively similar across the collections, indicating that the diamonds and ovals are probably variations of the same motif rather than different motifs altogether. I combined the counts for previously designated UID Diamonds with the concentric diamonds and ovals to form a single diamond category to better represent the relative amount of the diamond motif in the selected collections.

Evaluation of the collections revealed differences in the Woodstock Complicated Stamped concentric diamond versus line block motifs as well as differences in the number of lands and grooves surrounding the diamond motif. The relative frequencies of the *combined* diamond motif and the line block motif show that (Table 4.4) the line block motif constitutes from as little as eight percent to as much as 67 percent of the Woodstock Complicated Stamped motifs.

The number of lands and grooves also varies across the collections. Four-border line (4L, 3G) and three-border line (3L, 2G) patterns are relatively equal at 9CK9 and 9CK103, with ratios of 55 to 45 percent and 57 to 43 percent, respectively. However, the four-border line pattern appears to be slightly more prevalent. Conversely, at 9GW70, 9GW495, and 9MU103, the three-border line pattern becomes more dominant than the four-border line pattern, with ratios (4L, 3G:3L, 2G) of 11 to 89 percent, 0 to 100 percent, and 9 to 90 percent, respectively.

A distinct trend appears in the relative frequencies of the diamond and line block motifs in conjunction with the number of lands and grooves around the diamond motif. Sites with high percentages (85 % or greater) of the diamond motif tend to have a higher number of border lines surrounding the diamond designs and the co-occurrence of small amounts of Swift Creek and Napier stamped designs in Woodstock contexts (Table 4.5). Sites where the line block motif represents at least one-third (33 %) of the Woodstock Stamped designs tend to have fewer border lines and the co-occurrence of small amounts of the Early Etowah ladder-base diamond motif in Woodstock contexts (Table 4.5).

Considering the ceramic evidence, I argue that the ceramics from 9CK9 and 9CK103 represent Early Woodstock occupations. Hickory Log is a large, palisaded Woodstock occupation located on the Etowah River in Cherokee County, northeast of the other smaller sites (9CK103, 9CK68, and 9CK72) on the portion of the Etowah River that became the Allatoona Reservoir. Although a small number of Late Swift Creek and Napier sherds are present at these sites, no Early Etowah sherds are present.

Table 4.5 Description of Woodstock features from selected collections.

Site	Provenience	Description	Ceramic Inventory	Count
9CK9	Feature 7902#	Large, oval refuse pit	Woodstock Complicated Stamped Swift Creek B-Complex Stamped	59 1
	Feature 9635#	Borrow pit	Woodstock Complicated Stamped Woodstock Plain	69 11
	Feature 9645#	Borrow pit	Woodstock Complicated Stamped Woodstock Incised Woodstock Plain Swift Creek Complicated Stamped	16 1 8 1
9MU103	Feature 122# XU1	Pit	Woodstock Complicated Stamped Etowah Complicated Stamped Woodstock Plain	74 1 5
	Feature 133# XU1	Large pit	Woodstock Complicated Stamped Etowah Complicated Stamped Woodstock Incised Woodstock Plain	195 3 1 3
	Feature 143 XU1	Pit	Woodstock Complicated Stamped Etowah Complicated Stamped Woodstock Plain	20 1 2
	Woodstock Midden N450 E70	10 x 10 foot unit 95.5 bd	Woodstock Complicated Stamped Woodstock Check Stamped Etowah Complicated Stamped	9 2 1
9GW70	E Wall Trench N Side, Section 2 Level 2	Structure 1	Woodstock Complicated Stamped Etowah Complicated Stamped	25 1
	E Wall Trench N Side, Section 3 Level 1	Structure 1	Woodstock Complicated Stamped Woodstock Plain Etowah Complicated Stamped	43 4 2
	Exploratory Trench 4, Level 2		Woodstock Complicated Stamped Etowah Complicated Stamped	5 2
	DA-3 Level 1	Feature 52	Woodstock Complicated Stamped	15
	W Wall Trench Section 1, Level 2 PP#32	Structure 1 Feature 92	Woodstock Complicated Stamped Etowah Complicated Stamped	34 4
	W Wall Trench, Section 1, Level 3	Structure 1	Woodstock Complicated Stamped Woodstock Cordmarked Etowah Complicated Stamped	54 4 9
9GO4	XU3, S half 510-515N 610E Level 2	Trench	Woodstock Complicated Stamped Woodstock Plain Etowah Complicated Stamped	22 11 2

Features from which ^{14}C samples were taken.

At 9CK9, discrete Late Woodland and Early Mississippian occupations occur in different locations: only one Napier feature is present, occurring in the southern portion of the site; a few Early Swift Creek features are also present in this southern portion. However, all undetermined Late Woodland (i.e. Swift Creek/Woodstock) and pure Woodstock features are limited to the northern portion. Thus, a few Late Woodland contexts in the northern portion contain mixed Swift Creek and Woodstock ceramics.

4.4 Revised Woodstock Chronology

The **Early** Woodstock motif assemblage is dominated by the diamond design, while the line block motif is barely present. The numbers of lands and grooves surrounding the concentric diamonds and ovals are fairly consistent throughout the samples and tend toward a high number of lines. The majority of designs exhibit either four-border lines (47 percent) or three-border lines (45 percent). Only the Hickory Log ceramics exhibited two lands with one groove, but the number of sherds exhibiting this design was low (13 percent).

To assess the validity of this Early Woodstock ceramic repertoire, I submitted four samples from 9CK9 for radiocarbon analysis (Table 4.6). I selected the samples from three features that either consisted of a single, unmixed layer of fill (Features 9635 and 9645) or clearly defined layers (Feature 7902). Zone A of Feature 7902 denotes the upper layer of fill and consisted of numerous rocks; Zone B exhibited evidence for in-situ burning. Several flat lying sherds were present at the interface between Zones A and B (Webb 2001).

Table 4.6 Radiocarbon dates for features at the Hickory Log (9CK9) site.

Sample ID	Feature	Sample Type	Radiocarbon Age (YBP ± 1σ)	Corrected $\delta^{13}C$ Age (YBP ± 1σ)	$\delta^{13}C$ (Years Corrected)	Date (A.D)
UGA-14547[*]	**7902 Zone A, S ½**	Charcoal	860 ± 40	860 ± 40	-25.21 (-3)	1050 - 1130
UGA-14546[*]	**7902 Zone B, S ½, ¼**	Charcoal, Wet	1060 ± 60	1010 ± 60	-27.86 (-46)	880 - 1000
UGA-14545[*]	**9635 S ½, Sec. 2**	Charcoal	1040 ± 60	1030 ± 60	-25.89 (-14)	860 - 980
UGA-14548[*]	**9645 E ½, ¼**	Charcoal, Wet	790 ± 40	780 ± 40	-25.32 (-5)	1130 - 1210
Beta-94649[#]	**9645**	--	980 ± 60	930 ± 60	--	960 - 1080
Beta-94647[#]	**1803**	--	1150 ± 70	1100 ± 70	--	780 - 920

[*]Analysis provided by the Center for Stable Isotope Studies, University of Georgia, Athens, GA, in 2004.
[#] Analysis provided by Beta Analytic (P. Webb 2001).

The late date returned for Feature 9645 may indicate some mixing of fill, which could be expected since this feature is most likely a borrow pit used to extract clay for constructing the palisade and thus may not have been filled immediately. The date returned for Feature 1803, a palisade post, indicates an early date for the construction of the palisade, however. Therefore, although two samples returned later dates than expected, the absence of Etowah ceramics and the dates returned for the other features support the Early Woodstock assignment of Hickory Log (9CK9) and, subsequently, of 9CK68, 9CK72, and 9CK103.

Conversely, ceramic evidence indicates that the large Woodstock occupations on the Coosawattee River (9GO4 and 9MU103) and Chattahoochee River (9GW70 and 9GW495) are Late Woodstock occupations. Both 9GO4 and 9MU103 are multi-component sites, having been occupied during the Woodstock and late Mississippian Lamar phases. Two occupations are also indicated at 9GW70: a pure Woodstock occupation in the northern portion of the site and a few Swift Creek features in one section of the southern portion (Steve Webb, personal communication 2002). 9GW495 is a single-component, Woodstock site. Although a small number of Early Etowah sherds are present at each of these sites, no Late Swift Creek and Napier sherds are present.

The **Late** Woodstock design repertoire is characterized by a dramatic increase in the line block motif. The line block motif occurs at least three times more frequently than during Early Woodstock. The increase in the occurrence of the line-block motif argues for a Late Woodstock designation, as ceramics in the succeeding Early Etowah phase (A.D. 1000 to A.D. 1100) are characterized by the exclusive use of ladder-base diamond and line-block motifs (Caldwell 1953; King 2001). Wauchope's discussion of Woodstock and Etowah ceramics supports this assertion, as the line-block motif "exceeded diamonds in popularity at the proto-Etowah sites (65% at Conn Creek, Ck-16), which is to be expected since it occurs also … in the Early Mississippi Woodstock Stamped" (1966:65). Additionally, the number of border lines surrounding the diamond design declines through time such that the three border line form becomes almost exclusively used (88 percent at 9GW70 and 83 percent at 9MU103).

To assess the validity of this Late Woodstock ceramic repertoire, I submitted three samples from 9MU103 for radiocarbon analysis (Table 4.7). I selected the samples from features that either consisted of a single, unmixed layer of fill (Features 83 and 122) or several clearly defined layers (Feature 133). Although considerable care was taken during excavation to separate intrusive postholes from the fill of Feature 133, it is possible that the charred wood sample (UGA-14551) used for radiocarbon dating was recovered from one of the later Lamar postholes. Thus, the dates returned for the other features and the absence of Swift Creek and Napier ceramics from these collections support the Late Woodstock assignment of Potts' Tract (9MU103) and, subsequently, of 9GO4, 9GW70, and 9GW495.

Table 4.7 Radiocarbon dates for features at the Potts' Tract (9MU103) site.

Sample ID	Feature	Sample Type	Radiocarbon Age (YBP ± 1σ)	Corrected $\delta^{13}C$ Age (YBP ± 1σ)	$\delta^{13}C$ (Years Corrected)	Date (A.D)
UGA-14550*	**83***	Charred Walnut	790 ± 180	730 ± 180	-28.45 (-55)	1040 - 1400
UGA-14549*	**122 LN 320**	Charred Wood	980 ± 50	950 ± 50	-27.11 (-34)	950 - 1050
UGA-14551*	**133 LN 327**	Charred Wood	520 ± 170	510 ± 170	-25.78 (-13)	1270 - 1610
UGA-55#	**133**	Charcoal	1022 ± 40	--	--	888 - 968

* Analysis provided by the Center for Stable Isotope Studies, University of Georgia, Athens, GA, in 2004.
\# Analysis provided by the Geochronology Laboratory, University of Georgia, Athens, GA (Hally 1970).

During the Late Etowah phase and the succeeding Middle Mississippian Wilbanks phase at the Etowah site (9BR1), the line block motif declines and several variations of a "concentric" theme appear. These concentric variations are designated as concentric-diamond, -square, -oval, and -circle and are characterized by the design element (e.g. square) becoming increasingly smaller toward the center. One might characterize the increase in concentric diamond or concentric oval designs as an increase in the number of border lines surrounding the Woodstock diamond motif through time rather than the decrease noted above. Although seemingly contradictory, when viewed in light of ceramic evidence from succeeding Mississippian phases, it is apparent that the concentric motif is related to later Mississippian designs (Table 4.8).

Table 4.8 Frequency[#] of stamped motifs in Late Etowah and Wilbanks contexts.

Motif	Early Etowah	Late Etowah	Early Wilbanks	Late Wilbanks
Ladder-base Diamond	78% (208)	57% (103)	13% (8)	3% (3)
Line Block	1% (3)	1% (2)	--	1% (1)
One-Bar Diamond	0.4% (1)	--	--	1% (1)
Two-Bar Diamond	19% (51)	35% (64)	2% (1)	1% (1)
Concentric Design	0.8% (2) [a]	3% (5) [a]	21% (13) [b]	39% (39) [b]
Filfot Cross	0.4% (1)	4% (8)	--	1% (1)
Figure 9	--	--	56% (35)	40% (40)
Figure 8	--	--	--	2% (2)
Scroll	--	--	2% (1)	--
Bull's Eye	0.4% (1)	--	6% (4)	8% (8)

[#] Counts and frequencies derived from King 2001. Counts are in parentheses.
[a] Includes concentric- diamond, square, oval, and circle for Early and Late Etowah.
[b] Only the concentric-circle design is present in Early and Late Wilbanks.

A remarkable decline in the ladder-base diamond design through time (Table 4.8) and the extremely low occurrence of the line block motif by Early Etowah indicates that the line block motif may be relatively restricted to the Woodstock phase and therefore diagnostic of only the earliest of Etowah occupations. The rise of "concentric" designs to constitute almost 40 percent of the design assemblage suggests that a distinct shift in motifs occurs between the Early Mississippian (Etowah) and Middle Mississippian (Wilbanks) period. The concentric-circle design appears to be closely related to the concentric Figure 9 motif, with the two motifs collectively representing 77 percent of the Early Wilbanks designs and 79 percent of the Late Wilbanks designs.

In sum, the differing frequencies of the Woodstock Complicated Stamped diamond and line block motifs (Table 4.9) together with the changes noted in the number of border lines surrounding the diamond motif provided the basis for establishing Early and Late Woodstock motif assemblages. Early Woodstock assemblages should be characterized by a high frequency of the diamond (85% or greater) motif and a high number of border lines (46% or greater exhibiting four border lines).

Table 4.9 Summary counts for Early and Late Woodstock ceramic assemblages.

	Site Number	**Diamond**	**Line Block**	**4L, 3G**	**3L, 2G**	**2L, 1G**
EARLY	9CK9	115 *89%*	14 *11%*	17 *46%*	14 *38%*	6 *16%*
	9CK103	39 *85%*	7 *15%*	5 *62%*	3 *38%*	--
	9CK68	23 *92%*	2 *8%*	--	--	--
	9CK72	1 *89%*	1 *11%*	1 *50%*	1 *50%*	--
LATE	9GW495	32 *33%*	65 *67%*	--	3 *75%*	1 *25%*
	9GW70	533 *54%*	447 *46%*	22 *11%*	175 *87%*	3 *2%*
	9MU103	247 *67%*	119 *33%*	9 *8%*	91 *83%*	10 *9%*
	9GO4	131 *67%*	64 *33%*	--	--	--

Conversely, Late Woodstock sites should be assignable according to an increased frequency of the line block motif (33% or greater) and a lower number of border lines. Radiocarbon dates for Woodstock sites in north Georgia (Table 4.9) corroborate an Early and Late Woodstock division. With the establishment of Early and Late Woodstock motif assemblages, the determination of contemporary sites, and eventually settlement clustering and changes therein, is possible (see Chapter 8: Defining Woodstock Clustering).

CHAPTER 5

SUBSISTENCE DATA

5.1 The Relation between Subsistence and Cultural Changes

The connections between the intensification of subsistence practices and the increasing elaboration of political systems have been "a topic of long-standing interest" to archaeologists in general and to Mississippian scholars in particular (Scarry 1993a:87). An understanding of why independent, egalitarian populations began to organize themselves into hierarchical systems lies in the consequences of the abandonment of a hunting and gathering lifestyle in favor of an agricultural strategy. The various explanations regard this shift in procurement strategies as a response to stress. The explanations differ, however, in where they locate the source of stress: in the physical or the social realm (Bellwood 2005; Kennett and Winterhalder 2006).

Early explanations for the rise of civilizations in the Near East reflect this interest, correlating cultural changes (i.e. changes in social and political organization) with the shift from a mobile, hunting and gathering lifestyle to a more sedentary, farming lifestyle, following the domestication of plants such as wild wheat. The domestication process occurred rapidly in oases where humans and potential domesticates concentrated during the onset of dry conditions at the end of the Pleistocene (Childe 1928). Other explanations relate to changes in the social environment. According to Cohen (1977), growing hunter-gatherer populations began to exceed the carrying capacity of their environment, resulting in food shortages that pushed these groups to experiment with plant and animal domestication. Such experimentation eventually led to full-blown agriculture. Alternatively, in resource-rich areas that were not circumscribed by an increasing population, agriculture may have been stimulated by individuals consciously striving for opportunities of personal gain (Cowgill 1975). In such situations, status-seeking individuals encouraged and controlled the production of domesticates to generate surpluses that could be used for social ends such as competitive feasting and alliance formation (Hayden 1990).

Each argument alone falls short of explaining the shift toward agriculture. Additionally as most proposed stresses overlap, any useful overall explanation will recognize that each force was likely an important factor in the process (Kennett and Winterhalder 2006). According to Bellwood (2005), the most popular model proposes that agriculture essentially developed through processes of risk minimization in response to fluctuations in environmental conditions during the early or middle Holocene.

The shift toward agriculture increased vulnerability to environmental fluctuations, which necessitated the development of cultural buffering mechanisms (Cohen 1977). These buffering mechanisms included the development of a centralized authority that could minimize the risks associated with increased environmental vulnerability. The integration of multiple communities under a centralized authority could minimize the risk of localized crop failure by organizing land allocation and scheduling labor needed to plant crops.

The attendant upsurge in population density resulted in reduced land availability and increased competition for resources, which necessitated the development of new technologies and environmental modification (e.g. irrigation). Thus, intensification of production to meet the demands of a growing population led to new types of problems (Johnson and Earle 2000). Fertile bottomlands become less available but more desirable, requiring effective defense against seizure from outside communities. To buffer against uncertain harvests and the depletion of local resources, community food storage or reciprocal feasting arrangements between communities may have been established. Regional exchange networks were established to provide communities with basic foodstuffs or with materials needed for making tools (e.g. stone for making axes). Each solution requires economic integration of communities and powerful leadership, creating opportunities for control that enable nonproducing elites to demand a share of production (Johnson and Earle 2000). By organizing labor and controlling the development (Johnson and Earle 2000) and redistribution (Haas 2001) of resources, chiefs were able to gain political power and control over entire regions.

According to Childe (1928), civilizations eventually arose in these areas through the generation of surplus wealth (crop production) and the concentration of political power in the hands of surplus producers. Thus, the first civilizations were the result of the transformation of tribal agricultural societies into hierarchical systems through the manipulation of surplus wealth by a dominant elite class to produce monumental architecture and art to serve as public expressions of their status (Childe 1928).

In the Southeastern United States, strong connections have been made between the intensification of subsistence practices and the increasing elaboration of political systems. There is a long history of citing a dependence on maize agriculture as a defining characteristic of the Mississippian period (Griffin 1967, 1985; Muller 1997; Peebles and Kus 1977; Scarry 1996b; Smith 1985; Willey and Phillips 1958).

Mississippian chiefs alternately have been discussed as arising from a need for risk-managers who could buffer the threat of crop failure or as resource manipulators who parlayed crop surpluses into building prestige. In the American Bottom, growing populations necessitated a change in the subsistence program from a horticultural system based on indigenous seed-bearing plants toward a reliance on maize (Milner 1998; Rindos and Johannessen 1991). Although maize cultivation requires additional labor inputs in terms of cultivation (weeding, single seed planting), maize requires less labor to process than native seeds as the ear is “far larger and more compact” than small seeds (Smith 2003:120). Lopinot (1992), however, asserts that differences in labor costs “are not supported by empirical data.” This subsistence shift toward maize cultivation resulted in the development of risk-managing chiefly political organizations (Ford 1974; Johnson and Earle 2000; Muller 1978, 1997; Scarry 1993a; Scarry 1996b).

Conversely, in the Black Warrior River valley, changes in subsistence regimes were related to social rather than demographic pressures. The restriction of the production of axes and nonlocal prestige goods to Moundville created the opportunity for elites to monopolize control over a part of the economy and to demand a share of production through tribute (Welch 1996). By controlling access to axes, which are needed to clear fields, the chief indirectly controlled subsistence production (Welch 1996). The restriction of nonlocal prestige goods to Moundville afforded the chief “an advantage in … competition for … political power” (Welch 1996:89). Competition for prestige thus resulted in the intensification of crop production, increased demands for surplus production, and the institutionalization of wealth-based status differences (Childe 1936, 1942; Earle 1997; Scarry 1993a; Scarry 1996b; Welch 1991).

In light of the above examples, it is clear that changes in subsistence systems affect social and political organization. Because practices of producing and distributing food are important means of "defining and redefining social relationships" (Hastorf and Johannessen 1994:427), understanding changes in food systems is crucial to gaining insights into past cultural dynamics. Identification of changes in food production strategies is therefore important for understanding the evolution of political systems. Developing a fuller picture of the changes in subsistence in north Georgia during the Woodstock phase is essential to understanding the evolution of centralized political systems and the rise of Mississippian culture in north Georgia.

5.2 Subsistence Background

The following background has been constructed from a review of archaeobotanical literature that specifically pertains to the cultivation of native seed crops and maize in the Eastern Woodlands (see Scarry 2003:Figure 3.1). The vast majority of the plant evidence used to construct this background is from research conducted in the upper Mississippi Valley and the mid-West; plant evidence from the nuclear Southeast (e.g. Georgia, Alabama, and South Carolina) is lacking. Although aquatic, terrestrial and avian resources were exploited to meet subsistence needs, this dissertation will focus only on archaeobotanical data.

5.2a Archaic to Late Woodland

Between 3000 and 1500 B.C., four seed-bearing plants were brought under domestication by native groups whose subsistence was based on hunting, fishing, and gathering wild plant foods. These initial domesticates were squash (*Cucurbita pepo* ssp. *ovifera*), chenopod (*Chenopodium berlandieri* var. *jonesianum*), marshelder (*Iva annua* var. *macrocarpa*), and sunflower (*Helianthus annuus* var. *macrocarpus*) (Smith and Cowan 2003). Smith and Cowan (2003) argue that squash, chenopod, and marshelder were more easily domesticated. The production of abundant quantities of nutritional seeds and the rapid and aggressive colonization of disturbed river valley soils enabled these plants to be initially cultivated in similar disturbed-soil settings created around prehistoric settlements. By 1000 B.C., three other seed crops had been added: maygrass (*Phalaris caroliniana*), erect knotweed (*Polygonum erectum*), and little barley (*Hordeum pusillum*) (Smith and Cowan 2003).

Between 500 B.C. and A.D. 200, a shift toward a greater reliance on food production occurred in river valley and upland settings across the Eastern Woodlands. This increasing reliance on food production varied from one area to another in terms of the importance of different crops based on seasonality (fall or spring maturing) and seed type (starchy versus oily) (Scarry 2003; Smith and Cowan 2003). Little barley and maygrass are spring-maturing starchy-grain grasses; chenopod and erect knotweed are fall-maturing starchy seeds; and sunflower, squash, and marshelder are fall-maturing oily seed plants (Smith and Cowan 2003).

By A.D. 100 to A.D. 200, maize was incorporated into these various food-producing economies as evidenced by the recovery of maize from Middle Woodland contexts at the

Harness site in south-central Ohio, the Holding site in the American Bottom, and the Icehouse Bottom site in eastern Tennessee (Smith and Cowan 2003). However, although maize has been recovered from various Woodland sites throughout the Southeast, it had a minimal dietary presence for more than 600 years after its introduction (Gremillion 2003; Smith and Cowan 2003). Why maize became the dominant cultivar during the Mississippian period is unknown, but explanations have suggested that its selection was based on the availability of newer and better acclimated varieties of maize or the ability to produce increased maize yields with minimal additional inputs (Scarry 1993a:89-90).

Although stable isotope studies reveal that pre-Mississippian populations consumed little to no maize (Lynott et al. 1986; Ambrose 1987), radiocarbon dating of maize fragments confirm the presence of maize at Middle Woodland (A.D. 200) sites (Chapman and Crites 1987). The occurrence of maize in small quantities and in limited contexts (e.g. associated with mounds or central, communal areas) suggests that maize initially may have served more of a social or ceremonial role than a dietary one (Hastorf and Johannessen 1994; Muller 1997; Scarry 1993a; Smith and Cowan 2003; Wymer 1994).

Conversely, the lag may be a result of preservation bias. If maize was harvested green and consumed in a boiled state, the cobs and kernels would be less likely to be preserved. The substantial labor investment required for field preparation and cultivation may have been a deterrent to its full incorporation until changes in the political climate around A.D. 800 to A.D. 900 created an economic demand for surplus production (Smith and Cowan 2003). It has also been argued that the plant needed this time lag to acclimate to the temperate climate of the Eastern Woodlands (Fritz 1992; Keegan and Butler 1987; Scarry 1993a). In the 1960s and 1970s, explanations for the development of ranked agricultural societies in the Eastern Woodlands focused on the availability of better acclimated varieties of maize, particularly the introduction of a superior Northern Flint variety (Fritz 1992). Research in the 1980s and 1990s challenged these earlier explanations for the development of ranked agricultural societies, citing that maize was already adapted to the temperate North American climate when it arrived in the Eastern Woodlands (Fritz 1992). Thus, as productive maize varieties were available to groups prior to the Mississippian period but not intensively cultivated, Hastorf and Johannessen dismiss arguments that the sudden transformation of maize into a dietary staple was based on maize being a more superior crop (see Hastorf and Johannessen 1994 for a detailed discussion).

5.2b Late Woodland and Emergent Mississippian

The archaeobotanical record of food production in the Late Woodland period is characterized by great interregional variability. In the Upper Mississippi and Ohio River valleys, subsistence was based on native seed crop cultivation in conjunction with hunting, fishing, and the gathering of wild plant foods (Fritz 1993; Gremillion 2002; Scarry 2003, 1993a). Because these groups were cultivating and storing small grain crops (maygrass, chenopod, knotweed, and little barley) as well as squash/gourd and maize, Johannessen (1993a) has argued that they should be regarded as full-scale farmers. In the piedmont and coastal plain of Georgia, Alabama, and eastern Mississippi, subsistence was based primarily on hunting, fishing, and the gathering of wild plant foods with only minor cultivation of native seed crops (Cobb and Garrow 1996; Cobb and Nassaney 1995; Rudolph 1991; Scarry 2003, 1993a; Wood and Bowen 1995).

Upper Mississippi and Ohio River Valleys

By the end of the Late Woodland period, botanical data indicate that a shift toward intensive maize cultivation was underway, whether it was simply added to existing large-scale farming systems as in the Upper Mississippi and Ohio River valleys or supplanted foraging and small-scale crop production systems as in west Alabama and eastern Mississippi (Anderson and Mainfort 2002a; Johannessen 1993a; Scarry 2003, 1993a). Whatever the cause of the time lag, maize is the predominant plant food remain in post-A.D. 900 archaeobotanical assemblages from much of the Eastern Woodlands (Smith and Cowan 2003).

Increased production of maize in the context of a continued reliance on native cultigens (maygrass and sunflower) and collected nut and fruit resources reflects the subsistence strategies of Martin Farm phase groups in Tennessee, Emergent Mississippian groups in the American Bottom, and the Late Woodland groups of the Mid-Ohio Valley (Boyd and Schroedl 1992; Scarry 1993a; Wymer 1994). A mixed-crop subsistence strategy incorporates the greater efficiency and flexibility of maize with the reliability of native cultigens and buffers the effects of environmental variability and the risk of total crop loss in bad years (Rindos and Johannessen 1991). During Cahokia's prominence, a subsistence strategy based on the cultivation of both native and non-native crops balanced key production factors such as workload, reliability and yield of harvests, and storage potential (Milner 1998). Maize is a high-yielding crop but is subject to greater variability in yield than native cultigens that have a greater tolerance to soil and moisture conditions (Milner 1998; Rindos and Johannessen 1991; Scarry 1993b). Although maize required more up-front effort in preparing and maintaining fields, less time was required for harvesting and maize could be more easily processed and stored; maize surpluses could be easily stored on the ear throughout the winter months (Lopinot 1992; Milner 1998; Smith and Cowan 2003).

At the beginning of the Emergent Mississippian period, “the balance was tipped decisively toward the advantages [high-yield and storability] that maize offered,” as intensive maize cultivation could support increasing populations (Milner 1998:75; Rindos and Johannessen 1991). Population increase and subsequent changes in settlement patterns are correlated with maize cultivation in the American Bottom and eastern Tennessee and the associated effects of intensive maize cultivation upon local agroecologies (e.g. cutting of forests to clear land for fields) that were caused by a need for more farm land (Milner 1998; Rindos and Johannessen 1991; Schroedl et al 1990).

In the American Bottom, where maize is present it is found in no more than in 0 to 5% of the features analyzed from Late Woodland Patrick and Mund phase contexts (Kelly 1992). Considering the number of Late Woodland sites that have been investigated in this region, these low percentages affirm that “maize is indeed rare” (Kelly 1992:174). The ubiquity of maize in terminal Late Woodland Sponemann phase (A.D. 700 to A.D. 750) features reaches 30% (Kelly 1992). The subsequent Emergent Mississippian (A.D. 750 to A.D. 1000) phase sees a continued rise in the presence of maize kernels and cob fragments. With ubiquity exceeding 50% of the features sampled (Kelly 1992:180), maize production was intensified throughout the American Bottom region around A.D. 750 (Hastorf and Johannessen 1994; Johannessen 1984; Rindos and Johannessen 1991).

The relationship between the intensification of native seeds, and ultimately of maize, to changes in the quantity of acorns further reflects the intra-regional variability of food production systems across the Southeast. In the Mid-Ohio Valley and the American Bottom the intensification of native starchy seeds occurred in the context of a continued dominance of hickory (oily) nuts (versus other nuts) and a decreasing reliance on acorns; acorn use further declined with the intensive cultivation of maize (Johannessen 1984; Scarry 2003).

Alabama and Georgia Piedmont

In the Black Warrior River Valley, the Late Woodland West Jefferson phase (A.D. 900 to A.D. 1050) is characterized by wild plant seeds, abundant nuts, some native seed crops (chenopod and maygrass) and small amounts of maize. A dramatic increase in the production of maize occurred from early to late West Jefferson (Johannessen 1993a; Scarry 1993b) such that at the West Jefferson/Moundville I (A.D. 1050 to A.D. 1250) transition, maize remains are ubiquitous (Scarry 1993a, 1993b). When native seed to acorn nut ratios are compared to the American Bottom, the West Jefferson and Moundville I assemblages suggest that native crops were considerably less important than they were in the Upper Mississippi River valley. In contrast to the American Bottom, the intensification of maize production in the Black Warrior River valley did not occur in the context of an existing intensive horticultural system based on native cultigens but rather represents a radical shift in production and procurement strategies (Scarry 1993b).

In the Brasstown Valley of northern Georgia, the dietary role of native seed cultigens such as maygrass and goosefoot diminished, and the quantity of acorn nutshell declined as the occurrence of maize increased during the Early Etowah phase (Raymer and Bonhage-Freund 2000). A similar pattern occurs in the Mid-Ohio Valley (Johannessen 1984). The presence of fruits and berries of taxa typical of second-growth forests (e.g. grapes, blackberries, and persimmon) and seeds from early successional plants in terminal Late Woodland and Early Mississippian archaeobotanical assemblages points to the extensive clearing of land for cultivation and the natural process of reclamation following field abandonment (Milner 1998; Wagner 2003; Wymer 1994).

In the Black Warrior River valley, the quantity of acorn nutshell in the paleobotanical record increases from the Middle Woodland through Early Mississippian periods and native seed cultivation remains minimal (Scarry 2003). Toward the end of the Late Woodland period, shortly before maize becomes ubiquitous, native seed production appears to have intensified in the Black Warrior River valley, as evidenced by a greater abundance of native seeds in the archaeobotanical assemblages (Scarry 2003).

Scarry (2003) suggests that the differing distributions of acorns and native seeds reflects different means of obtaining carbohydrates. In the American Bottom, demands for carbohydrates were met by cultivating starchy seeds. In the Black Warrior River valley, demands were met by intensifying the collection of acorns. The shift toward intensification of native seeds and maize in terminal Late Woodland contexts in the Black Warrior River valley suggests that demands for carbohydrates were higher than managed acorn groves could support and that intensifying the cultivation of native seeds and maize was necessary to meet increasing demands.

The above discussion reveals that the rise of ranked agricultural societies in the Eastern Woodlands, i.e. the Cahokia and Moundville chiefdoms, involved an initial stage of intensified food production. This period of intensification of production lasted between 50 and 75 years and was followed by a second stage involving the centralization of political authority (Knight 1997). In both chiefdoms, the period of initial intensification corresponds to terminal Late Woodland contexts, while the subsequent period of political centralization corresponds to Early Mississippian contexts. Thus, investigation of subsistence changes during the Late Woodland Swift Creek through Early Mississippian Etowah phases is essential to the developing a similar understanding of chiefdom development in north Georgia.

5.3 Current Understanding of Woodstock Subsistence

At this point it is generally accepted that no clear evidence of intensive maize cultivation exists for terminal Late Woodland contexts in northern Georgia (Hally and Rudolph 1986; Rudolph 1991). According to currently published data, Cobb and Garrow (1996) characterize the Woodstock phase as having a broad-spectrum subsistence strategy with a heavy reliance on nuts (hickory, walnut, and acorn) in which cultigens minimally supplemented the diet. The authors state that the lack of ethnobotanical analysis of samples from excavated Woodstock sites has made "quantitative comparisons with subsistence patterns" of contemporary Emergent Mississippian groups "dangerous" (Cobb and Garrow 1996:29). Furthermore, they note that evidence for maize cultivation is minimal, which makes the determination of its relative importance to the Woodstock diet "problematic" (Cobb and Garrow 1996:29).

Published data indicate that four Woodstock sites (9BR139, 9FL193, 9GO59, and 9MU103) (see Figure 1.3) have yielded evidence for maize cultivation. At the Stamp

Creek site (9BR139), two maize kernels were recovered from excavated contexts (Caldwell 1957). A small amount of maize was found in a pit feature at the Lum Moss site (9GO59). Although the pit feature lacked diagnostic ceramics, the Woodstock phase is the only component represented at Lum Moss. Furthermore, the feature returned a radiocarbon date of A.D. 980 ± 95 (Baker 1970).

At Whitehead Farm I (9FL193), Stanyard and Baker (1992) recovered 14 cupule fragments and three glume fragments from a single feature (Subfeature 2.03). The feature is assigned to the Woodstock phase based on a corrected radiocarbon date of A.D. 974 and the presence of Woodstock Complicated Stamped and Woodstock Incised ceramics in the absence of other decorated ceramics (Stanyard and Baker 1992:50). An additional single cupule fragment was recovered from a non-feature context.

Excavation of pit features at Potts' Tract (9MU103) produced small amounts of maize. O'Hear's (1990) analysis of a small portion of a flotation sample recovered from a Woodstock pit feature (Feature 133) identified two cupules and six kernel fragments, constituting 9.4% of the plant food remains recovered from the pit. Nutshell (hickory, acorn, and walnut) made up the majority of remains (88%), while fleshy fruit seeds rounded out the sample (2.6%) (O'Hear 1990:Table 5). No other cultigens were identified.

Ethnobotanical data available to Cobb and Garrow in 1996 was limited to the information provided from the four sites discussed above: 9BR139, 9FL193, 9GO59, and 9MU103. These data indicated that maize was being incorporated into the Woodstock diet but did not provide a basis for determining its relative importance. This situation has changed markedly in the past few years. Since 1996, several projects have recorded

Woodstock plant remains in unpublished reports. Following is a discussion of the data reported from large-scale excavations at 9CK9, 9TO48, and 9GW70 (see Figure 1.3). Macrobotanical maize remains at theses sites indicate that maize was a consistent component of the Woodstock diet, echoing the importance of maize as a dietary mainstay in the American Bottom and the Black Warrior River valley from Emergent Mississippian phases onward (Milner 1998; Scarry 1993a, 1993b).

Hickory Log (9CK9) is a large, palisaded Woodstock occupation located in Cherokee County northeast of the portion of the Etowah River that became the Allatoona Reservoir. Discrete Late Woodland and Early Mississippian occupations occur in different portions of the site. A single Napier feature and a few Early Swift Creek features are present in the southern portion of the site. Conversely, the Early Mississippian component is limited to the northern portion based on the restriction of all Woodstock features to this area. No Etowah ceramics are present.

Archaeobotanical remains have been analyzed from flotation samples derived from 17 pit features in the northern part of the site (Webb 2001). Sampled features include one Napier pit, four Swift Creek pits, and eight Woodstock pits (Table 5.1). Cultural assignment of these features is based on ceramic classification conducted by TRC Garrow and Associates, the cultural resource management firm who excavated the site in 1994 (see the discussion of the excavation of 9CK9 in Chapter 3.3a). The following discussion summarizes the archaeobotanical analysis from the Late Woodland (Table 5.2) and Early Mississippian (Table 5.3) samples that were analyzed by TRC Garrow and Associates in 2000.

Table 5.1 Features containing archaeobotanical material at 9CK9 (Webb 2001).

Phase	Feature	Description	Diagnostic Ceramics*	Count*
Napier	**1031**	*Circular refuse pit*	Napier Complicated Stamped Bowl Napier Complicated Stamped	1 4
Swift Creek	**6119**	*Circular burial pit*	Swift Creek Complicated Stamped Jar	1
	6962	*Oval burial pit*	Swift Creek Complicated Stamped	1
	6967	*Circular burial pit*	Swift Creek Complicated Stamped	1
	7010	*Oval refuse pit*	Swift Creek Complicated Stamped Jar Swift Creek Complicated Stamped Swift Creek B-Complex Stamped	1 5 1
Woodstock	**6116**	*Oval burial(?) pit*	Woodstock Complicated Stamped	3
	6227	*Oval borrow pit*	Woodstock Complicated Stamped	1
	6330	*Circular refuse pit*	Woodstock Complicated Stamped	3
	7902	*Oval refuse pit*	Woodstock Complicated Stamped Jar Woodstock Complicated Stamped Swift Creek B-Complex Stamped	4 59 1
	8052	*Circular refuse pit*	Woodstock Complicated Stamped	1
	9208	*Circular refuse pit*	Woodstock Complicated Stamped	7
	9635	*Irregular borrow pit*	Woodstock Complicated Stamped Jar Woodstock Complicated Stamped	7 69
	9645	*Irregular borrow pit*	Woodstock Complicated Stamped Woodstock Incised Swift Creek Complicated Stamped	16 1 1

*Sherd types and type counts based on analysis conducted by TRC Garrow (P. Webb 2001).

Table 5.2 Subsistence analysis for Napier and Swift Creek features at 9CK9 (P. Webb 2001).

Feature	**1031**		**6119**		**6962**		**6967**		**7010**	
Liters floated	167		79		53		41		6	
	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]
NUTSHELL										
Carya sp. (hickory)	35+	2.2	9	<0.1	100+	2.4	28	0.3	6	<0.1
Juglans nigra (walnut)	1	<0.1			6	<0.1	4	0.1	2	<0.1
Quercus sp. (acorn) meat	2	<0.1								
Quercus sp. (acorn) shell	60+	0.6	11	<0.1	61	<0.1	2	<0.1	2	<0.1
SEEDS, FRUITS, MAIZE										
Cucurbita sp. (squash) [rind]*	1F	<0.1					4F	<0.1		
Passiflora incarnata (maypop)	1F	<0.1							1F	<0.1
Passiflora lutea	1W	<0.1								
Phalaris caroliniana (maygrass)*							10W	<0.1	2W	<0.1
Polymnia canadensis (bearsfoot)	3F	<0.1								
Vitis sp. (grape)					1F	<0.1				
Zea mays (maize) cupule					1F	<0.1	2F	<0.1		
Zea mays (maize) kernel							2F	<0.1		
UID (grass or little barley)*							11W 6F	<0.1		
SUMMARY STATISTICS										
Nut shell density (g/10 l)		0.17		0.01		0.49		0.07		0.17
Maize density (g/10 l)		0.00		0.00		0.02		0.02		0.00
Seed density (ct./10 l)		0.48		0.00		0.02		0.02		0.00

* Denotes native cultigens used for comparative purposes in Table 5.2.
[a] Weight is measured in grams (g).

Table 5.3 Subsistence analysis for Woodstock features from 9CK9 (P. Webb 2001).

Feature Liters floated	**6116** 11		**6227** 13		**6330** 10		**7902** 21		**8052** 15		**9208** 10		**9635** 229		**9645** 36	
	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]
NUTSHELL																
Carya sp. (hickory)	2	<0.1	1	<0.1	14	0.1	10	<0.1		<0.1	8	0.1		3.7	30	0.3
Castanea dentata (chestnut)													1?	<0.1		
Juglans nigra (walnut)													3	<0.1		
Quercus sp. (acorn) meat			5	<0.1									1	<0.1	40	<0.1
Quercus sp. (acorn) shell	19	<0.1			2	<0.1	3	<0.1			3	<0.1	116	0.5	100+	2.2
SEEDS, FRUITS, MAIZE																
Chenopodium (chenopod)*													4W	<0.1		
Cucurbita sp. (squash) [rind]*			3F?	<0.1												
Helianthus annus (sunflower)*													1W	<0.1		
Lagerneria (gourd) [rind]	1F	<0.1														
Passiflora incarnata (maypop)													2W 7F	<0.1	9F	<0.1
Phalaris caroliniana (maygrass)*					1W	<0.1	3W 1F	<0.1					146 W8F	0.1	8W	<0.1
Phaseolus (bean)													7F?	0.1		
Polymnia canadensis (bearsfoot)	126F	<0.1														
Sambucus canadensis (elderberry)															1W	<0.1
Vitis sp. (grape)					1F	<0.1	1W	<0.1					3W 8F	<0.1	2F	<0.1
Zea mays (maize) cupule					3W 7F	<0.1	1W 3F	<0.1					2W 22F	<0.1		
Zea mays (maize) kernel													1W 40F	0.5	1F	<0.1
Zea mays (maize) unspecified									3F?	<0.1						
SUMMARY STATISTICS																
Nut shell density (g/10 l)		0.09		0.08		0.10		0.08		0.07		0.01		0.36		0.22
Maize density (g/10 l)		0.00		0.00		0.10		0.08		0.07		0.00		0.05		0.03
Seed density (ct./10 l)		0.00		98.5		0.17		3.85		6.67		0.00		12.3	5.56	

* Denotes native cultigens used for comparative purposes in Table 5.2.

[a] Weight is measured in grams (g).

Comparison of the archaeobotanical data (Table 5.4) reveals that nutshell comprises the most common subsistence remain in both Late Woodland phases, constituting 99% of the Napier and 86% of the Swift Creek remains. However, nutshell constitutes only 57% of the Woodstock remains. Native cultigens are barely present in the Napier sample but increase to 12% in the Swift Creek phase and 29% in the Woodstock phase.

Table 5.4 Summary of counts and percentages of edible remains by phase for 9CK9.

	Napier	**Swift Creek**	**Woodstock**
Hickory	35	143	65
*% of hickory in total**	*35%*	*53%*	*11%*
Walnut	1	12	3
*% of walnut in total**	*1%*	*5%*	*<1%*
Acorn	62	76	273
*% of acorn in total**	*63%*	*28%*	*46%*
Cultigens	1	33	175
*% of cultigens in total**	*1%*	*12%*	*29%*
Maize	0	5	83
*% of maize in total**	*0%*	*2%*	*14%*
% of maize in total cultigens	*0%*	*13%*	*32%*

*total denotes total edible remains

The data show that maize remains, while not present at all in the Napier sample are minimally present in the Swift Creek samples (2%) but notably increase by the Woodstock phase to constitute 14% of the edible remains. Maize makes up 13% of the cultigens for the Swift Creek phase but 32% of cultigens by the Woodstock phase. Moreover, 62.5% of sampled Woodstock features (n=8) contained maize (Table 5.3). According to Tickner (Appendix B:231), this pattern is consistent with the "beginnings of maize dominance."

Although the results reveal that 50% of the sampled Swift Creek features (n=4) from Hickory Log also contained maize (Table 5.2), reanalysis of the ceramics from 9CK9 reveals that two features containing maize (Features 6962 and 6967) should actually be assigned to the Woodstock phase occupation (for further discussion of the Woodstock ceramic assemblage, see Chapter 4). With the addition of these two features, maize remains would be found in 70% of the sampled Woodstock features and would be absent from both the Swift Creek and Napier samples. Although the reassignment of these features affects the ubiquity of maize for the Swift Creek and Woodstock occupations, the relative percentages of edible remains constituted by nutshell, native cultigens, and maize remain basically unchanged (< 1% change per category). The dominance of nut remains and the low presence of cultigens in the Swift Creek and Napier samples are consistent with the Late Woodland pattern identified by Scarry (2003) for the piedmont and coastal plain of Georgia, Alabama, and eastern Mississippi.

Excavations of 9TO48, a large, palisaded Woodstock occupation within the Brasstown Cluster, located in the Brasstown Valley in the Tennessee River drainage, also provide subsistence data. Broad-scale machine stripping allowed for the extensive excavation of four large loci at 9TO48. Extensive sampling of the palisade post holes yielded a high proportion of Late Woodland (Woodstock and Hiwassee Island) ceramic types (80%) but very few Etowah sherds (20%) (Cable 2000). Three pit features (Features 1519, 1520, and 1532) were excavated and exhibited a more substantial Late Woodland composition than the palisade line; only 5% of the sample was comprised by Etowah ceramics. The ceramic data suggest that 9TO48 was abandoned by the beginning of the Etowah phase (Cable 2000).

Soil samples were taken from excavated features (dish- and bell-shaped pits) and processed by flotation (Raymer and Bonhage-Freund 2000). Unfortunately, the collections of pottery from these excavations are small and mixed, with Late Woodland, Woodstock, and Etowah sherds included in the same samples. A definitive identification of any of these features with a specific component is problematic at best. Therefore the Brasstown Valley samples are discussed in terms of archaeobotanical remains in Pre-Etowah versus Late Etowah contexts (Table 5.5).

Table 5.5 Ubiquity of plant food remains by phase for 9TO48 and 9TO49.

	Pre-Etowah	**Late Etowah**[#]
Hickory or Walnut	100%	92%
Acorn	43%	15%
Cucurbit Rind	--	8%
Goosefoot	14%	8%
Maygrass	14%	--
Maize cupule	43%	46%
Maize kernel	14%	54%

[#] Analysis of Etowah phase features from 9TO49 [Locus B in Brasstown Cluster].

Comparison of the ubiquity of edible remains (Table 5.5) reveals that nutshell comprises the most common subsistence remain in both Pre-Etowah and Late Etowah samples. Native cultigens are present in minimal amounts for both phases. Maize remains are present in almost half of the Pre-Etowah features sampled, signifying the beginning of maize production. The low occurrence of native cultigens is consistent with patterns identified by Scarry (2003; 1993) in the piedmont and coastal plain of Georgia, Alabama, and eastern Mississippi, where native seeds never constitute a large percentage of the diet. The decline in nuts and increase in maize (54%) in Late Etowah features indicates the intensification of maize cultivation and dominance.

Archaeobotanical remains from the Emergent Mississippian Martin Farm phase in eastern Tennessee reveal the same pattern of food production. Hickory nutshell represented the most common edible remain, constituting 15 to 30% of recovered remains from most features sampled. Acorn was present in small amounts (2% of contexts). While maize remains were recovered from most contexts (72%), native cultigens were present only in small amounts (2%) (Schroedl et al.1985:424). Few differences in archaeobotanical remains were noted in the succeeding Early Mississippian Hiwassee Island phase, indicating that both groups were intensively cultivating maize and exploiting a similar complement of wild resources.

5.4 New Subsistence Analysis

Although recent subsistence data indicate that the intensive cultivation of maize began during the Woodstock phase, more botanical data are needed to assess its relative importance to the Woodstock diet. The assignment of features to the Woodstock phase is based on analysis of the ceramics recovered from the features (for a full discussion of the Woodstock ceramic assemblage see Chapter 4). Table 5.6 describes Woodstock features not presented in Table 5.1.

Table 5.6 Woodstock features containing archaeobotanical material at 9CK9.*

Site	Feature	Description	Diagnostic Ceramics	Count
9CK9	**6962**	*Oval burial pit*	Woodstock Complicated Stamped	1
	6967	*Circular burial pit*	Woodstock Complicated Stamped	1
	7505	*Circular refuse pit*	Woodstock Complicated Stamped	4
9MU103	**83**	*Pit*	Woodstock Complicated Stamped	62
	122	*Pit*	Woodstock Complicated Stamped Etowah Complicated Stamped	74 1
	133	*Large pit*	Woodstock Complicated Stamped Woodstock Incised Etowah Complicated Stamped	195 1 3
	N450 E70	*Midden*	Woodstock Complicated Stamped Woodstock Check Stamped Etowah Complicated Stamped	9 2 1

* See Table 5.1 for descriptions of 9CK9 Features 6116, 6119, 6227, 6330, 7010, 7902, 8052, 9208, 9635, and 9645.

To increase the botanical database from which to assess Woodstock subsistence, I contracted the services of Amanda Tickner, an archaeobotanist studying under C. M. Scarry at the University of North Carolina, Chapel Hill. Tickner examined previously unanalyzed and analyzed flotation samples from Woodstock features at 9MU103 and 9CK9 (Table 5.7). As discussed in the preceding section, two features (Features 6962 and 6967) at 9CK9 previously identified as Swift Creek should be assigned to the Woodstock phase based on their ceramic assemblages. These features are presented as Woodstock features in Table 5.7. I requested that Tickner reassess this material in accordance with the new Woodstock cultural designation.

Table 5.7 Woodstock features from which flotation samples were collected.

Site	Provenience	Description
9MU103	Feature 83*	Small, shallow circular refuse-filled pit.
	Feature 122*	Large, oval refuse-filled pit.
	Feature 133	Large, carefully constructed, circular refuse-filled pit.
	N450 E70*	10’ x 10’ block excavation in Woodstock midden.
9CK9	Feature 6116	Oval pit identified as possible burial based on form and fill characteristics.
	Feature 6119#	Roughly circular burial pit tentatively identified as Swift Creek.
	Feature 6227	Large, oval pit immediately inside palisade line. Possible borrow pit for obtaining clay for palisade construction.
	Feature 6330	Small, circular refuse-filled pit.
	Feature 6962	Oval, midden-filled pit. Fragmentary human remains were either disturbed by or redeposited within pit.
	Feature 6967	Roughly circular pit identified as possible burial on the presence of a groundstone pendant.
	Feature 7010#	Irregularly shaped, roughly oval refuse-filled pit.
	Feature 7505*	Small, circular refuse-filled pit remnant located a short distance inside palisade line.
	Feature 7902	Large, roughly oval refuse-filled pit immediately inside palisade line. Possible borrow pit for obtaining clay for palisade construction. Burning may indicate secondary function.
	Feature 8052	Shallow, nearly circular refuse-filled pit remnant located a short distance inside palisade line.
	Feature 9208	Nearly-circular refuse-filled pit immediately inside palisade line. Possible borrow pit for obtaining clay for palisade construction.
	Feature 9635	Irregularly shaped, shallow trench immediately inside and parallel to palisade line. Possible borrow pit for obtaining clay for palisade construction.
	Feature 9645	Irregularly shaped, shallow trench immediately inside and parallel to palisade line. Possible borrow pit for obtaining clay for palisade construction.

* Contexts not previously subjected to archaeobotanical analysis.
# Features previously identified as Swift Creek.

The goal of this analysis was to determine the presence and ubiquity of native and non-native cultigens to assess the subsistence changes that were occurring in north Georgia, particularly the intensification native seed and maize cultivation. Macroplant assemblages are presented for Swift Creek features at 9CK9 (Table 5.8), Woodstock features at 9CK9 (Table 5.9), and Woodstock features at 9MU103 (Table 5.10).

Tickner's discussion of standard archaeobotanical analysis methods, full report, and summary tables are included as Appendix B.

Table 5.8 Macroplant assemblage for Swift Creek features at 9CK9.

Feature Liters floated	**6119** 79		**7010** 6	
	No.	Wt.[a]	No.	Wt.[a]
NUTSHELL				
Carya sp. (hickory)	9	<0.1	6	<0.1
Castanea dentata (chestnut)				
Juglans nigra (walnut)			2	<0.1
Quercus sp. (acorn)				
meat				
shell	12	<0.1	2	<0.1
SEEDS, FRUITS, MAIZE				
Passiflora incarnata (maypop)			1F	<0.1
Passiflora lutea				
Phalaris caroliniana (maygrass) *			2W	<0.1

[*] Denotes native cultigens used for comparative purposes in Table 5.11.
[a] Weight is measured in grams (g).

Table 5.9 Macroplant assemblage for Woodstock features from 9CK9.

Feature	**6116**		**6227**		**6330**		**6962**		**6967**		**7505**		**7902**	
Liters floated	11		13		10		53		41		--		21	
	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]
NUTSHELL														
Carya sp. (hickory)	2	0.02	1	<0.1	14	0.15	100+	2.4	27	0.3	5	0.04	2	0.05
Castanea dentata (chestnut)														
Juglans nigra (walnut)							6	<0.1	6	0.1				
Quercus sp. (acorn)														
meat			5	<0.1										
shell	19	0.05			2	0.01	61	<0.1	1	0.01				
SEEDS, FRUITS, MAIZE														
Chenopodium (chenopod)[*]											1	<0.1		
Phalaris caroliniana (maygrass)[*]					1W	<0.1			10W	<0.1				
Phaseolus (bean)														
Polymnia canadensis (bearsfoot)			26	0.1					1W	<0.1				
Vitis sp. (grape)					1F	<0.1	1F	<0.1						
Zea mays (maize)														
cupule			5	0.02	3W 7F	<0.1			2F	<0.1				
kernel							1F	0.02	2F	<0.1				
UID (grass or little barley)[*]														

[*] Denotes native cultigens used for comparative purposes in Table 5.11

.[a] Weight is measured in grams (g).

Table 5.9 Continued. Macroplant assemblage for Woodstock features from 9CK9.

Feature	**8052**		**9208**		**9635**		**9645**	
Liters floated	15		10		229		36	
	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]
NUTSHELL								
Carya sp. (hickory)	8	0.02	9	0.1	171	4.42	30	0.3
Castanea dentata (chestnut)								
Juglans nigra (walnut)					3	<0.1		
Quercus sp. (acorn)								
meat			1	<0.1	1	0.03	40	<0.1
shell	3	0.01	2	<0.1	135	0.78	102	2.2
SEEDS, FRUITS, MAIZE								
Chenopodium (chenopod)*								
Helianthus annus (sunflower)*					1	0.02		
Passiflora incarnata (maypop)					3W 9F	0.05	9F	0.07
Phalaris caroliniana (maygrass)*					134	0.08	8W	<0.1
Phaseolus (bean)								
Polygonum sp. (knotweed)	2F	<0.1						
Polymnia canadensis (bearsfoot)	1W 6F	<0.1						
Sambucus canadensis (elderberry)							1W	<0.1
Vitis sp. (grape)					3W 9F	0.03	2F	<0.1
Zea mays (maize)								
cupule			1	0.01	6W 8F	0.04	1F	<0.1
kernel	3F	<0.1			7W 16F	0.28		
UID (grass or little barley)*								

* Denotes native cultigens used for comparative purposes in Table 5.11.
[a] Weight is measured in grams (g).

Table 5.10 Macroplant assemblage for Woodstock features from 9MU103.

Feature	**83**		**122**		**133**		**Midden**[b]	
Liters floated	Unknown		Unknown		Unknown		Unknown	
	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]	No.	Wt.[a]
NUTSHELL								
Carya sp. (hickory)	23	0.41	4	0.08	259	8.67		
Castanea dentata (chestnut)								
Juglans nigra (walnut)	1135	91.61			7	0.2		
Julgandaceae sp. (Walnut or Hickory)					32	0.36		
Quercus sp. (acorn)	121	0.66						
SEEDS, FRUITS, MAIZE								
Chenopodium (chenopod)*								
Vitis sp. (grape)	1W	0.01			1W 3F	0.02		
Zea mays (maize)								
cupule	128	1.19			43	0.3		
kernel	6	0.09			5	0.09		
Legume type (poss. Hogpea)					10	0.23		
UID (grass or little barley)*					1	0.01		

* Denotes native cultigens used for comparative purposes in Table 5.11.
[a] Weight is measured in grams (g).
[b] No plant remains were present in this sample. The entire sample represented wood remains.

5.5 Interpretation of New Woodstock Subsistence Data

According to Tickner (Appendix B:229), the small size of the samples from 9CK9 (n=13) and 9MU103 (n=4) makes “discussing the nature of nuts versus cultivated food sources” and the execution of statistical analyses difficult. Following C. M. Scarry’s (2003) methodology for describing “large scale patterns of plant use in the southeastern interior over time” (Appendix B:230), Tickner compared counts and percentages to provide insight into the subsistence strategies employed by Woodstock groups.

The archaeobotanical results (Table 5.11) show that nutshell is the most common subsistence remain in all of the samples, constituting 94% of the Swift Creek and 77.5%

of the Woodstock samples from Hickory Log (9CK9). Nutshell constitutes 89.5% of the Woodstock samples from Potts' Tract (9MU103). A high occurrence (82% of the total edible remains) of walnut family shells, including hickory, at 9MU103 does not correspond to the general Emergent Mississippian trend of decreasing nut use with increasing maize cultivation (Scarry 2003). As the walnut remains were recovered from a single feature (Feature 83), Tickner asserts that the remains denote a processing event and thus skew their representation in the total plant assemblage. Native cultigens are barely present. Maize constitutes 11% of the total edible remains and is present in 50% of the Woodstock features. The general pattern of botanical remains is consistent with the intensification of maize cultivation.

Table 5.11 Ubiquity of plant food remains for 9CK9 and 9MU103.

	9CK9: Swift Creek	**9CK9: Woodstock**	**9MU103: Woodstock**
Hickory	15	369	286
*% of hickory in total**	*46%*	*38%*	*16.5%*
Walnut	2	15	1142
*% of walnut in total**	*6%*	*1.5%*	*66%*
Acorn	14	372	121
*% of acorn in total**	*42%*	*38%*	*7%*
Native Cultigens	2	155	1
*% of native cultigens in total**	*6%*	*16%*	*<1%*
Maize	0	62	182
*% of maize in total**	*0%*	*6.5%*	*11%*
% of maize in total cultigens	*0%*	*28%*	*99%*

*total denotes total edible remains

The larger sample size for 9CK9 allows for the comparison of the nature of nuts versus cultivated foods between phases. The assemblage is consistent with the trend of declining nut use and increased presence of maize representative of the emergent

Mississippian period (Table 5.11). More interesting are the patterns that are revealed when the Swift Creek and Woodstock phase assemblages are compared. Hickory nuts account for 46% of the total edible remains in the Swift Creek phase but decrease to 38% in the Woodstock phase. The contribution of acorns to the assemblage declines from 42% to 38%. Native cultigens make up 16% of the edible remains, which, according to Tickner, contrasts with the patterns expected for the piedmont and coastal plain of Georgia, Alabama, and eastern Mississippi in which native cultigens generally constitute less than 10% of remains (Scarry 2003). The high levels of native cultigens are more representative of the patterns seen in the American Bottom. Absent from the Swift Creek samples, maize constitutes 6.5% of the Woodstock edible remains and is present in 82% of the Woodstock features sampled.

In summary, Tickner states that the dramatic increase in the presence of maize and the concurrent decline in remains from the hickory/walnut family during the Woodstock phase is consistent with the patterns of subsistence change toward the intensive cultivation of maize that are seen in Emergent Mississippian phases across the Southeast (Scarry 2003). The shift in subsistence toward the intensification of maize production indicates the first stage in the development of political complexity in north Georgia began in the Woodstock phase.

CHAPTER 6

VESSEL FORM ANALYSIS

6.1 Vessel Forms and Subsistence Practices

Analysis of vessel forms is important because vessel forms relate to diet and food preparation (Braun 1983; Hally 1986; Hastorf and Johannessen 1994; Johannessen 1993b; Rice 1987; M. Smith 1985). Previous research has addressed various aspects of the functional nature of pottery. Methods for estimating vessel shape and capacity from sherds have been refined (Henrickson and McDonald 1983; M. Smith 1985), allowing researchers to assess the nature of variability within vessel assemblages (Hally 1986). Research has explored the effects of physical and morphological properties on vessel performance and the relation between vessel morphology and vessel function (Hally 1986; Henrickson and McDonald 1983; M. Smith 1985). These approaches, in conjunction with ethnographic comparisons, enable the determination of vessel function for the majority of vessel forms that constitute a community's vessel inventory (Hally 1986; Henrickson and McDonald 1983; M. Smith 1985).

Ethnographic ceramic data concerning the use of morphologically different vessels can be used to derive correlations between function and form. Ethnographic comparison reveals that vessels are designed within size and form limits to perform specific functions and that generic morphological parameters relating to "vessel stability, durability, and functional efficiency and convenience" are cross-cultural (Henrickson and McDonald 1983:640). Although a limited number of ethnographic ceramic studies have been conducted, these studies address groups with diverse economic and sociopolitical systems (tribal and peasant societies) across a number of geographical settings, including the American Southwest, Peru, Africa and Nepal (Hally 1983; Henrickson and McDonald 1983). Some researchers have focused on ceramic technology and manufacture (see Foster 1948; Watson 1955) while others have examined patterns of learning within communities of potters (Stanislawski and Stanislawski 1978). Numerous studies have addressed function, variously investigating physical features of cooking pots (Linton 1944), the use life of pottery vessels (David 1972; DeBoer and Lathrap 1979; Foster 1960), and the relationship between vessel form and function (David 1972; DeBoer and Lathrap 1979).

Experimental archaeological studies have also expanded our understanding of how physical and morphological properties relate to various performance characteristics, e.g. the ability to withstand thermal stress or to remain upright without external supports (Braun 1983; Bronitsky and Hamer 1986; Ericson et al. 1972). These properties subsequently determine a vessel's suitability for a particular task, such as cooking food, boiling or storing drinking water, and storing dry foods or animal fats (Hally 1986). Experimental archaeological studies have evaluated vessel breakage rates and discard behavior (DeBoer and Lathrap 1979; Foster 1960) and have provided techniques for estimating vessel shape and capacity from sherds (Ericson and DeAtley 1976; Fitting and Halsey 1966; M. Smith 1980; Whallon 1969).

A growing interest in relating vessel forms to their intended functions in ancient communities has prompted the examination of archaeological assemblages. However, few attempts have been made to determine the function of all of the vessel forms represented by the material remains (Hally 1983, 1986; Henrickson and McDonald 1983; Lishka 1978). Hally's (1983, 1986) assessment of the differing functions of vessels within prehistoric ceramic assemblages from northern Georgia is informative. In the context of understanding ceramic pots as tools that were used as containers (Braun 1983), Hally has argued that prehistoric Southeastern potters were aware of the effects of physical and morphological properties on vessel performance. In consideration of these properties, Southeastern potters manufactured several types of vessels, each of which possessed different performance properties and were subsequently limited to specific functions such as boiling seeds, parching corn, or storing liquids (1986).

Therefore, changes in vessel forms and vessel assemblages (i.e. the range of distinct vessel forms that are manufactured and used by members of a community to meet their daily household needs) (Hally 1983) reflect changes in practices of food preparation and storage as new foodstuffs require new preparation and serving techniques (Braun 1983; Hally 1986; Hastorf and Johannessen 1994; Henrickson and McDonald 1983; Rice 1987; M. Smith 1985). The impact of the intensification of maize production in the Emergent Mississippian period in the American Bottom resulted in modifications in the ceramic assemblages (Kelly 2004) that included "shifts in morphology, assemblage composition, and size" (Kelly 1992:180)

In addition to ceramic vessel changes, the presence of hoes made from a variety of materials (stone, bone, shell) is often regarded as evidence for maize cultivation, as maize fields must be weeded in contrast to the broad-cast sewn fields of native cultigens (Smith and Cowan 2003). Stable carbon isotope analysis of human bone collagen assesses the consumption of maize by prehistoric farmers. Indeed, van der Merwe (1980) research in the midwestern United States has demonstrated that the relative proportion of carbon from C_4 plants (i.e. maize) increased from 0% in analyzed Archaic skeletal populations to more than 70% in Mississippian skeletal populations. The currently available sample of excavated Woodstock stone tools and skeletal remains, however, are inadequate for any meaningful determinations. For example, only one possible chipped slate hoe was recovered from the Hickory Log site (9CK9) (Webb 2001). Thus, ceramic vessel data were the most accessible and appropriate material culture indicator of subsistence change for my research.

6.2 The Late Woodland Vessel Assemblage

The Late Woodland period in north Georgia is represented by the Swift Creek and Napier phases. Swift Creek ceramics are characterized by grit tempering and a wide variety of complicated stamped designs, including both curvilinear and rectilinear motifs and combinations of both elements (see Figure 4.4). Napier ceramics are characterized by grit tempering and the nearly exclusive use of rectilinear designs; circles or combined rectilinear and curvilinear designs are rare (see Figure 4.2). The Hamilton phase denotes the terminal Late Woodland period in the Chickamauga Basin in eastern Tennessee. Hamilton ceramics are characterized by grit and limestone tempering and a wide variety of surface treatments, including fabric marking, cord marking, brushing, and complicated stamped designs.

Two terminal Late Woodland populations are distinguished in northern Alabama. In the Pickwick and Wheeler Basins, located west of Green Mountain (a ridge that runs perpendicular to the Tennessee River) McKelvey phase ceramics are characterized by clay-tempering, which suggests a lower Mississippi Valley influence (Walthall 1980). The McKelvey vessel assemblage apparently consists of a single vessel form, a jar with a rounded bottom and "slightly flaring mouth" (Walthall 1980:137). The McKelvey phase ceramics indicate diffusion of traits from populations in the Tombigbee Basin to the west. Thus, while McKelvey phase ceramics are important to understanding the Late Woodland period in general, the data from the Pickwick Basin are not applicable for the discussion of Late Woodland vessel forms for north Georgia.

Conversely, east of Green Mountain in the Guntersville Basin, the terminal Late Woodland is represented by the Flint River phase and the production of limestone-tempered ceramics (Walthall 1980). Flint River ceramics are characterized by cord marking and brushing similar to contemporaneous limestone-tempered Hamilton ceramics. The frequency of motifs is reversed, as Flint River surface treatments are dominated by brushing but exhibit very little cord-marking (Walthall 1980).

Based on very few whole or reconstructed vessels, the Late Woodland vessel assemblage, according to Broyles (1967) and Wauchope (1966), is comprised of a jar with a short neck, slight shoulder, and a generally rounded to conical base; simple bowls are also present in limited amounts. According to Lewis and Kneberg (1995), the Hamilton vessel assemblage, like the Swift Creek and Napier assemblages, is comprised of a small number of vessel forms: a jar with a short neck, slight shoulder, and a generally rounded to conical base; a kettle, in which the body merges with the rim; and a few bowls (Figure 6.1). Walthall (1980) describes Flint River vessels as "round-bottom" jars (see Figure 6.1, Guntersville Basin).

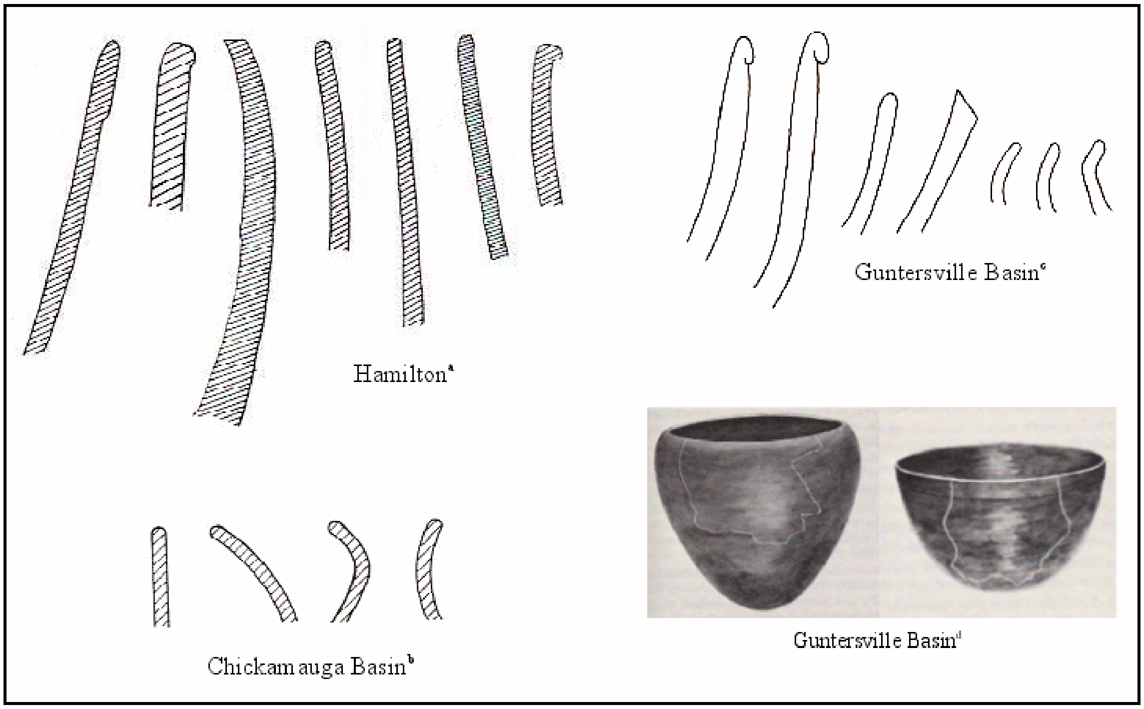

Figure 6.1 Late Woodland vessel assemblage (adapted from [a]Lewis and Kneberg 1946:Plates 46-47; [b]Lewis and Kneberg 1995:84 [Figure 5.1]; [c]Heimlich 1952:60 [Plate 2B]; [d]Walthall 1980:133,170.)

The profiles depicted in Figure 6.1 are typical of the Late Woodland vessel forms described by the authors in the preceding paragraph. Looking at these profiles, some general features can be recognized, even though the profiles are drawn from several cultures over a large area. There is limited variation in form, little shoulder development, and few out-flaring rims. The small number of profiles and the absence of shoulders on the majority of rim sherds hinder the determination of size differences. However, considering the sample available and the discussion of Late Woodland vessel forms as provided by the above authors, the Late Woodland vessel assemblage appears to consist basically of a single jar form in a single size.

6.3 The Mississippian Vessel Assemblage

6.3a Late Mississippian Vessel Assemblage

The Mississippian period saw the introduction of new vessel forms and the manufacture of existing vessel forms in varying sizes. These changes signify the need for new food preparation techniques related to the consumption and cultivation of maize. Discussion of Hally's (1986) analysis of the Late Mississippian Barnett Phase vessel assemblage is appropriate to understand how changes in vessel assemblages can inform us of the changes in subsistence practices that occurred within local groups in the north Georgia region.

Reconstruction of the Late Mississippian vessel assemblage is based on Hally's (1983) application of ethnographic information to the analysis of whole and partial vessels recovered through excavation of the Barnett phase (A.D. 1550 to A.D. 1700) component at the Little Egypt (9MU102) and King (9FI5) sites in north Georgia. Barnett phase ceramics are grit-tempered and exhibit Lamar Complicated Stamped designs, which were often poorly executed and heavily overstamped (Hally and Langford 1988).

Focusing on identifying vessel shape and size classes, Hally recorded vessel wall profiles and orifice diameter. The orifice refers to the point in the rim/neck area at which the interior vessel diameter is the smallest; orifice diameters were measured with a sherd board and plotted by vessel shape class in frequency histograms (Hally 1983, 1986). Analysis resulted in the identification of eight distinct vessel forms (Figure 6.2) and the discovery of a strong correlation between orifice diameter and vessel size (measured by vessel height or maximum vessel diameter) in at least five shape classes (Hally 1983).

Morphological Vessel Types

Three forms of bowls (Figure 6.2) were identified: flaring rim, rounded, and carinated. Flaring rim bowls are small, flat-bottomed vessels with rounded sides and outflaring rims and occur in only one size. Rounded bowls display flat and rounded bottoms, rounded sides, and vertical or incurving rims and occur in two size classes. Carinated bowls exhibit flat bases, steeply sloping walls, and insloping rims and exhibit two size classes (Hally 1983; 1986).

Three jar forms (Figure 6.2) were identified: pinched rim, Mississippian, and carinated. Pinched rim jars have a round to spherical body with a rounded base, constricted neck, and outflaring rim and occur in at least three sizes. The Mississippian jar has a round to spherical body with a rounded base and a constricted neck but has straight or insloping rims and handles; Mississippian jars occur in two sizes (Hally 1983; 1986). Although only one whole vessel was present in the study collection, based on comparison with a contemporaneous collection from the Tugalo site in northeast Georgia, the carinated jar has a rounded body, a flat base, and a shoulder marked by a distinct break in the profile "where the inward sloping upper wall meets the rounded lower wall" (Hally 1986:277). Carinated jars may have been made in only one size.

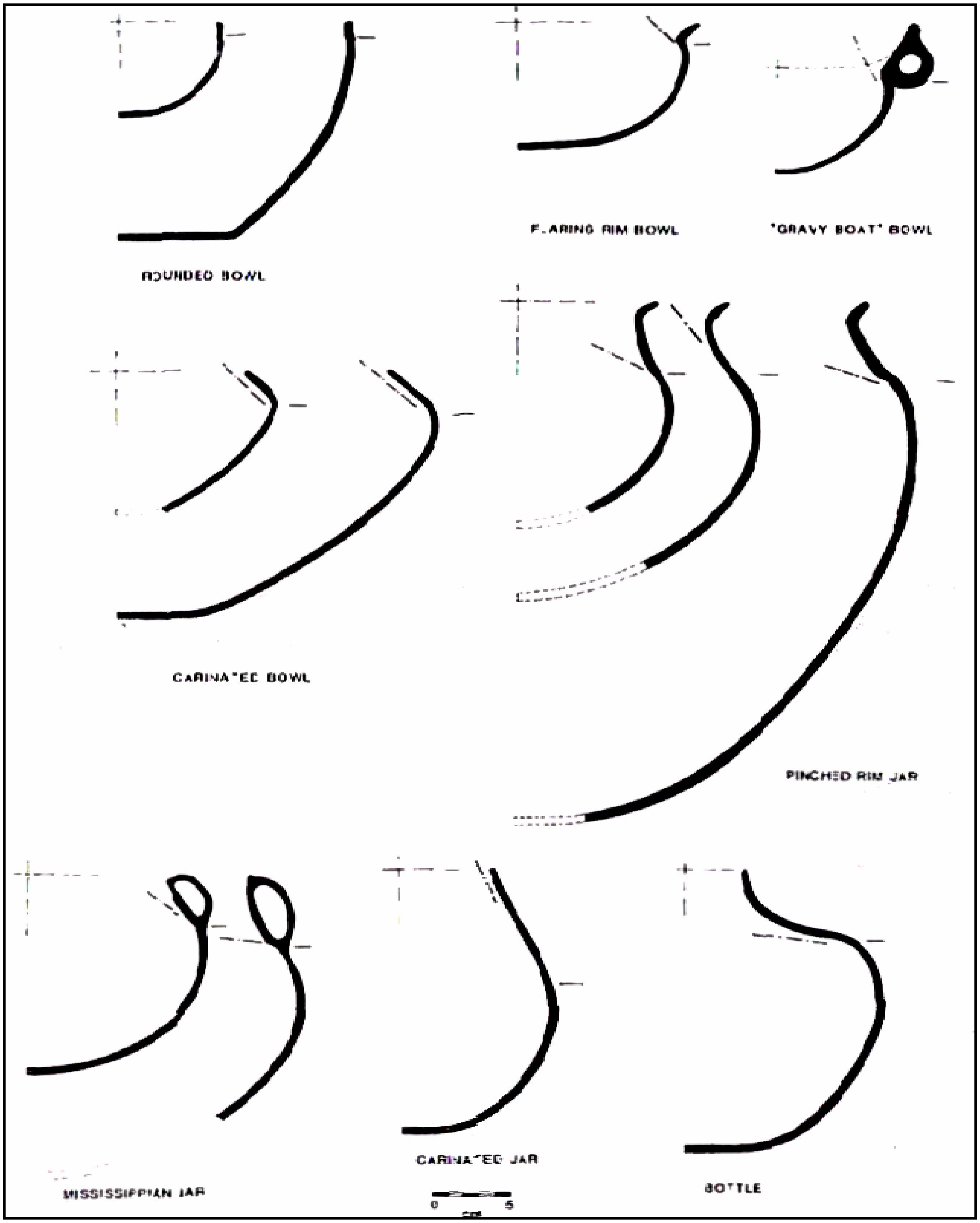

Figure 6.2 Barnett phase vessel shapes (Hally 1986:Figure 2).

The final two vessel forms include a bottle and a "gravy boat" (Figure 6.2) (Hally 1983). The bottle form has a round to spherical body, flat base, insloping or vertical rims, and a narrow orifice. Gravy boats are small, oval bowls with flat bases and rounded sides; a lip with a loop handle extends upward from the exterior of the rim on each end of the vessel (Hally 1983). Neither the bottle form nor the gravy boat was represented by enough whole or partial vessels to confidently determine the existence of different size classes.

In summary, the Barnett phase vessel assemblage consisted of diverse vessel forms that were made in various sizes. Two jar forms (pinched rim and Mississippian) exhibit constricted necks above discernible shoulders. Three distinctly different bowl forms were identified, displaying a range of rim forms (out-flaring to insloping) and rounded to steeply sloping sides. Three unique forms were identified, including a bottle with a narrow orifice, a small "gravy boat" with distinctive loop handles, and a carinated jar that features a distinct break in the vessel profile at the shoulder.

Hally similarly reconstructed the vessel assemblages for the Beaverdam Creek site (9EB85) located in north Georgia and the Joe Bell (9MGG28) and Lindsey (9MG231) sites located in central Georgia. Although the Beaverdam phase preceded the Barnett phase by 200 years, comparison of these Late Mississippian assemblages reveals considerable similarity of vessel forms (Figure 6.3). The same three bowl forms (flaring-rim, rounded, and carinated) and the bottle form are evident. Two other jar forms (short neck and tall neck) are comparable to the Barnett phase Mississippian and pinched rim jars, respectively.

The production of at least six different forms, some of which were made in different size classes reflects the diversity of vessel forms characteristic of the Mississippian period. Similarity of vessel forms is expected, as these Late Mississippian groups were farmers that engaged in a single food use pattern (hominy-beans-pottage), i.e. the vessel assemblages were produced to meet the same food preparation and consumption needs (Hally 1983; 1986).

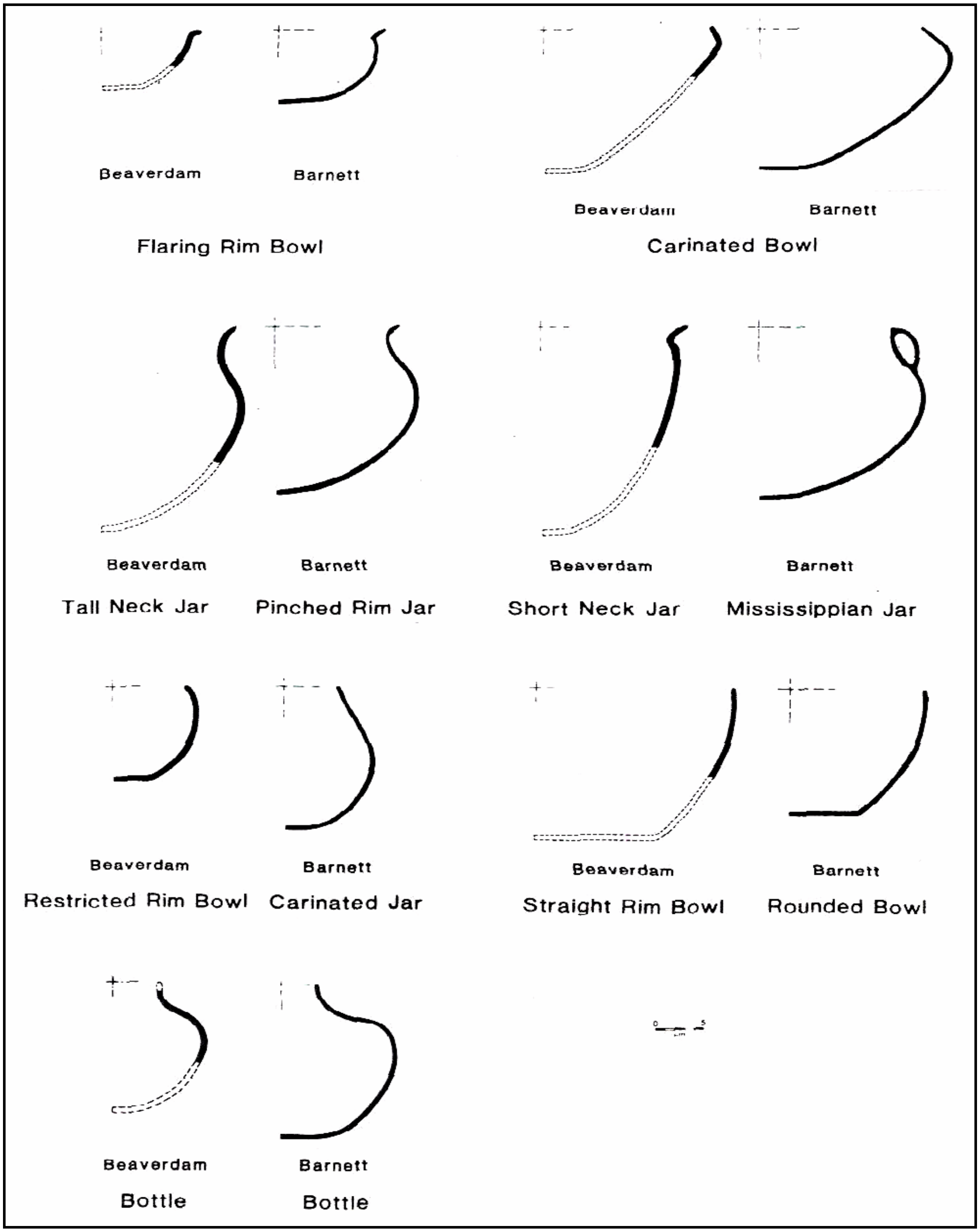

Figure 6.3 Late Mississippian vessel shapes (Hally 1984:Figure 7).

The consideration of ethnographic analogies in conjunction with the evaluation of morphological and physical properties (Table 6.1) enabled Hally to reconstruct the functions of the Barnett vessel forms (see Hally 1986 for a full discussion of this process).

Table 6.1 Morphological and physical properties of vessels (adapted from Hally 1986).

Maximum vessel diameter	Maximum vessel height	Ratio of height to diameter
Shape of base	Vessel wall curvature	Orifice diameter
Orifice constriction	Angle of orifice constriction	Center of gravity
Rim orientation	Rim profile	Handles
Height of shoulder (maximum vessel diameter) above base	Ratio of basal diameter to vessel diameter	Ratio of orifice area to vessel capacity
Temper material	Surface finish	Sooting
Surface pitting	Surface decoration	Vessel type frequency

Mechanical Performance Characteristics

Vessel stability relates to the ability of a vessel to stand upright on a flat surface. It is approximated by the ratio of the diameter of the base to the vessel's maximum diameter and the ratio of the vessel's height to its maximum diameter. *Vessel suspension* reflects the use of handles to encompass a cord (e.g. rope) that suspends the vessel a short distance above a heat source. *Space utilization* is an important consideration for long-term storage vessels; a large capacity but a minimal occupation of horizontal space were desired for this use. It is calculated as the ratio of a vessel's maximum height to its maximum diameter. *Effective vessel capacity* refers to the maximum volume of material that is a vessel can effectively hold and is affected by the need to prevent contents from spilling during transport or manipulation. *Orifice closure* relates to the ability of a cover to be placed around a vessel's rim; a smaller vessel orifice is easier to close with a cover.

Manipulation of Vessel Contents is conditioned by three factors: the size of the vessel's orifice, the degree of orifice constriction, and the height of the vessel. A shallow vessel with a large orifice but minimal constriction allows for easy content manipulation by a ladle or hand. A tall vessel with a small orifice but substantial orifice constriction makes content manipulation difficult. *Removal of vessel contents* denotes the means of content removal: lift out or pour. A small orifice hinders the lifting of material but provides better control for pouring. *Vessel content spilling* is minimized by constricting the vessel orifice; the potential for spilling is reduced with increasing orifice constriction.

Heat absorption efficiency is affected by base shape and the amount of a vessel's surface that is exposed to a heat source. A rounded base, large vessel diameter, and considerable distance between the base and the shoulder improve the efficiency of a vessel to absorb heat. The rate at which a vessel's contents lose heat (*vessel content loss*) and the rate at which liquid contents evaporate (*evaporation of vessel contents*) can be reduced through a smaller orifice or through covering the orifice. The ability of a vessel to withstand repeated heating and cooling (*thermal shock resistance*) is affected by vessel wall curvature; vessels with smooth, rounded profiles are less likely to crack during cycles of heating (expansion) and cooling (contraction).

The determination of Barnett phase vessel function is important in understanding how the different vessel forms in a varied vessel assemblage were used. In contrast to the Late Woodland vessel assemblage, which consisted of a single jar, the Late Mississippian vessel assemblage consisted of a number of distinct vessel shapes in multiple sizes. The ceramic evidence (Hally 1986) based on the determination of eight vessel shapes and multiple vessel sizes for several vessel shape classes indicates that the Barnett vessel assemblage consisted of at least two jar forms that exhibit more marked neck constriction and a more developed shoulder as well as multiple bowl forms. The production of new forms during the Mississippian period is significant as the introduction of different foodstuffs, most notably maize and later beans, required new preparation, cooking, and storage techniques that required *new* vessel forms (diversification) as well as *more* vessel forms (elaboration in size classes).

6.3b Early Mississippian Vessel Assemblage

The Early Mississippian period in north Georgia is represented by the Etowah phase. Wauchope (1966) attempted to divide the phase into four subdivisions (Etowah I-IV) based upon stylistic changes. The insufficient nature of the data – no Etowah I sites, the restriction of Etowah IV sites to only one river valley (Etowah River valley) – and the transitional position of the earliest and latest manifestations of the Etowah phase, prompted Hally and Rudolph to discard Wauchope's Etowah I and Etowah IV designations (1986). I follow the convention of dividing the Etowah phase motifs into simple Early and Late Etowah subgroups.

Early Etowah (A.D. 1000 to A.D. 1100) ceramics are characterized predominately by grit tempering and the use of ladder-base diamond and line-block motifs (see Figure 4.9) (Caldwell 1953; King 2001). However, shell-tempered Hiwassee Complicated Stamped, which exhibits Etowah stamping designs, also occurs (Hally and Langford 1988). Late Etowah (A.D. 1100 to A.D. 1200) sees the addition of a number of design elements, including two- and three-bar diamonds, crossbar diamonds, and the filfot cross; the ladder-base diamond decreases in frequency (Caldwell 1957; King 2001; Sears 1958).

Early Mississippian vessel forms in northern Georgia have not been formally characterized, but the Etowah vessel assemblage is assumed to possess a jar with a large orifice, short neck, slight shoulder, and a generally round to conical base. Bowls, cylindrical vases, and jars with round to spherical bodies, rounded bases, and constricted necks are also included (Sears 1958; Wauchope 1966). To reconstruct the Early Etowah vessel assemblage, I analyzed rim profiles and rim diameters of large jars and large jar fragments excavated from Saucer 3 at the Etowah type site (9BR1). Even though King's radiocarbon dating suggested a Late Etowah assignment, based on the analysis of stamped motifs, Saucer 3 is primarily Early Etowah (see Chapter 3, section *3.1 Etowah Mound Center* for a detailed discussion of the dating of Etowah's saucers).

I utilized orifice diameter because Hally's (1983, 1986) analysis of whole vessel dimensions for the Barnett phase assemblage demonstrated that orifice diameter, as opposed to maximum rim diameter, is strongly correlated with vessel size and thus important for determining different sizes within shape classes. I recorded vessel profiles by placing each rim on a flat surface and establishing its vertical orientation. I used a light source (e.g. slide projector) to cast the profile's shadow onto a wall behind the rim, and then I traced the projected profile onto a piece of paper taped to the wall. This method preserved profile orientation and size. After scanning each profile, I used Corel software to compare profile orientations by placing similar profiles next to each other to create vertical alignments of profiles in order of decreasing maximum rim measurement. The comparison of actual vessel profiles allowed me to compare shoulder development and orifice constriction for each vessel profile, enabling me to determine the different vessel forms discussed below.

Comparison of vessel profiles indicates that the Etowah vessel assemblage consists of at least two jar forms, which I have designated as a flaring rim jar (Figure 6.5) and a shouldered jar (Figure 6.6). A third jar form, which I have designated as the short neck jar (Figure 6.4), may exist, but this form was represented by only one vessel. The Early Etowah phase assemblage exhibits only two characteristics [two loop handles and one red-filmed hooded bottle] that suggest the external introduction of Mississippian traits. Succeeding phases see the addition of stereotypical Mississippian ceramic features, including decorative techniques such as incising (King 2001:45) and new vessel forms such as plates. However, shell tempering appears to decline (Hally and Langford 1988).

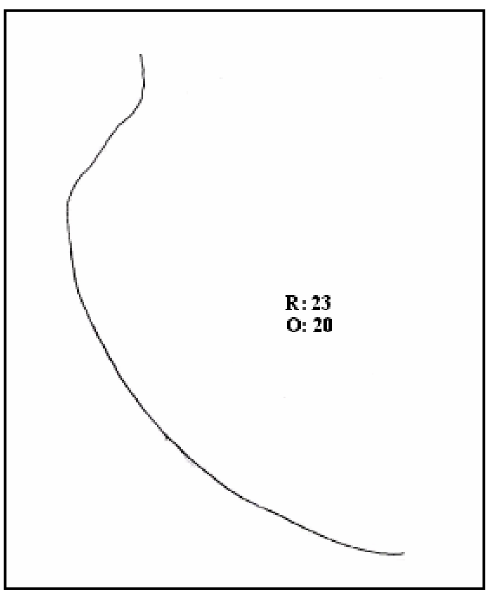

Figure 6.4 Rim profile for the Etowah short neck jar. Maximum rim (R) and maximum orifice (O) diameter (in cm) are noted.

The *flaring rim jar* has a round body, constricted neck, and out-flaring rim; it likely has a rounded base (Figure 6.5). The rim extends out as far as the shoulder, contributing to a more pronounced shoulder and flaring of the rim. Vessels are grit and limestone-tempered.

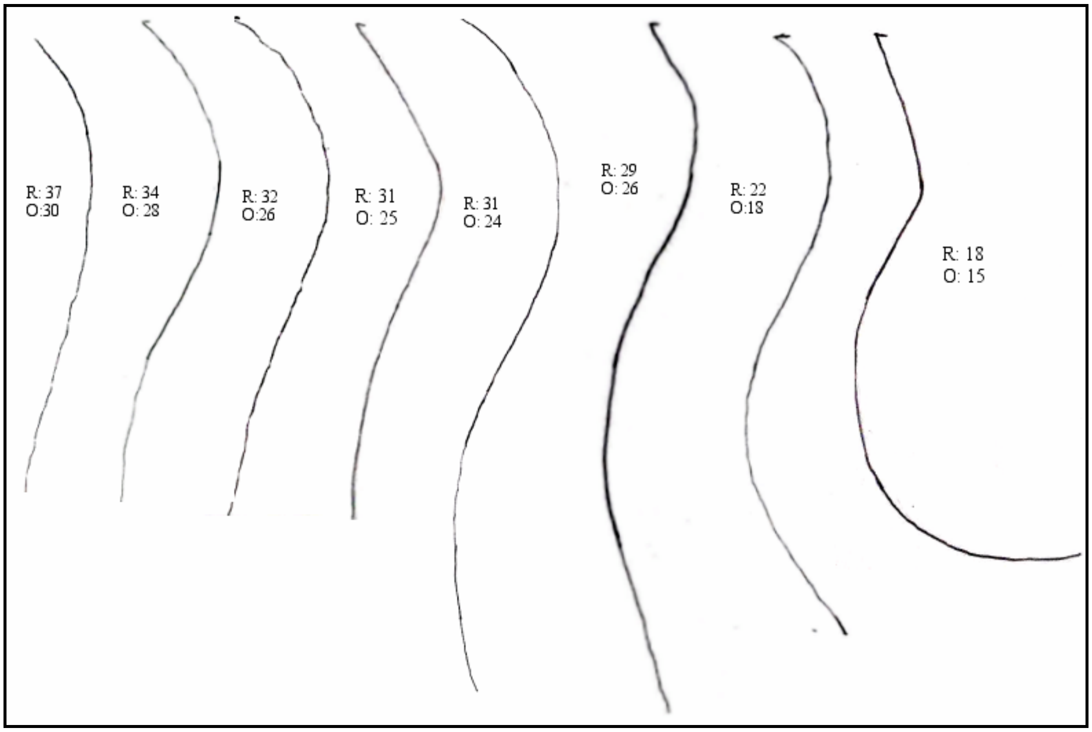

Figure 6.5 Rim profiles for the Etowah flaring rim jar. Maximum rim (R) and maximum orifice (O) diameters (in cm) are noted.

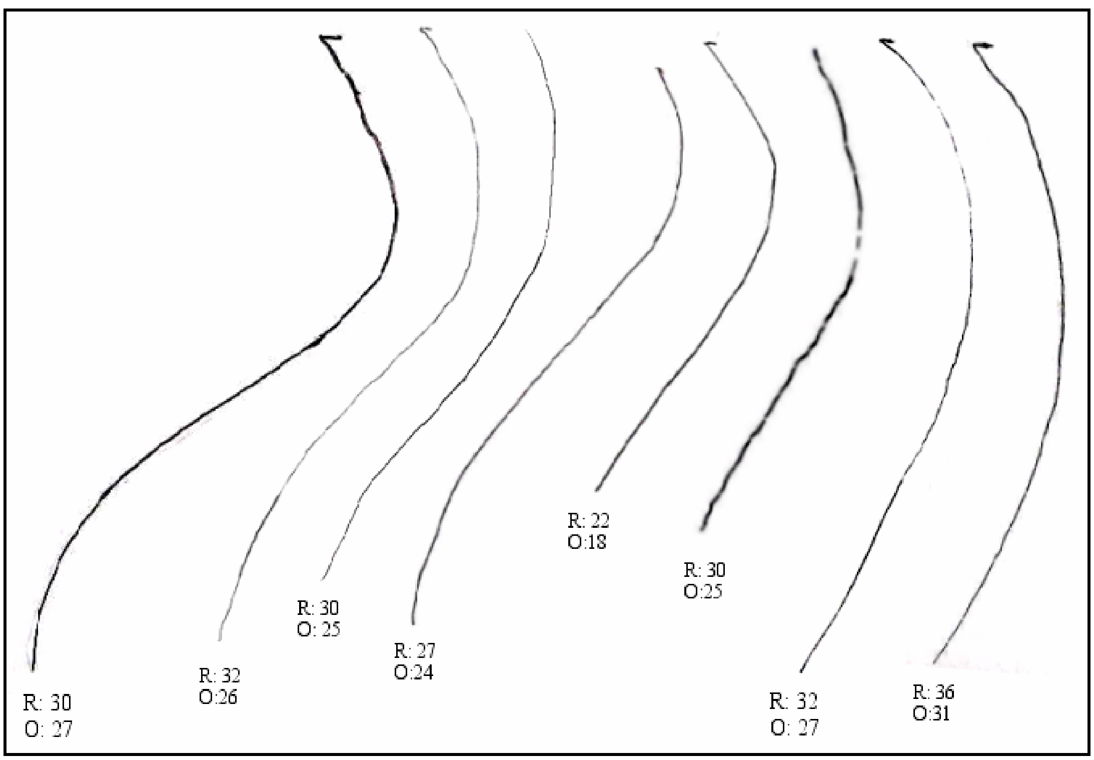

Figure 6.6 Rim profiles for the Etowah shouldered jar. Maximum rim (R) and maximum orifice (O) diameters (in cm) are noted.

The *shouldered jar* has a round to spherical body, small orifice, and short neck with a less pronounced shoulder (Figure 6.6). Paste is grit or limestone-tempered. Although limited in number (n=16), the small range of orifice diameters (15 cm to 30 cm and 18 cm to 31 cm) for the flaring rim and shouldered jars, respectively, suggests that both forms were manufactured in one size. This range reflects the size range observed for the Barnett phase flaring rim bowls (10 cm to 26 cm), which were manufactured in only one size (Hally 1986).

In sum, the Early Etowah vessel assemblage appears to consist of at least two jar forms, one of which (shouldered jar) exhibits the same well developed shoulder as seen in both of the Late Mississippian Beaverdam (tall neck jar) and Barnett (pinched rim jar) vessel assemblages. The Early Etowah phase differs from the Late Woodland vessel assemblage that consisted of a single jar form, demonstrating that the diversification of vessel forms extends from at least from A.D. 1000 (Early Etowah) through A.D. 1600 (Barnett).

Changes occurring in vessel assemblages in north Georgia are significant as they point to contact between the people of north Georgia and Mississippian populations to the west (Alabama) and north (Tennessee). The production of existing jar forms in multiple size categories and the addition of completely new jar and bowl forms during the Early Etowah phase are indicative of the implementation of new food preparation techniques as seen in the Late Mississippian period Barnett phase assemblage (Hally 1986). Evidence of relatively undamaged achenes in paleofeces from Kentucky suggests that Late Woodland cooking techniques showed little flexibility beyond boiling and parching (Smith and Cowan 2003). A more flexible food, maize could be prepared using numerous cooking techniques, such as parching, roasting, soaking, boiling, and drying (Smith and Cowan 2003). These new preparation techniques were the result of a subsistence shift toward intensive maize consumption and cultivation.

6.4 Defining the Woodstock Vessel Assemblage

Woodstock ceramics are grit tempered and exhibit the nearly exclusive use of concentric diamond, concentric oval, and line block complicated-stamped motifs. Wauchope (1966) described the Woodstock vessel assemblage as similar to the general Late Woodland vessel assemblage of jars with a short neck, slight shoulder, and a generally rounded to conical base and simple bowls. This assessment is not based on a formal study of Woodstock vessel forms. Cobb and Garrow (1996:30) describe the Woodstock vessel assemblage as a “continuation of a northern Georgia Woodland tradition of a restricted range of vessel morphologies” and suggest that “diversification in vessel forms” did not occur until after the Woodstock phase.

To formally reconstruct the Woodstock vessel assemblage, I analyzed rim profiles and rim diameters of large jars and large jar fragments in Woodstock ceramic collections from my study area (Table 6.2). To determine vessel shape classes and the distribution of sizes within each class, I recorded vessel profiles, maximum rim diameter, and orifice diameter for all measurable rim sherds. I measured orifice and maximum rim diameters on a sherd board.

Table 6.2 Collections used for reconstruction of Woodstock vessel assemblage.

SITE NUBMER	***SITE NAME***
9GW1146	Avery
9GW70	Rivermoore*
9MU 103	Potts' Tract
9LU7	Chestatee
9GO4	Thompson
9BR139	Stamp Creek
9CK26	Sixes Old Town
9CK23	Chambers
9CK85	Woodstock Fort
9CK103	

* The large, reconstructed Woodstock vessels discussed in the following section were recovered from Rivermoore.

Comparison of the profiles of these rims (n=80) resulted in the identification of five distinct vessel shapes. The use of profiles as an indicator of shape is based on the assumption of vessel symmetry, which states that vessels are "circular in sections parallel to the rim" (M. Smith 1985:281). Of this sample, 58 could be classified by vessel shape with some degree of confidence. I have designated these shapes as short neck jar, flaring rim jar, shouldered jar, and rounded bowl. On the basis of one distinctive rim sherd, I have tentatively identified a fifth form that I identify as a carinated bowl; however, more vessels or vessel fragments will need to be recovered to determine if this shape class truly exists in the Woodstock phase assemblage.

6.5 Vessel Forms

6.5a Short Neck Jar

Figure 6.7 Short neck jar (9GW70).

This form has a round to spherical body, a probable rounded base, constricted neck, and out-flaring rim (Figure 6.7 and Figure 6.8). The neck exhibits rapid constriction that begins almost immediately below the lip, producing a distinctively short neck. Paste is grit-tempered. Exterior surfaces may be plain or stamped in either the concentric diamond/oval or line block motif. This form appears to have been manufactured in one size as indicated by a small range of orifice diameters (13 cm to 26 cm) (see Figure 6.16). This range reflects the size range observed for the Barnett phase flaring rim bowls (10 cm to 26 cm), which were manufactured in only one size (Hally 1986).

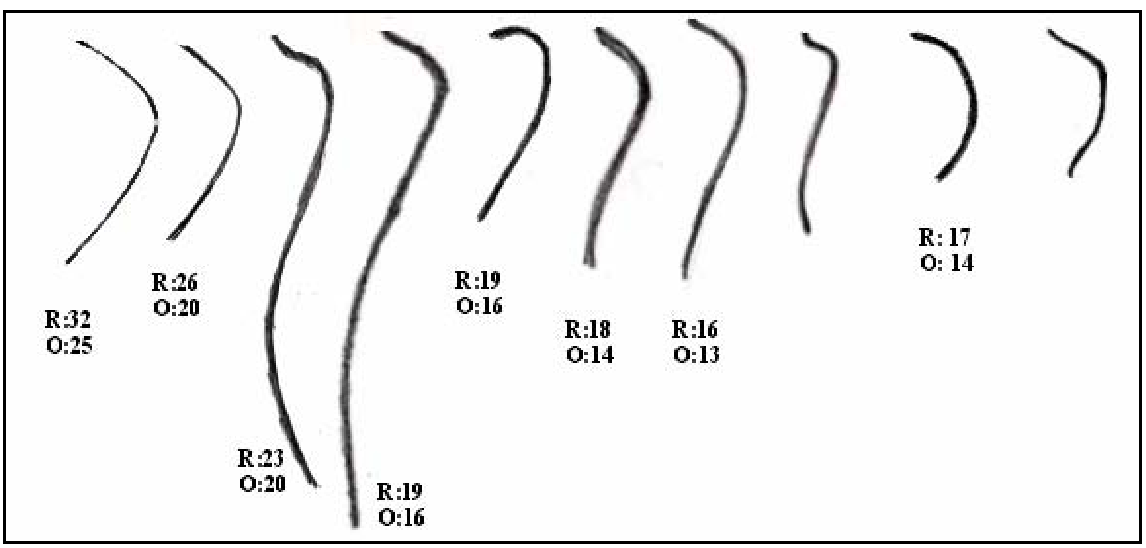

Figure 6.8 Rim profiles for the Woodstock short neck jar. Maximum rim (R) and maximum orifice (O) diameters (in cm) are noted.

6.5b Shouldered Jar

Figure 6.9 Shouldered jar (9GW70).

This form has a round to spherical body, small orifice, and short neck with a less pronounced shoulder (Figure 6.9 and Figure 6.10). Paste is grit-tempered. Exterior surfaces may be plain or stamped in either the concentric diamond/oval or line block motif. The range of size distributions is 15 cm to 40 cm (see Figure 6.16), which mirrors the size distributions for the Barnett phase carinated bowl (14 cm to 42 cm; two sizes) and rounded bowl (8 cm to 35 cm; two sizes) (Hally 1986). Shouldered jars were likely manufactured in at least two distinct sizes.

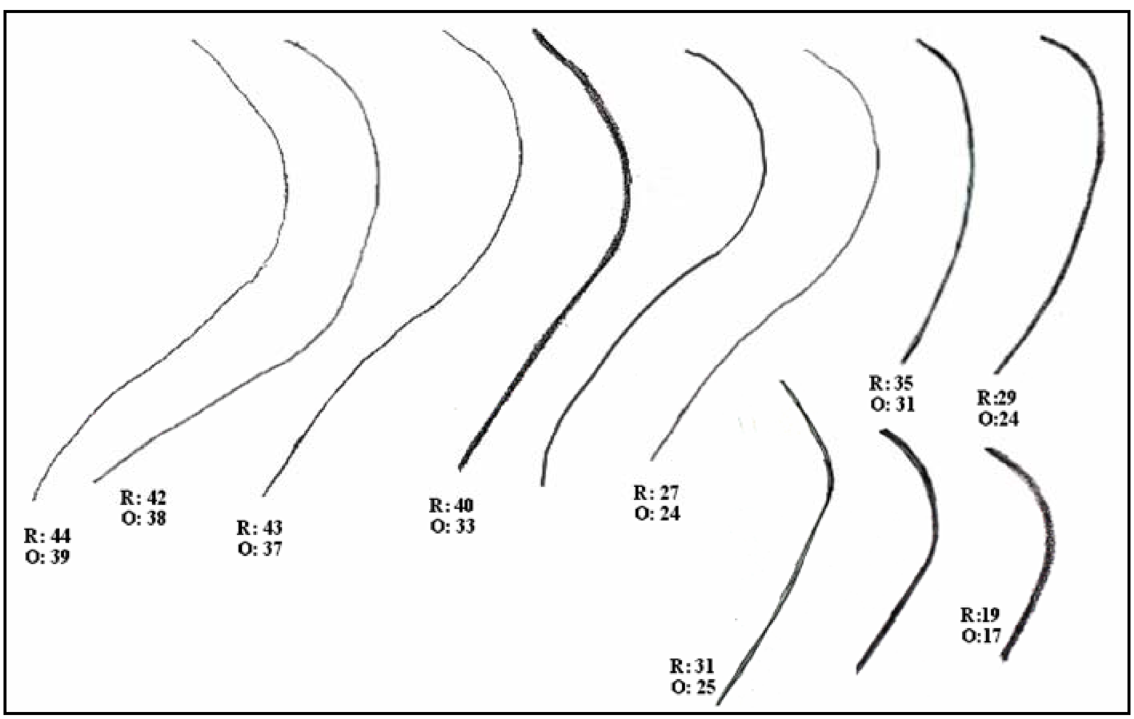

Figure 6.10 Rim profiles for the Woodstock shouldered jar. Maximum rim (R) and maximum orifice (O) diameters (in cm) are noted.

6.5c Flaring Rim Jar

Figure 6.11 Flaring rim jar (9GW70).

This form has a round body, a probable rounded base, constricted neck, and out-flaring rim (Figure 6.11 and Figure 6.12). The neck exhibits less rapid constriction than the short neck jar, creating a longer neck area and contributing to a more pronounced shoulder and flaring of the rim. Vessels are grit-tempered. Exterior surfaces may be plain or stamped in either the concentric diamond/oval or line block motif.

The range (15 cm to 40 cm) (see Figure 6.16) of size distributions is similar to the range of orifice diameters for the carinated bowl (14 cm to 42 cm) and rounded bowl (8 cm to 35 cm) shape classes in the Barnett phase vessel assemblage (see Hally 1986:275). Flaring rim jars were likely manufactured in at least two distinct sizes.

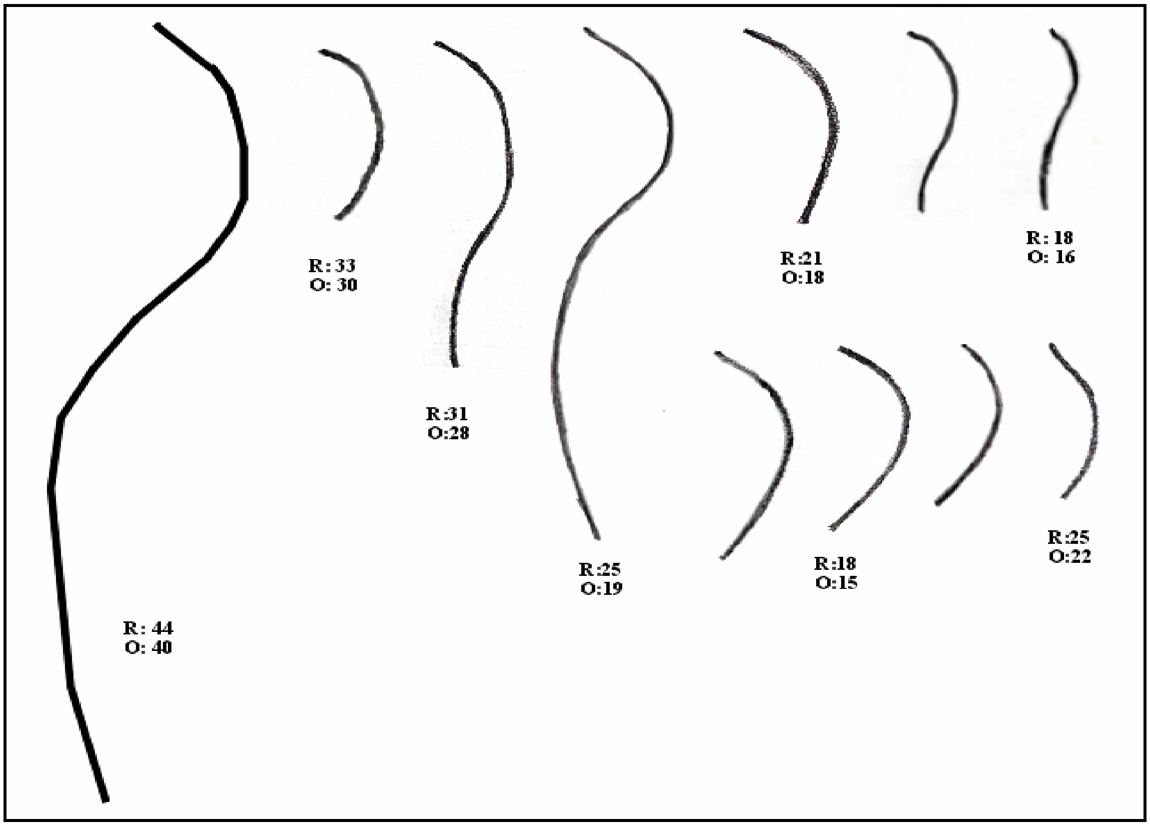

Figure 6.12 Rim profiles for the Woodstock flaring rim jar. Maximum rim (R) and maximum orifice (O) diameters (in cm) are noted.

Figure 6.13 Carinated bowl (9GW70).

6.5d Carinated Bowl

This vessel form is represented in the study collection by only one rim sherd. The vessel base is absent. Although it is difficult to accurately depict the profile due to the vessel's small size, the shoulder appears to exhibit the characteristic "break in vessel profile where the inward sloping upper wall meets the rounded lower wall" (Figure 6.13 and Figure 6.14) that distinguishes carinated vessel forms (Hally 1986:277). The exterior surface is plain, and the tempering is grit. On the basis of a single rim sherd, no size distinctions can be made for this tentative shape class.

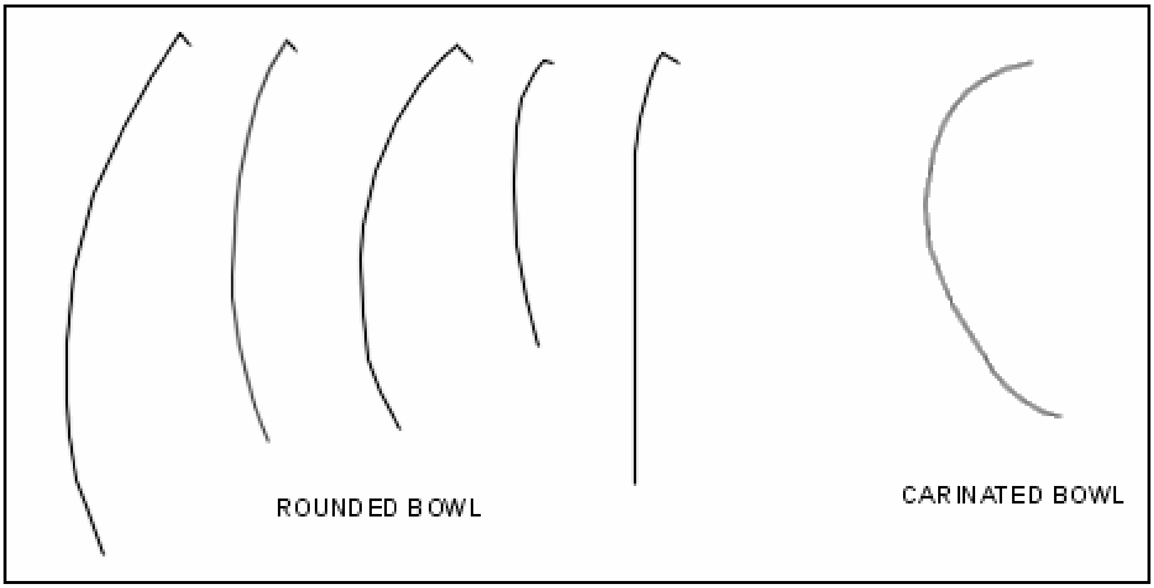

Figure 6.14 All Woodstock rounded and carinated bowl profiles.

6.5e Rounded Bowl

This form has sides that are rounded and rims that are vertical or insloping (Figure 6.14 and Figure 6.15). This shape class is represented by only five rim sherds or partial vessels. Vessels are grit-tempered. Exterior surfaces may be plain or stamped in either the concentric diamond/oval or line block motif.

Figure 6.15 Rounded bowl (from 9GW70).

6.5f Discussion

Of the sample of rim profiles (n=80), 41 were large enough to allow reasonably accurate measurement of orifice diameter. Orifice diameters were plotted by vessel shape in frequency histograms (Figure 6.16).

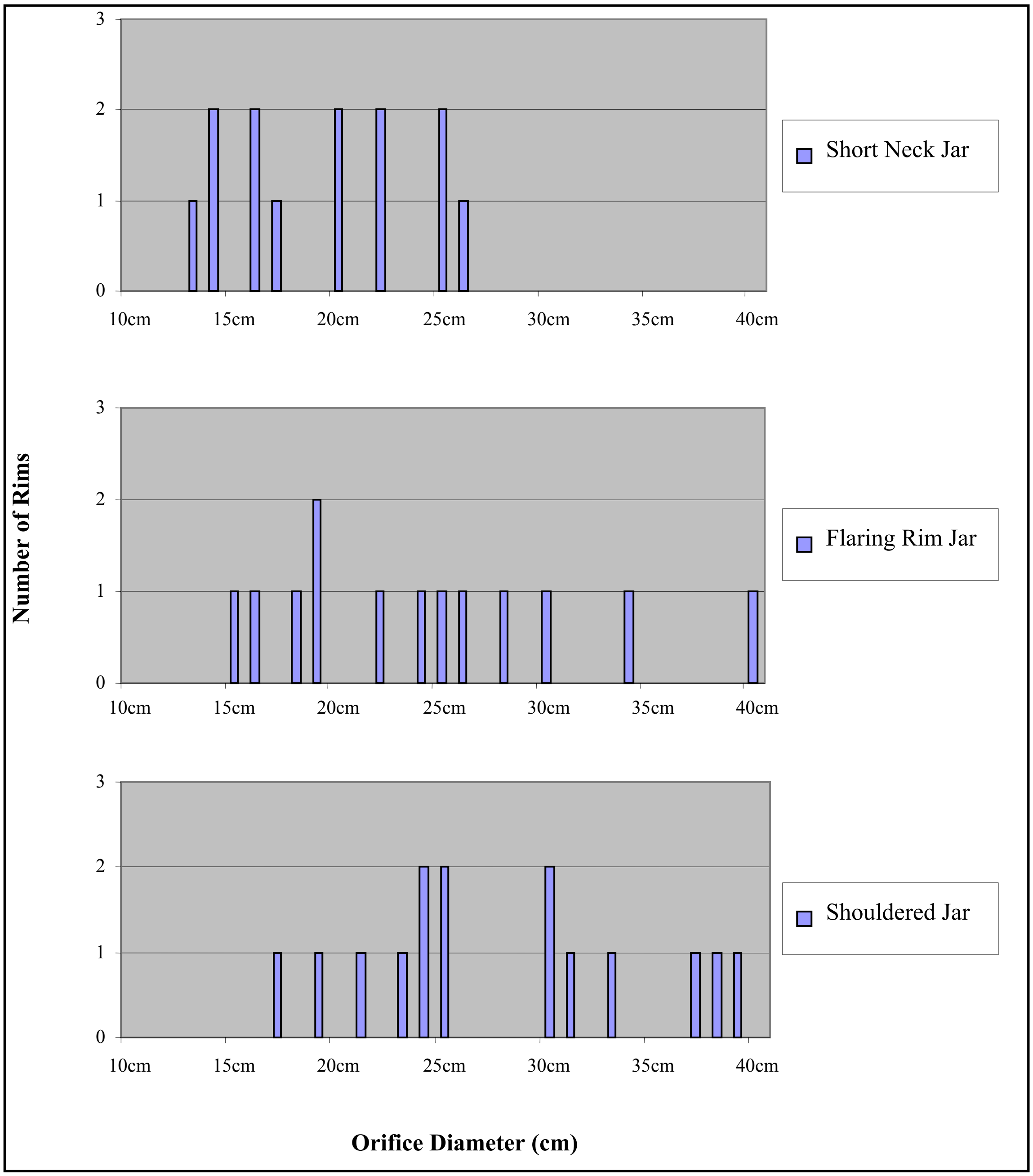

Figure 6.16 Size distributions of Woodstock orifice diameters by vessel-shape class.

The figure reveals that short neck jar orifice diameters are unimodally distributed, exhibiting a similar orifice diameter range (13 cm to 26 cm) as the Barnett phase flaring rim bowl (10 cm to 26 cm), which occurs in only one size (Hally 1986). The greater range of orifice diameters for the flaring rim jar (15 cm to 40 cm) and shouldered jar (17 cm to 40 cm) suggests that each vessel form has at least two size classes. This assertion is supported by the similarity in orifice diameter ranges for the Barnett phase carinated bowl (15 cm to 42 cm; two sizes), rounded bowl (5 cm to 34 cm; two sizes), and Mississippian jar (8 cm to 33 cm) (Hally 1986).

The orifice diameter range of the Barnett phase pinched rim jar (12 cm to 50 cm) suggests that the Woodstock flaring rim jar may occur in three size classes as the orifice diameter ranges are similar, 35 cm and 38 cm for the Woodstock flaring rim jar and Barnett pinched rim jar, respectively. The clustering of orifice measurements within narrow size ranges indicates that culturally standardized size classes exist within each class of vessel shapes.

6.6 Comparison of Vessel Assemblages

Complicated stamping designs continue through the Wilbanks, Savannah, and Lamar cultures (Table 6.3) with few changes (Figure 6.17), although earlier archaeologists (Fairbanks 1950; Sears 1958) argued that the Savannah phase represented a break in the *in situ* development of complicated stamping in north Georgia (Hally and Rudolph 1986).

Table 6.3 Georgia cultural sequences by drainage (from Hally and Rudolph 1986:27).

	Period	**Culture**	**Etowah**	**Coosawattee**	**Upper Savannah/ Tugalo**
A.D. 1600					
A.D. 1500	Late Mississippian	Lamar	Brewster	Barnett	Tugalo
A.D. 1400			Stamp Creek	Little Egypt	Rembert
A.D. 1300	Middle Mississippian	Savannah	Wilbanks		Beaverdam
A.D. 1200				Etowah III	
A.D. 1100		Etowah/ Averett	Etowah IV III		Jarrett
A.D. 1000	Early Mississippian		II I		
A.D. 900		Woodstock/ Averett	Woodstock	Woodstock	Woodstock
A.D. 800					
A.D. 700	Late Woodland	Swift Creek/ Napier	Swift Creek/ Napier	Swift Creek/ Napier	Swift Creek/ Napier
A.D. 600					

The Lamar culture is characterized by three phases – Little Egypt, Barnett, and Brewster - and again shows continuity in design elements (Figure 6.17) such as the filfot cross, concentric circles, and a figure eight, which is similar to the preceding figure nine motif (Hally and Langford 1988). This continuity in motifs argues that changes occurring in north Georgia were not necessarily the result of the introduction of Mississippian traits or ideas but the result of local developments.

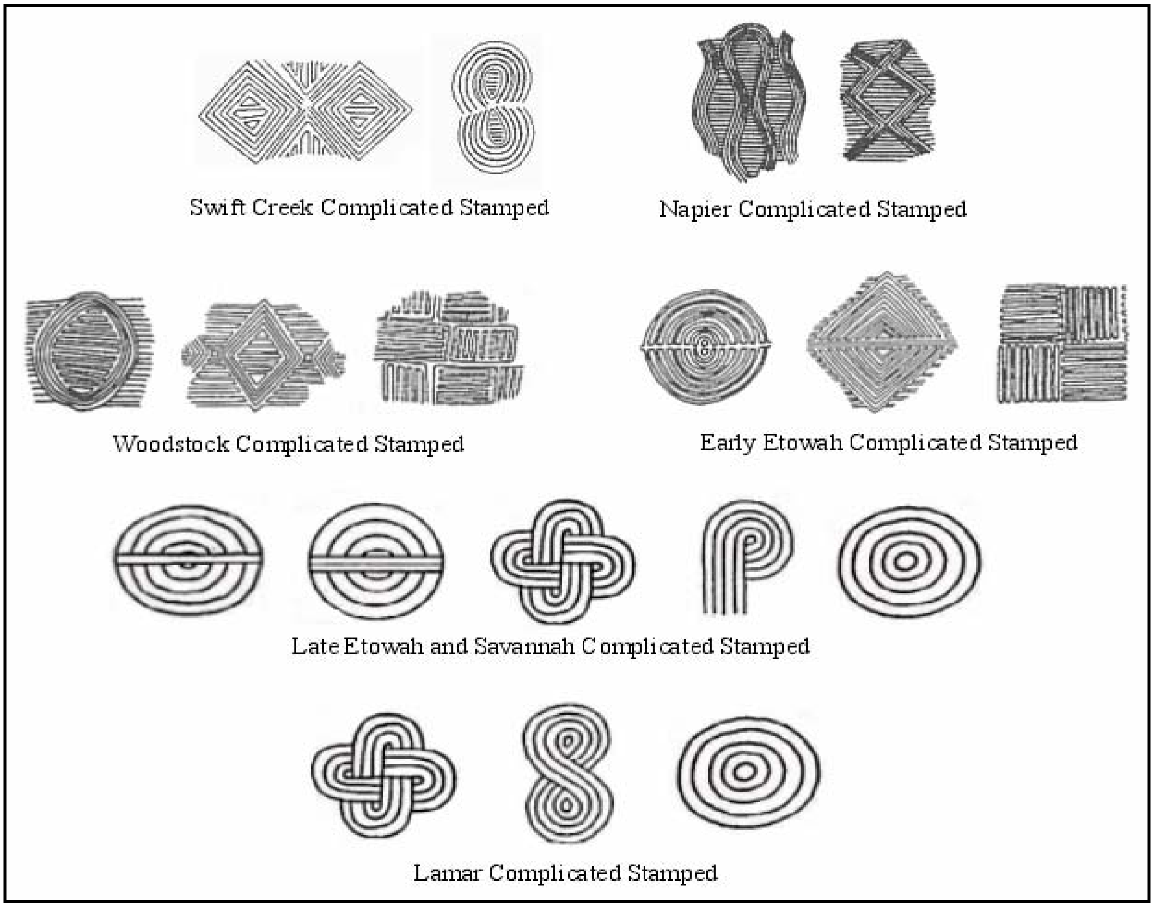

Figure 6.17 Comparison of complicated stamping motifs (adapted from Wauchope 1966:58,61,69 and King 2001:8).

A comparison of the Woodstock phase vessel assemblage to our current understanding of the general Late Woodland vessel assemblage (jars with a short neck, slight shoulder, and a generally rounded to conical base, and simple bowls) indicates that the diversification in vessel forms seen in the Mississippian period began in the Woodstock phase. Woodstock groups added new vessel forms to their ceramic repertoire as indicated by the shouldered jar, flaring rim jar, and carinated bowl forms. Two vessel forms – flaring rim jar and shouldered jar - were made in at least two different sizes, presumably to serve different functions as needed to meet different food preparation needs.

Comparison of the Woodstock phase assemblage to the Etowah phase assemblage reveals that, except for the occurrence of one red-filmed hooded bottle and two loop handles, the two assemblages are strikingly similar. The new vessel forms that were added to the existing Late Woodland vessel assemblage during the Woodstock phase remain basically unchanged into the Etowah phase. The Early Etowah shouldered jar profiles look like the Woodstock shouldered jar profiles. The Early Etowah flaring rim jar resembles the Woodstock flaring rim jar in that the shoulder does not project much beyond the rim. So, while the Early Etowah phase appears to begin to exhibit a few typical Mississippian ceramic features, such as red filming, hooded bottles, and the addition of handles, the critical initial change in vessel forms, and by extension vessel function, occurred in the Woodstock phase.

A similar pattern is revealed when the Emergent Mississippian Martin Farm (A.D. 900 to A.D. 1000) vessel assemblage is compared to the Early Mississippian Hiwassee Island (A.D. 1000 to A.D. 1300) assemblage. Although temper shifts from limestone and shell in the Martin Farm phase to the almost exclusive use of shell in the Hiwassee Island phase, "data regarding vessel morphology suggest little difference" between the two phases (Schroedl et al. 1985:229). Ceramic analysis indicated that the Martin Farm vessel assemblage included limestone tempered loop handles that appear to be exclusive to this occupation. In contrast, no limestone tempered loop handles were encountered from the subsequent Hiwassee Island phase (Schroedl et al. 1985:461). Schroedl et al. argue that the persistence of limestone tempering in conjunction with a shift toward shell tempering indicates a possible functional difference between the wares.

Hally's analysis of the Late Mississippian Barnett phase vessel assemblage had important implications for understanding pottery usage as well as food preparation, storage, and consumption practices in the pre-European contact southeastern United States. The geographically widespread nature of a single food use pattern (hominy-beans-pottage) prior to European contact argues for the antiquity of this pattern, dating to the appearance of intensive maize cultivation around A.D. 1000 (Hally 1986). A single food use pattern in the Mississippian period should produce across the widespread geographic region vessel assemblages that are similar to the Barnett phase assemblage. Such an assemblage would consist of: a large jar for storing liquid contents; a large bowl for cooking and serving soups and stews; two distinct cooking jars; and few to no bottles or individual serving bowls (Hally 1986:291).

The appearance of distinctive forms of pottery, which were commonly shell-tempered, has often been regarded as the result of the diffusion of Mississippian culture into new areas. However, Late Mississippian vessel assemblages, while significantly similar, are not complete replications of a single, diffused Mississippian ceramic repertoire. The Barnett phase assemblage contains strap-handled Mississippian and pinched rim jar forms that do not occur in the other Late Mississippian assemblages. Instead, the existence of similarly shaped vessel forms in the other Late Mississippian vessel assemblages suggests that changes in vessel forms, in the context of region-wide persistence of complicated stamped designs, were not the result of Mississippian influence but the result of a need for two distinct jar forms to process different foods.

As most sherd categories diagnostic of the Mississippian Hiwassee Island phase have their origin in the Emergent Mississippian Martin Farm phase (Schroedl et al. 1985), the continuity in ceramic motifs from the Woodstock phase to the Barnett phase likewise argues for *in situ* cultural change rather than the replacement of technology or people by migrating Mississippian groups. The most common jar forms in both the Woodstock and Early Etowah phases are Mississippian in exhibiting more exaggerated neck constriction, outflaring rims, and pronounced shoulders, but the complicated stamping is local in origin. In conjunction with new botanical data that establish the intensification of maize cultivation during the Woodstock phase (see Chapter 5, section *5.4 Interpretation of Woodstock Subsistence Data* for a full discussion), these changes in the Woodstock vessel assemblage suggest a break from Woodland vessel forms and usages. When considered in light of the analysis of Barnett phase vessel function, the addition of two new jar forms (flaring rim and shouldered jar) and multiple size classes within the new forms likewise argues that these changes in vessel forms were not the result of Mississippian influence but the result of a need for distinct jar forms to process different foods, most notably maize.

CHAPTER 7

WOODSTOCK SITE LOCATION PREFERENCES

Settlement patterns and changes within these patterns are causally related to changes in subsistence strategies as well as in political organization. For this reason, models regarding the evolution of complex societies often focus on the significance of increasingly intensive forms of agriculture in terms of the degree of access to land, the ability of individuals to control the labor of others, and the generation and use of agricultural surpluses for a variety of purposes (Milner and Oliver 1999). In areas with temperate climates and adequate rainfall, agricultural settlements are often located on or near flood plains of large rivers because these rivers typically have larger flood plains and thus provide larger tracts of arable land (Anderson 1996; Larson 1972; Smith 1978). In this chapter, I investigate whether Woodstock phase site distributions show a greater or lesser preference for floodplain locations than do Late Woodland and Etowah phase site distributions.

In this chapter "upland" denotes the hilly terrain adjacent to and beyond flat valley floors, while the valley floors and the flood plains of major and minor streams are denoted as "lowlands". Lowlands are characterized by the lowest lying and most recently formed alluvial soils, or those soils that are subject to being submerged by overbank flooding. Overbank flooding leads to the development of natural levees, or narrow strips of slightly higher ground, immediately adjacent to the stream bank (Bennett 1921).

Archaeologists in the eastern United States have often argued that the best location for aboriginal cultivation of maize was in the alluvial flood plains of rivers and streams. Ward (1965) asserted that certain types of soils, i.e. loams, are strongly related to the location of Mississippian sites because these soils are highly suitable for intensive maize cultivation. Ward found that Mississippian mound sites in Georgia, Mississippi, and Tennessee were located on or near (within one mile) sandy and silt loams of flood plains because these soils were more productive for aboriginal cultivation practices than the surrounding upland limestone soils. Loams are ideally suited for agriculture because they are a mixture of sand, silt, and clay (Lyon 1952). Loams do not have the negative looseness and low water-holding capacity of sand, stickiness of wet clay, or hardness of dry clay (Lyon 1952). Deposited by over bank flooding, these soils are located immediately adjacent to streams. Clayey soils could not easily be cultivated with Mississippian implements such as a digging stick or hoe. In contrast, the friable loams could easily be cultivated with Mississippian technology.

Meyers (1995:44) noted that the general assumption in the archaeological community is that flood plain soils are "inherently fertile cultivation areas" but pointed out that few studies focusing particularly on flood plain fertility and aboriginal cultivation techniques exist. Examining the natural factors that influenced settlement distributions of Mississippian chiefdoms in northwest Georgia, Meyers (1995) assessed the tendency of settlements to be located immediately below the Great Smoky Fault on or adjacent to large river flood plains, where they had access to both upland resources and arable flood plain soils. Meyers examined soil morphology (soil horizons, soil moisture and temperature, parent material, etc.), soil fertility, and the nature of alluvial soils in general.

She concluded that the soils along the major rivers in northwest Georgia are particularly well-suited to the cultivation of maize because they have an abundant natural availability of nitrogen, phosphorus, and potassium – the three soil elements most critical for successful maize production (Meyers 1995).

Meyers (1995:47) further suggests that the availability of large tracts of alluvial flood plain with a higher water table which mitigated the risk of crop loss due to drought, easily tilled soils, and the renewal of nutrients through periodic over bank flooding contributed to productive maize cultivation in the flood plains versus the uplands. In the Chickamauga Valley, soils of the Chewacla and Toccoa series can yield between 55 to 70 bushels of maize per acre under intensive management (Tate 1978). However, along the large streams of the broad, flat Great Valley, soils of these same series can yield 80 to 100 bushels of maize per acre (Bramlett 1965; Tate 1978). Soils along the scattered ridge tops are poorly suited for cultivation (Hally and Langford 1988; Pehl and Brim 1985).

In the American Bottom, large tracts of fertile bottom land enabled the settlement of greater numbers of people who could produce more crops and create surpluses that could be manipulated by Cahokia's chiefs (Milner and Oliver 1999; Rindos and Johannessen 1991). Bruce Smith has also argued that access to large tracts of arable soils was preferable during Mississippian period phases because these soils could easily support the intensive cultivation of maize, which helped to perpetuate a centralized political system. Elite individuals living in central mound centers were frequently supported by foodstuffs produced by populations in subordinate villages and farmsteads (Smith 1978, 1992).

Through systematic survey, Schroeder (1997) has demonstrated that the most common locations for Late Woodland through Mississippian period sites in the American Bottom were in settings with a variable mix of three flood plain landforms: deep wetlands that harbored fish, shallow wetlands that sustained aquatic plants and attracted migratory waterfowl, and dry lands that were suitable for habitation and cultivation. The natural levees of flood plains of large rivers provided easily tilled soils that were annually replenished with nutrient rich floodwaters as well as stretches of dry land above the flood plain that enabled the construction of permanent settlements (Baden 1987; Baden and Beekman 2001; Schroeder 1997).

Assessing soil characteristics such as slope, depth, drainage, and tendency to erode, Baden (1987) demonstrated that only a subset of soils in the Little Tennessee River valley would have been suitable to produce the maize yields of 8 to 12 bushels per acre needed to support Mississippian populations utilizing a technologically-simple horticultural system. All of the soils in Baden's subset were loams that were deposited by annual floodwaters. Schroeder used nineteenth century ethnohistorical and historical government documents that recorded maize yields as a proxy for quantifying maize productivity for Mississippian farmers. Schroeder (1999) used the determination of an average available yield of about 18.9 bushels per acre for nineteenth century Native American farmers to assert that, employing traditional techniques, Mississippian farmers could likely produce an average available yield of about 10 bushels per acre.

In chapter 2, I reviewed the published data on crop productivity of soil types that occur in northern Georgia. These data support the generally held view that flood plain soils are superior for aboriginal maize cultivation. Comparing modern maize yields under improved management practices such as the use of fertilizers, high yielding crop varieties, and water management systems, flood plain soils produce higher average yields (see Soil Conservation Service data presented in Table 2.4), ranging from an additional 20 bushels per acre to as many as 45 additional bushels per acre. Although not as large a difference, where modern yields under common management were provided, flood plain soils produced higher average yields than upland soils (see Soil Conservation Service data presented in Table 2.4), ranging from an additional 7 to 10 bushels per acre. This range fits nicely with Schroeder's (1997; 1999) assessment of the productive potential of Mississippian farmers. Available yields refer to the amount of potential yields that are actually harvested (Schroeder 2001). As potential yields denote the optimal or maximum yields possible under ideal circumstances, available yields are more appropriate for the assessment of the potential productivity of Mississippian farmers.

To the extent that these factors do affect the productivity of maize cultivation, we should expect to see differences in the reliance on maize cultivation in Woodland and Mississippian cultures reflected in settlement patterns. Determination of Woodstock settlement patterns is important for assessing what type of subsistence regime was employed during this transitional phase. My assessment of Woodstock settlement patterns on the north Georgia regional level focuses on site distributions in terms of (1) upland or lowland preference, (2) major or minor river flood plain preference, and (3) distance of settlements from flood plains of major or minor rivers.

To address regional questions of settlement preference, I examined the distribution of sites for the Swift Creek, Woodstock, and Etowah phases in the 44 north Georgia counties that comprised my study area (see Figure 1.2). Using U. S. Geological scale maps (1:120,000), I determined the location of each site first in terms of flood plain versus upland location and second in terms of location on a major river versus a minor tributary.

7.1 Flood Plain Access

Existing settlement pattern data for northern Georgia indicate that Late Woodland sites were located on flood plains of rivers rather than on adjacent upland soils. Existing data shows that Mississippian sites are more heavily concentrated on large flood plains and minimally located in uplands. In contrast, current published data suggest that the Woodstock settlement pattern reflects equivalent use of uplands and flood plains of large rivers (Cobb and Garrow 1996; Rudolph 1991). The location of Woodstock sites on uplands and flood plains is important for determining (a) what types of resources were being accessed (i.e. upland collection areas versus bottomland arable soils) and (b) the ability of Woodstock phase settlements to support larger and denser populations and ultimately a centralized political system as is known to have occurred later in the Mississippian period. The assumption that river bottom soils possess a higher productive potential than adjacent upland soils has been examined by various archaeologists attempting to explain Mississippian settlement patterns (Kowalewski and Hatch 1991; Peebles 1978; Smith 1978; Ward 1965).

I recorded the location of every eligible site for the Swift Creek, Napier, Woodstock, and Etowah phases in terms of location relative to flood plain. I designated sites located within two contour lines (contour interval of 20 feet) of the flood plain as *lowland* and sites located more than two contour lines above the flood plain as *upland* (see

Kowalewski and Hatch 1991 for a comparable designation of nonriverine, predominately upland, sites as occurring 20 m to 40 m above the nearest stream). Gross comparison of the data challenges prevailing conceptions concerning Woodstock settlement patterns. Woodstock settlement does not reflect equivalent use of uplands and lowlands but indicates a strong preference for lowlands (Table 7.1).

Table 7.1 Lowland versus upland settlement preference by phase.

	Lowland	Upland
Napier	44	3
Swift Creek	112	22
Woodstock	182	23
Etowah	143	20

There is no difference between Woodstock and the succeeding Etowah phase (χ^2 = .108, p = .80) in terms of flood plain versus upland settlement. However, the data also fail to demonstrate a stronger Mississippian versus Late Woodland preference for lowland settlement. Only a slight difference is noted between Woodstock and the preceding Swift Creek (χ^2 = 1.71, p = .20) and Napier (x^2 = 1.31, p = .30) phases. A similar pattern occurs when Swift Creek and Etowah (χ^2 = 1.01, p = .30) and Napier and Etowah (χ^2 = 1.4, p = .30) settlement location are compared. Additionally, no statistically significant difference is noted between the Napier and Swift Creek phases (χ^2 = 2.27, p = .20). Overall the above data support the assertion that there were no differences in residential preference over this time period. This assessment supports Rudolph's (1991) argument that Late Woodland Napier phase settlements move from uplands and flood plains of small tributaries to the islands, levees, wider flood plains of the larger Savannah, Oconee, and Etowah rivers. It does not support a significant increase in lowland settlement at the beginning of the Mississippian period.

Comparison of settlement location by sub-phase (Table 7.2) further indicates a general preference for lowlands during in the Late Woodland period and that continued into the Mississippian period. A potentially significant change is noted between the Napier and Early Woodstock phases ($\chi^2 = 3.81$, $p < .1$). In all other phases, however, preference toward lowland settlement remains basically unchanged: Swift Creek and Early Woodstock ($\chi^2=1.01$, $p=.30$), Early Woodstock and Late Woodstock ($\chi^2 = 1.77$, $p = .20$), and Late Woodstock and Early Etowah ($\chi^2 = 1.09$, $p = .30$).

Table 7.2 Lowland versus upland settlement preference by sub-phase.

	Lowland	Upland
Napier	44	3
Swift Creek	112	22
Early Woodstock*	28	8
Late Woodstock*	26	3
Early Etowah*	19	1

*Based on ceramic reanalysis (see Chapter 4: Redefining Woodstock Chronology).

7.2 Size of River and Distance to Flood Plain

Throughout history, water resources have been critical in determining settlement locations. Settlement models for middle and late Mississippian settlement reveal that Mississippian sites are most common in and adjacent to large areas of alluvial flood plain. Evidenced in the Georgia Piedmont province, this pattern is most likely due to the emphasis on intensive crop cultivation and the suitability of flood plain soils for the cultivation techniques employed by Mississippian groups (Hally and Rudolph 1986).

During the Late Mississippian period, it has been shown that streams provided not only arable land but also rich protein sources in the form of fish and shellfish (Shapiro 1990) as well as lines of communication and transport (Lee 1977). In larger river valleys, broad meander belts of natural levee soils were "highly prized by prehistoric farmers" as these wide tracts of arable land were annually replenished by floodwaters and were easily tilled (Smith 1992:114). The levee soils were easily worked with stone and shell hoes, and the fertile alluvium allowed maize to thrive (Milner and Oliver 1999). Thus, in the central Mississippi River valley, by the Mississippian period the mound centers, villages, and farmsteads of maize agriculturalists were almost exclusively situated on or adjacent to the wide zones of natural levee soils of large rivers (Smith 1978).

The Mississippi River Valley embraces the largest continuous body of alluvial land in North America. Although the bottoms of the Mississippi River and its tributaries are extremely rich and are argued to be unparalleled in fertility and productiveness (Bennett 1921; Lowden 1919), much of the area is comprised of low-lying back swamps that are unsuitable for cultivation. In recent history, these back swamps have been reclaimed for cultivation through channel dredging and the construction of levees (Bennett 1921). Silt loams, silty clay loams, and very fine sandy loams occur in strips near the banks of active streams and abandoned stream channels. These relatively higher ridges and areas protected by levees are better drained and are extensively cultivated, producing high yields of a wide variety of crops, including maize.

Mississippian settlements in the Mississippi River valley were located on the levees of broad river flood plains, where the best horticultural soils were located. Numerous farmsteads dispersed linearly along these levees were integrated into the Mississippian system through association with a larger village or mound center (Smith 1978). A pattern of large, fortified villages centrally located to these small farmsteads enabled the efficient utilization of energy sources and the maintenance and defense of outlying settlements. Adjacent to oxbow lakes, levees provided easy access to abundant sources of protein, namely fish and waterfowl (Smith 1978). Mississippian populations could balance access to two different, seasonally exploited subsistence resources. In the summer, populations were bound to their fields and could not easily leave to hunt deer; the aquatic species would have provided a suitable substitute for animal protein during this time.

In the north Georgia Ridge and Valley and Piedmont physiographic regions, the suitability of flood plain soils for intensive cultivation of maize should not be minimized. The extensive alluvial soils located along river flood plains in the Great Valley and Piedmont are well suited for agriculture because they are well-drained and easily worked, and flooding deposits fresh alluvium, which replenishes soil nutrients removed by crops (Hally and Langford 1988). In the Piedmont, rivers are segmented, meandering within relatively broad flood plains until they cross areas of more resistant geologic/rock substrata, creating shoals (Shapiro 1990). Here the shoals, like oxbow lakes, provide easy access to aquatic resources. In the Ridge and Valley, extensive shoals are present where the Etowah, Coosawattee, and Conasauga Rivers cross the Cartersville Fault and enter the Great Valley District but are otherwise non-existent along the major rivers (Hally and Langford 1988:9).

A relative guide to stream network classification, stream order, which is a measure of a stream's position in a hierarchy of tributaries (Leopold 1994) (Figure 7.1) allows the assessment of the size and potential power of streams from the smallest streams that have no branches (First Order) to streams the size of the Mississippi (Tenth Order).

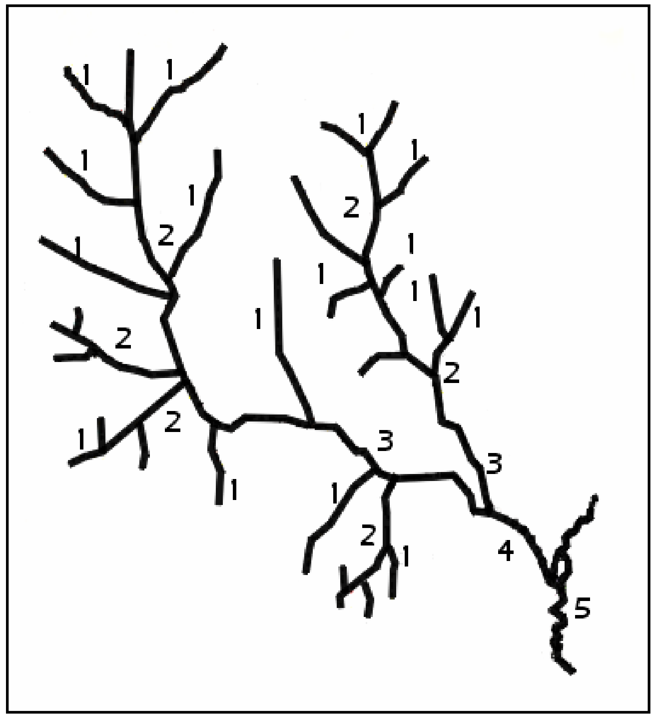

Figure 7.1 Diagram of stream orders.

For the north Georgia study area, I utilized stream order, rather than streamflow or discharge, to assess whether a stream constituted a major river or minor tributary because stream order is more appropriate for assessing the relative size of a stream's flood plain. Streamflow relates to the movement of water as influenced by gravitational forces through "well-defined, semi-permanent surface channels" (Linsley et al. 1949182). Streamflow is based upon measurements of stream discharge, or the amount of water flowing in a stream, in *cubic feet per second* [cfs] or *second-feet*. Streamflow data include (1) peak-flow data that are important for designing flood-control systems and (2) minimum-flow data, which are critical for estimating the dependability of a water supply (Butler 1957).

Although not a universal rule as different points along a stream may in reality differ in flood plain width, in general, stream order provides the most accessible approximation of flood plain size and extent of arable land. Lower order streams are actively eroding their channels, resulting in steep-sided valleys in which the stream itself occupies the entire narrow floor (Linsley et al. 1949). As a stream's order increases, it no longer erodes its channel deeper but begins lateral erosion, which results in the development of a narrow flood plain (Linsley et al. 1949). Highest order streams, like the Mississippi River, have wide flood plains and broad meander belts, due to the effective grading of all channels (Linsley et al. 1949). Highest order, or mature, streams are frequently characterized by flood plains that are wider than their meander belts, which are usually "10 to 20 times their mean channel widths" (Linsley et al. 1949:255).

Using U. S. Geological scale maps (1:120,000), I recorded the location of every eligible site for the Swift Creek, Woodstock, and Etowah phases in terms of location relative to flood plain. I determined the order of the nearest stream (<1 km) and measured the straight-line distance (in km) between the site and the stream with a standard metric ruler. I then recorded the straight-line distance between each site and the next higher order stream up to a distance of 20 km. Applying Strahler's (1964) order system to north Georgia, I designated first and second order streams as minor tributaries, and third and higher order streams as major rivers (Table 7.3).

In terms of stream size preference, comparison of gross locational data shows a preference for settlement on flood plains of larger rivers during all phases, with a slight shift suggested between Swift Creek and Woodstock ($\chi^2 = 1.67$, $p = .20$). There is no statistical difference between Napier and Woodstock ($\chi^2 = .112$, $p = .80$), Napier and

Etowah ($\chi^2 = .116$, $p = .80$), nor Woodstock and Etowah ($\chi^2 = .17$, $p = .70$) (Table 7.3). No significant change is evident between the Napier and Swift Creek phases ($\chi^2 = 1.06$, $p = .20$).

Table 7.3 Stream size preference by phase.

	Major River	Minor Tributary
Napier	28	16
Swift Creek	66	45
Woodstock	117	71
Etowah	99	65

This apparent lack of contrast in settlement preference may be the result of the inclusion of both upland and lowland settlements in the above comparison. When only lowland or flood plain sites are considered in the comparison of stream size preference by sub-phase (Table 7.4), a shift toward larger flood plains during the Woodstock phase is evident. The variations noted between Swift Creek and Early Woodstock ($\chi^2 = 5.23$, $p < .05$) and Napier and Early Woodstock ($\chi^2 = 2.75$, $p < .10$) clearly indicate a shift toward larger flood plains during the Emergent Mississippian Woodstock phase.

Continued preference toward settlement on flood plains of larger rivers is indicated by a nominal difference between the Early Woodstock and Late Woodstock phases ($\chi^2 = .496$, $p = .50$). A complete absence of variance in settlement preference between Late Woodstock and Early Etowah ($\chi^2 = .0$, $p > .99$) suggests that the established Mississippian pattern of settlement near large tracts of arable land, i.e. flood plains of large rivers, was well in place prior to the Mississippian Etowah period in north Georgia.

Table 7.4 Stream size preference by sub-phase.

	Major River	Minor Tributary
Napier	28	16
Swift Creek	66	45
Early Woodstock*	22	4
Late Woodstock*	20	6
Early Etowah*	14	4

*Based on ceramic reanalysis (see Chapter 4: Redefining Woodstock Chronology).

Chung Ho Lee analyzed the locations of Late Mississippian sites in the Oconee River drainage in terms of distance to the nearest stream (river) and size (order) of each stream to determine the proximity of sites to large alluvial flood plains (Lee 1977). Lee found that 61% of sites were located near drainages of Order 3, 4, and 5; 75.2 % of sites were located within 300 m of any order drainage; and 96.7% of total sites were located within 600 m (1977). Larger sites were located near high order streams, indicating that primary activity centers during the Late Mississippian period were located along the Oconee River or its major tributaries (Lee 1977).

I applied this approach to site locations for Napier, Swift Creek, Woodstock, and Etowah settlements throughout the north Georgia study area. In the Napier phase 49% of sites (n=47) are located near Order 3 or higher streams, and 91% of sites are located less than 300 m from any order stream, while 96% are located within 500 m (Figure 7.2). In the Swift Creek phase, 40% of sites (n=133) are located near Order 3 or higher streams, 95% of sites are located less than 300 m from any order stream, and 98% are located within 500 m (Figure 7.2).

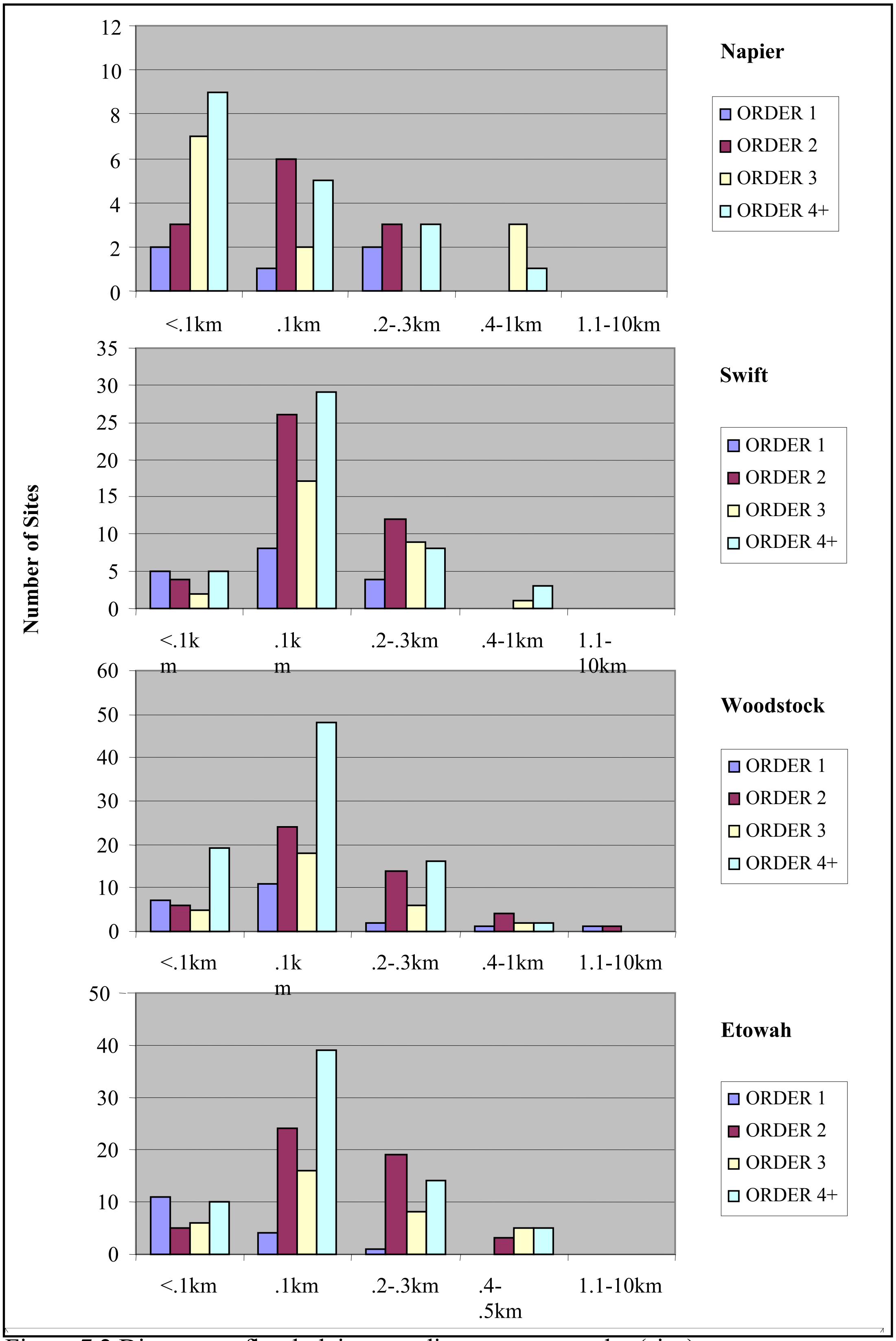

Figure 7.2 Distance to flood plain according to stream order (size).

Similarly, during the Woodstock phase, 48% of sites (n=187) are located near Order 3 or higher streams, and 95% of sites are located less than 300 m from any order stream, while 98% are located within 500 m (Figure 7.2). The pattern continues in the Etowah phase, with 43% of sites (n=170) being located near Order 3 or higher streams, 93% of sites being located less than 300 m from any order stream, and 98% being located within 500 m (Figure 7.2).

Woodstock and Etowah phase settlement patterns reflect the pattern found by Lee for Late Mississippian settlement in the Oconee River drainage, but the Swift Creek and Napier patterns vary little from the model as well. Sites of all phases tend to be located very near flood plains, regardless of the size of the river.

Table 7.5 Settlement locations according to stream order.

	Order 3+ (≤100 m)	Any Order (≤300 m)	Any Order (≤500 m)
Napier	23	43	45
Swift Creek	53	127	131
Woodstock	90	178	184
Etowah	70	152	160

The data show relatively little difference between Woodstock and Etowah ($\chi^2 = .32$, $df = 2$, $p = .90$) or between Napier and Woodstock ($\chi^2 = .085$, $df = 2$, $p = .98$) (Table 7.5). A nominal difference is noted between the Napier and Swift Creek phases ($\chi^2 = .76$, $df = 2$, $p = .70$) and between the Swift Creek and Woodstock phases ($\chi^2 = .96$, $df = 2$, $p = .70$).

7.3 Conclusion

Comparison of settlement location by sub-phase indicates a general preference for lowlands occurring in the Late Woodland period and continuing into the Mississippian period. The only potentially significant change in upland versus lowland preference is noted between the Napier and Early Woodstock phases. The comparison of site distances by stream order revealed a pattern in which settlements are located in close proximity to flood plains of all sizes throughout all phases. However, in terms of stream size preference, the variations noted between Swift Creek and Napier site locations as compared to Early Woodstock site locations clearly indicate a shift toward larger flood plains during the Emergent Mississippian Woodstock phase. A complete absence of variance in settlement preference between Late Woodstock and Early Etowah suggests that the established Mississippian pattern of settlement on flood plains of large rivers was well in place prior to the Mississippian Etowah period in north Georgia.

In the American Bottom, it has been demonstrated that Late Woodland groups were already intensively cultivating native crops and that Emergent Mississippian groups simply incorporated non-native cultigens such as maize into their existing horticultural systems (Rindos and Johannessen 1991). Late Woodland inhabitants of the Brasstown Valley of northern Georgia were also farming native cultigens. During the terminal Late Woodland and Early Etowah phases, the dietary role of these native cultigens diminished, and the occurrence of maize increased (Raymer and Bonhage-Freund 2000). Macrobotanical maize remains from seven Woodstock phase sites indicate that maize was a consistent component of the diet by the terminal Late Woodland period across the north Georgia study area (Hally 1970; Hally and Langford 1988:52; Stanyard and Baker

1992). The lack of a significant difference in upland versus lowland settlement preferences throughout the periods may be a reflection of the inclusion of sites of all sizes in the data set. However, it is also likely that this lack of settlement preference is due to the fact that Late Woodland groups were already dependent on agriculture through the cultivation of Eastern Agricultural Complex crops.

The data failed to show a significant difference in the distance of sites to the nearest river among the Late Woodland, Woodstock, and Mississippian periods. The distribution of Emergent Mississippian and Early Mississippian sites within the Tellico Reservoir in eastern Tennessee may provide some explanation. During the Martin Farm phase (A.D. 900 to A.D. 1000), settlements (n=17) in the Little Tennessee River valley were almost exclusively located within approximately 66.7 m (200 ft) of the flood plain and appear to represent small settlements (Schroedl et al. 1985). Conversely, during the Hiwassee Island phase (A.D. 1000 A.D. 1300), "residence sites tend to be distributed at greater distances from the river" (Schroedl et al. 1985:466), although these distances were not specified. Schroedl et al. (1985) offer two explanations for the shift: (1) the seasonal flooding of the Little Tennessee River would have made permanent settlement within close proximity to the river undesirable, and (2) the expansion of populations during the Mississippian period may have demanded that the nutrient rich, easily tillable soils that were replenished by annual floods be available for increased food production, notably maize, rather than settlement to meet the demands of increasing populations.

Therefore, a shift toward settlement at distances at least 100 m from the flood plain between the Napier and Swift Creek phases in the north Georgia study area may be associated with an increased production in native cultigens, which necessitated that the flood plains be open for cultivation. This pattern of settlement at least 100 m from the flood plain continued through the Woodstock and Etowah phases. The persistence of this pattern is likely due to the fact that maize was added to these native crop production systems during the Woodstock phase and grown throughout the Mississippian period, maintaining the need for open flood plains for cultivation.

Just south of the north Georgia study area in the Upper Oconee River Watershed of the Piedmont, Late Mississippian Lamar phase (A.D. 1350 to A.D. 1600) settlements appear to be evenly distributed between upland and lowland locations. The Upper Oconee River Watershed is comprised of Baldwin, Jones, Morgan, and Putnam counties. This settlement pattern contrasts with a preference toward lowland settlement noted above and challenges the argument that alluvial flood plains of rivers and streams were the best locations for the aboriginal cultivation of maize. However, this apparent lack of a preference toward lowland settlement in the Upper Oconee Watershed during the Late Mississippian period is explained by political factors, specifically the lessening of hostile boundary conditions. The demographic collapse in neighboring chiefdoms that resulted from the introduction of European diseases allowed for groups in the Oconee valley to disperse across the landscape since community defense, and therefore nucleated settlement, was no longer essential. Dispersed settlement enabled the exploitation of the previously underutilized upland soils by small household farming groups and the potential for population increases during the Late Lamar period (Kowalewski and Hatch 1991).

Nutrients in the upland soils are replenished through the recycling of forest vegetation, forming soils that can support maize cultivation. However, as demonstrated above, upland soils are generally shallow, more difficult to work, and subject to erosion. Abundant acreage of arable nonriverine or upland locations available for shifting cultivation practices artificially inflates the potential food energy of these areas (Kowalewski and Hatch 1991). When total cultivated acreage is compared, the upland soils, constituting 90% of the area, could support more people than the narrow meanders and shoals of the Oconee River. However, the deeper, annually replenished alluvial soils and the soils on surrounding gentle slopes, i.e. a slope of 6% or less, produce higher maize yields per acre than the steeper uplands. Under common management, the flood plains in the Upper Oconee River Watershed yield 18 bushels per acre, while the steep uplands yield only 7 bushels per acre (Payne 1965, 1976). As settlements that had "direct access to the broad flood plains and shoals of the large rivers" (Kowalewski and Hatch 1991:3) were excluded from the study, the resulting equal preference toward uplands in the Oconee province during the Late Mississippian period does not necessarily challenge the argument that alluvial flood plains of rivers and streams were preferable for maize cultivation. The results caution researchers to investigate more thoroughly upland settlement and the productive potential of extensive upland soils for intensive maize cultivation.

Large tracts of fertile bottom land enabled the settlement of greater numbers of people who could produce more crops and create surpluses that could be manipulated by chiefs to increase total production. Increased total production requires that "producers be located as near as possible to high quality resources" (Kowalewski and Hatch 1991:14). Thus, access to large tracts of arable soils was preferable during Mississippian period phases because these soils could easily support the intensive cultivation of maize (Milner and Oliver 1999). The intensive cultivation of maize in turn helped to perpetuate a centralized political system, by enabling elite individuals living in central mound centers to be supported by foodstuffs produced by populations in subordinate villages and farmsteads (Smith 1992, 1978). In association with the data indicating clustering of sites during the Woodstock phase, settlement along the flood plains of large rivers (Order Three and above) reflects the processes of subsistence intensification and political integration observed cross-culturally in the archaeological record as small-scale societies develop into complex societies (Johnson and Earle 2000) as exemplified in the southeastern United States by Mississippian chiefdoms.

CHAPTER 8

DEFINING WOODSTOCK SITE DISTRIBUTION AND CLUSTERING

The settlement pattern of Mississippian chiefdoms in northern Georgia and adjacent portions of Alabama and Tennessee is characterized by spatial site clustering (Anderson 1994; Hally 1993; Steponaitis 1978). Site clustering occurs because (1) competition between neighboring polities leads to the creation of uninhabited buffer zones between them, and (2) the administration of a polity is more efficient when distances between settlements and the administrative center are small. Locating the administrative center in the geographic center of the polity minimizes within-polity distances. Maximum distance between settlements and the administrative center are usually 20 km or less, which reflects the distance that can be easily traveled in a single day (Hally 1993).

Settlement clustering may also occur in societies lacking political centralization. Among the Mandan and Hidatsa of the Great Plains, each village was an independent political and economic unit, but was bound to its neighbors by the need for common defense against external enemies, a pool of eligible spouses, and a network for internal and external trade (Bowers 1950; Meyer 1977:12-17, 71-73). To the extent that such groups act as a unit against neighbors of a different identity, uninhabited buffer zones may be expected to develop between settlement clusters.

However, even though settlements may cluster in both non-centralized and centralized societies, the expression of clustering differs. In non-centralized societies, all settlements within a cluster should resemble each other in size and architectural complexity because all towns are politically equal. Conversely, politically centralized societies should exhibit a settlement hierarchy in which most settlements are of equal size and architectural complexity while the administrative center is larger and has monumental public architecture such as temple mounds.

8.1 Determining Site Clustering

The Georgia Archaeological Site File lists 205 sites designated as Woodstock. Of these, 152 sites had collections (a) that were comprised of <10 sherds, (b) that were not accessible to me because they were in private hands or permission to analyze the collections was not granted, or (c) whose curation location was unknown. An additional 10 collections consisted of only lithic artifacts or were lacking site location data (see Appendix A). Only 43 sites had substantial collections of sherds that were unweathered and relatively large in size.

I analyzed these 43 collections and, based on the relative frequencies of diamond and line block motifs and the number of border lines surrounding the diamond motif (see Chapter 4, section 4.3), I was able to assign 34 of them to either Early Woodstock (n=12) or Late Woodstock (n=17). Collections from nine sites were not clearly assignable to either subdivision. Based on the co-occurrence of limited amounts of Swift Creek, Napier, and Etowah ceramics in conjunction with the relative frequencies of the diamond and line block motifs, four sites (9CA18, 9FO16, 9LU7, 9TO48) appear to have been occupied during both Early and Late Woodstock. They are counted as being occupied during both sub-phases and bring the total number of Early Woodstock sites to 16 (Table 8.1), and the total number of Late Woodstock sites to 21 (Table 8.2).

Table 8.1 Ceramic analysis for Early Woodstock sites.

Site Number	Site Name	Woodstock Diamond[#]	Woodstock Line Block[#]	Other Woodstock	Swift Creek	Napier
9CA18[a]	Isaiah Hunter	9 (50%)	9 (50%)			
9CK2[b]	Woodstock	1717 (83%)	348 (17%)	Incised (262)	Late Comp (15)	
9CK4[b]	Horseshoe Bend	14 (100%)	0 (0%)			4
9CK5[b]	Wilbanks	32 (100%)	0 (0%)			1
9CK7[b]	Noonday Creek	49 (100%)	0 (0%)			
9CK9[a]	Hickory Log	115 (89.2%)	14 (10.8%)	Incised (2)	B-Complex (5)	6
9CK12[b]	Ingram	32 (64%)	18 (36%)	Incised (5)		4
9CK17[b]	Smithwick Creek	233 (61.6%)	145 (38.4%)			1
9CK20[b]	Humphrey	37 (94.9%)	2 (5.1%)	Incised (1)		4
9CK23[a]	Chambers	2 (66.7%)	1 (33.3%)	Check (22)		
9CK68[a]		23 (92%)	2 (8%)	Check (2)		
9CK72[a]		8 (88.9%)	1 (11.1%)	Check (14) Incised (1)		
9CK103[a]		39 (84.8%)	7 (15.2%)	Check (3)		1
9CK647[a]		25 (78.1%)	7 (21.9%)	Incised (2)		
9CO1[a]	Standing Peachtree	38 (76%)	12 (24%)		Late Comp (3)	
9DA255[a]		5 (62.5%)	3 (37.5%)			
9DA260[a]		21 (67.7%)	10 (32.3%)	Incised (3)		
9DO1[a]	Vandiver	2 (100%)	0 (0%)		Late Comp (3)	
9DW1[b]	High Tower	100%	0%			
9FL193[b]	Whitehead Farm I	101 (96.2%)	4 (3.8%)	Incised (33)		
9FN4[b]	Noontootla Creek	100%	0%		B-Complex (2)	
9FO1[a]	Strickland Ferry	24 (96%)	1 (4%)		B-Complex (2)	1
9FO3[b]	Settingdown Creek	48 (82.8%)	10 (17.2)%			
9FO12[b]	Caldwell 41A	5 (100%)	0 (0%)			
9FO16[a]	Summerour	5 (62.5%)	3 (37.5%)		Late Comp (2)	
9FO29[a]	Terry's Ferry	8 (80%)	2 (20%)			
9FU2[b]	Captain Johns	88 (97.8%)	2 (1.1%)			
9FU3[b]		94.5%	5.5%			2
9GW209[b]		148 (73.6%)	53 (26.4%)			
9GW497[b]		5 (83.3%)	1 (16.7%)			9
9HL17[b]	Caldwell 41	29 (80.6%)	7 (19.4%)			
9HL32[b]	Caldwell 57	5 (100%)	0 (0%)		B-Complex (7)	
9LU7[a]	Chestatee	85 (72.6%)	32 (27.3%)	Check (2) Incised (4)	8	1
9OG306[a]		5 (62.5%)	3 (37.5%)			
9PI3[b]	Tate	30 (81.8%)	7 (18.9%)	Incised (1)	Late Comp (2)	
9RO53[b]	Banks B	4 (100%)	0 (0%)		UID Comp (84)	52
9TO48[b]		5 (55.6%)	4 (44.4%)	UID (18)	15	
9WH5[b]	Lumsden	67 (81.7%)	15 (18.3%)		Late Comp (1)	2
9WN5[b]		35 (92.1%)	3 (7.9%)		UID Comp (1)	1

[a] Numbers based on reanalysis of collections.
[b] Percentages and counts derived from archaeological reports, site forms, and manuscripts.
[#] Percentages denote the relative frequencies of Woodstock Diamond and Woodstock Line Block motifs.

Table 8.2 Ceramic analysis for Late Woodstock sites.

Site Number	Site Name	Woodstock Diamond[#]	Woodstock Line Block[#]	Other Woodstock	Early Etowah
9BA17[a]	Grove Creek	4 (57.1%)	3 (42.86%)		
9BR12[a]	Pumpkin Vine	1 (25%)	3 (75%)		
9BR139[a]	Stamp Creek	98 (59%)	68 (41%)		
9BR140[a]	Caldwell BR71	34 (60.7%)	22 (39.3%)	Check (23)	1
9CA18[a]	Isaiah Hunter	9 (50%)	9 (50%)		
9CK16[a]		7 (43.7%)	9 (52.3%)		
9CK26[a, b]	Sixes Old Town	18 (62.1%)	11 (37.9%)	Incised (1)	9
9DA259[a]		3 (50%)	3 (50%)		
9FN40[b]	Davenport	0%	100%		
9FO16[a]	Summerour	5 (62.5%)	3 (37.5%)		
9FO208[a]	Settles Pasture	2 (28.6%)	5 (71.4%)		
9FO209[a]	Settles	5 (35.7%)	9 (64.3%)		
9FO256[a]		2 (50%)	2 (50%)		
9GO4[a]	Thompson	131 (67.2%)	64 (32.8%)	Check (12) Incised (4)	3
9GW70[a]	Rivermoore	533 (49.8%)	538 (50.2%)	Incised (5)	19
9GW193[b]		3 (50%)	3 (50%)		
9GW494[b]		11 (61.1%)	7 (38.9%)		
9GW495[a]		32 (33%)	65 (67%)		13
9HL16[b]	Caldwell 40	4 (28.6%)	10 (71.4%)		1
9HL36[b]	Caldwell 61	0 (0%)	39 (100%)		16
9HL45[b]	Caldwell 70	10 (23.3%)	33 (76.7%)		4
9HL366[b]		0 (0%)	5 (100%)		
9JK141[a]		30 (50%)	30 (50%)		
9LU7[a]	Chestatee	85 (72.6%)	32 (27.3%)	Check (2) Incised (4)	8
9MU8[a]		46 (68.7%)	21 (31.3%)	Check (4)	2
9MU103[a]	Potts' Tract	247 (67.5%)	119 (32.5%)	Check (9) Incised (2)	13
9RA88[a]		4 (33.3%)	8 (66.7%)	Incised (1)	
9ST3[a]	Estatoe	17 (43.6%)	22 (56.4%)		7
9TO2[b]	Brasstown Creek			UID Comp (1)	5
9TO11[b]	Indian Trail	97 (40.6%)	142 (59.4%)	Check (4) Cordmarked (3) Incised (2)	
9TO48[b]		5 (55.6%)	4 (44.4%)	UID Comp (18)	30

[a] Numbers based on reanalysis of collections.
[b] Percentages, counts, and presence derived from archaeological reports, site forms, and manuscripts.
[#] Percentages denote the relative frequencies of Woodstock Diamond and Woodstock Line Block motifs.

To increase the data set, I consulted original site forms, manuscripts, and reports that reported ceramic data for 145 of the remaining 162 Woodstock sites. 42 sites had collections that were described in sufficient detail to enable me to assign 22 sites to Early Woodstock and 10 sites to Late Woodstock. The inclusion of these sites brought the Early Woodstock total to 39 sites (Table 8.1) and the Late Woodstock total to 31 sites (Table 8.2). The larger samples enabled me to better assess clustering, as I could feel confident that the existence of empty areas between clusters was not simply due to a lack of data. I plotted the distribution of sites for each sub-phase in ArcView to determine whether contemporary sites fell into clusters.

Mississippian habitation sites in Georgia, eastern Alabama, and eastern Tennessee tend to be distributed within well-defined clusters around mound centers. Comparison of the straight-line distances between mound sites demonstrates a bimodal distribution of intersite distances at less than 18 km or greater than 32 km (Hally 1993:103). Hally (1993) asserts that mound sites separated by less than 18 km represent the administrative centers of a single complex chiefdom while the mound sites separated by more than 32 km represent different individual polities.

Archaeological survey evidence from the Tennessee and Coosa River drainages in northwest Georgia, southeastern Tennessee, and northeastern Alabama indicates that mid-sixteenth century site clusters in the area consisted of four to seven large habitation sites and at least one mound site and ranged in maximum dimension between 11 and 24 km (Hally 1993; Hally et al. 1990). The distances between the mound sites in neighboring clusters averaged 50 km. Assuming that these mound sites represented administrative centers of independent chiefdoms, "polities could have utilized, controlled, and/or claimed territories as large as 40-55 km in diameter" (Hally 1993:104), a portion of which may have served as a buffer zone or wild food reserve (Anderson 1994). The Moundville chiefdom exhibits a similar pattern, with sites clustering within a 30 to 50 km area (Welch 1998). This pattern is also demonstrated in "historically and archaeologically documented chiefdoms" (Welch 1998:134) throughout the world that are defined by the distance a person can travel by foot in a single day (approximately 56 km) (Spencer 1982).

There are no known Woodstock phase mound sites. In the absence of such markers, we can look for spatial clusters of Woodstock habitation sites that have a maximum dimension of 40 km or less. According to Williams and Shapiro (1996:148), "the density and distribution of nonmound sites" may in fact be a better indicator of regional integration than the distribution of mound centers because the former more accurately define "rural expansion and the formation of buffer zones." To this end I assigned sites for which I had motif counts to Early (Figure 8.1) or Late (Figure 8.2) Woodstock clusters based on the co-occurrence of at least three sites within a 40 km circle. I then assigned Woodstock sites that were inaccessible for motif analysis to these clusters based on their proximity to cluster members. The resulting site clusters are illustrated in Figures 8.3 and 8.4.

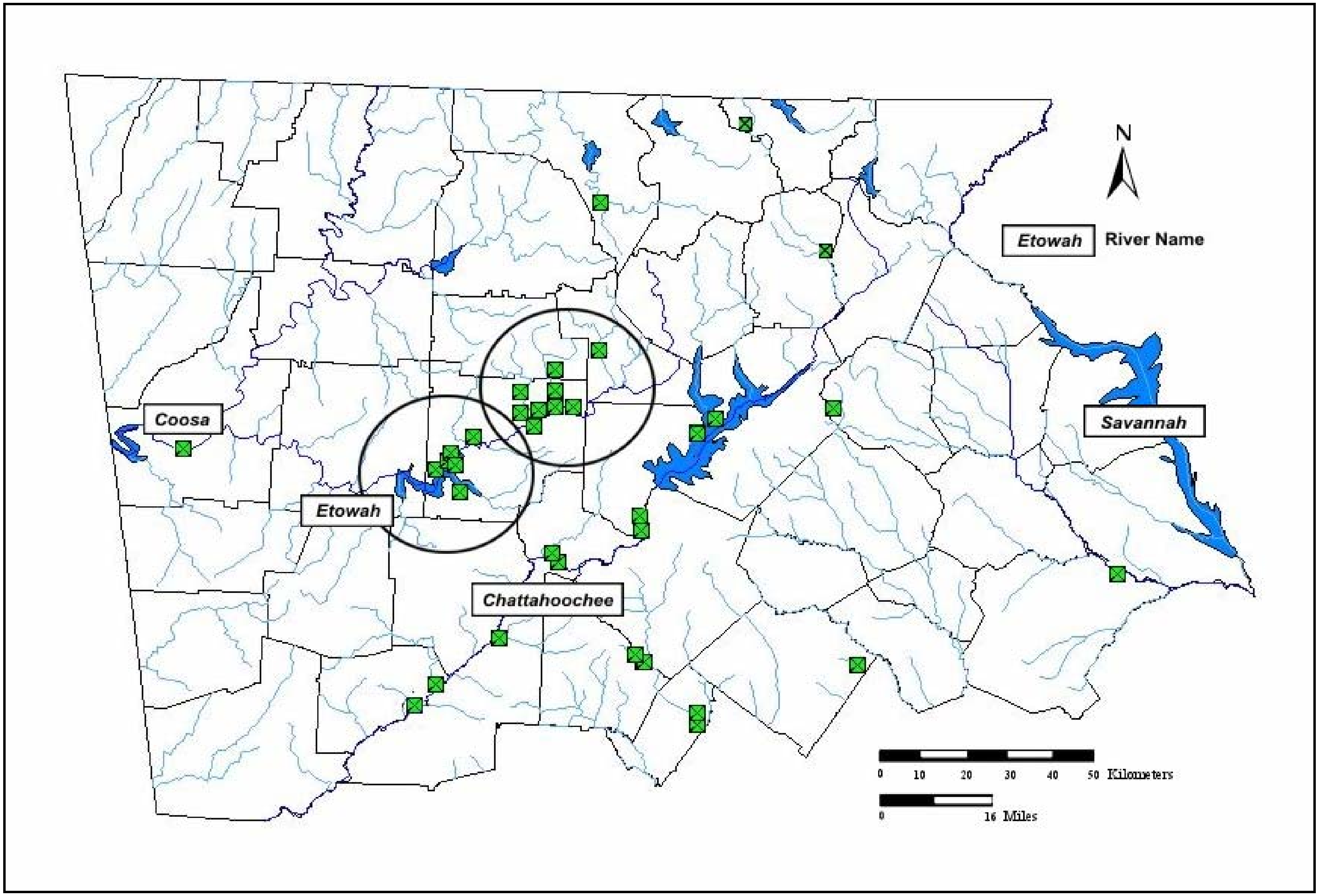

Figure 8.1 Early Woodstock site clusters based on analysis and on counts derived from reports and manuscripts.

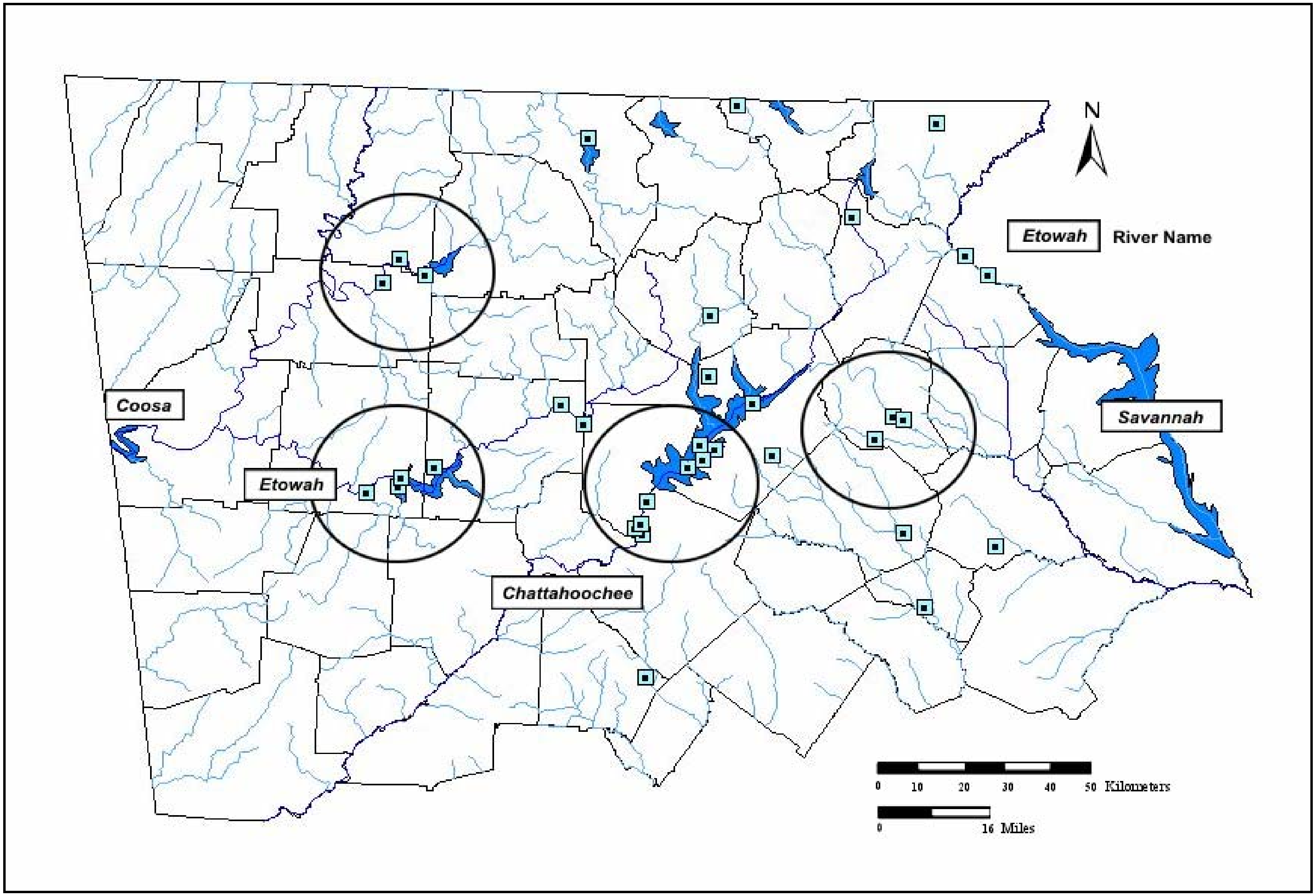

Figure 8.2 Late Woodstock site clusters based on analysis and on counts derived from reports and manuscripts.

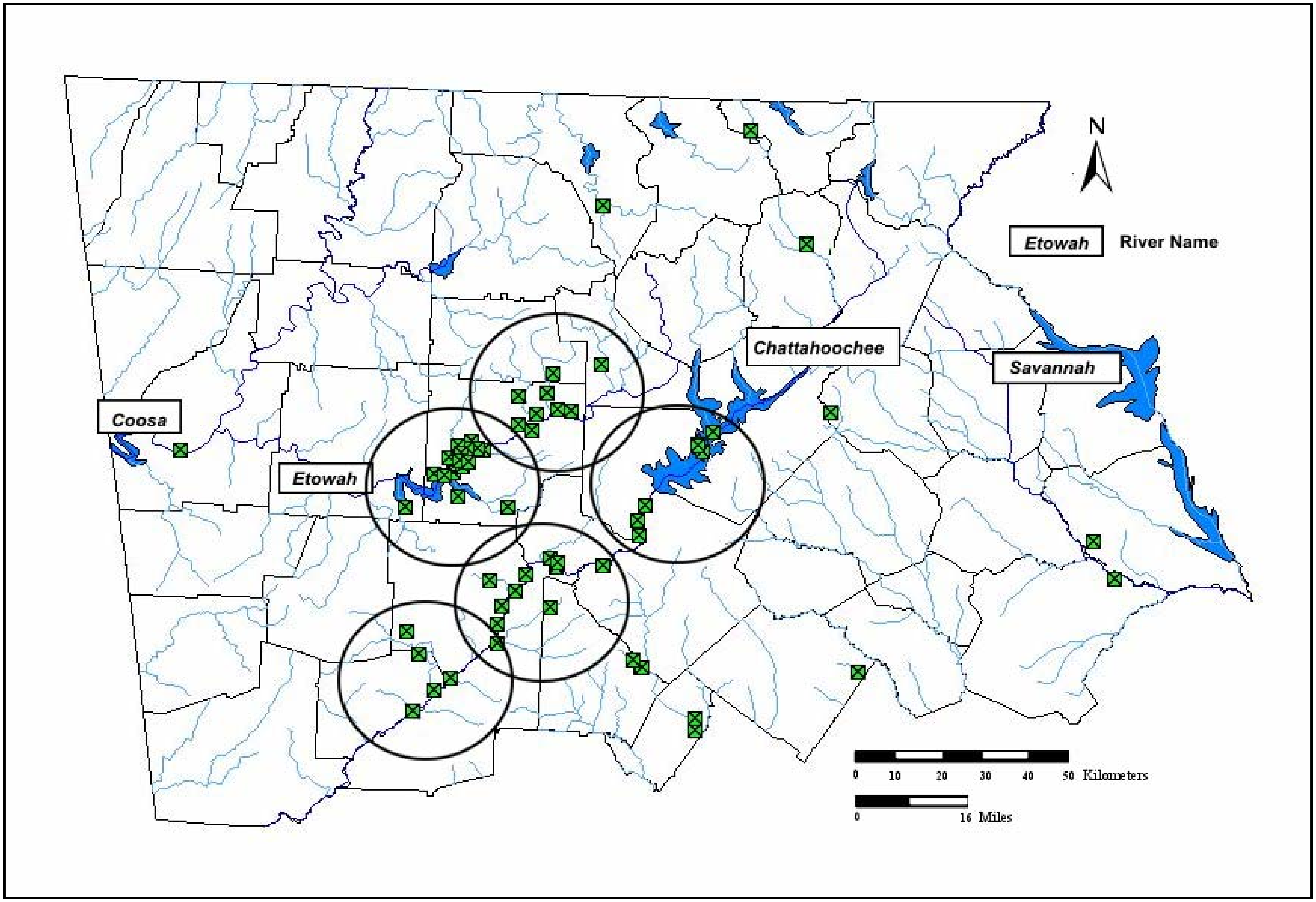

Figure 8.3 Early Woodstock clusters based on analysis, written sources, and proximity to cluster members.

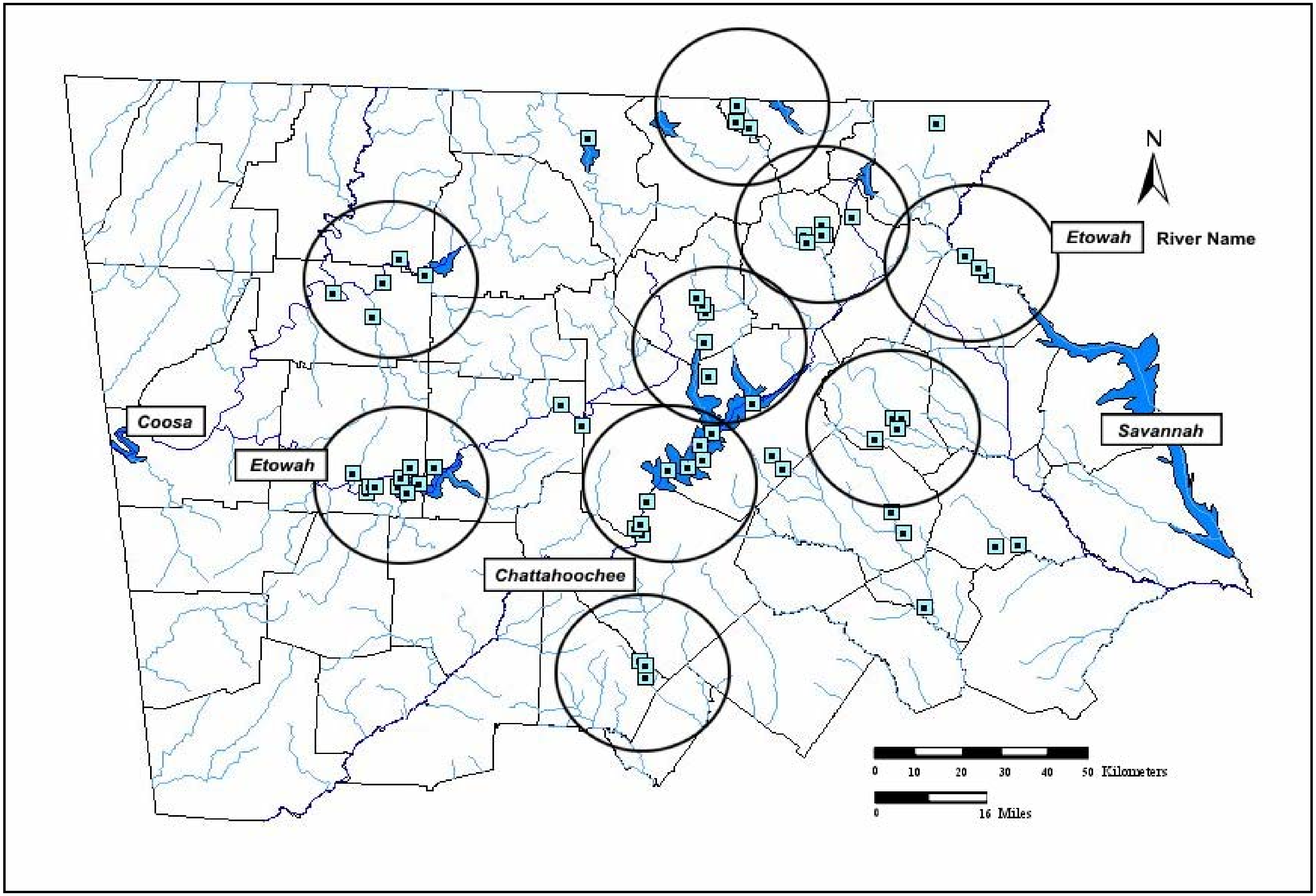

Figure 8.4 Late Woodstock clusters based on analysis, written sources, and proximity to cluster members.

There are 167 sites recorded as Etowah in the Georgia Archaeological Site File. Of these, 65 sites had collections that either were listed as having <10 sherds or were not accessible to me because they were in private hands, their curation location was unknown, or permission to analyze the collections was not granted. An additional 6 collections consisted of only lithic artifacts or were lacking site location data. In addition to analysis, consultation of original site forms, manuscripts, and reports that described the ceramic collections in sufficient detail yielded information for 78 of the remaining 96 Etowah sites.

I was able to assign 32 sites to either Early Etowah (n=10) or Late Etowah (n=20). Line block and ladder-based diamond motifs constitute Early Etowah complicated stamping, while Late Etowah is characterized by the filfot cross, the number 9, and barred diamond or oval designs (King 2001; Hally and Rudolph 1988). Based on the co-occurrence of Early Etowah ladder-based diamond and line block motifs in conjunction with Late Etowah filfot cross and number 9 motifs, two sites (9CK20 and 9WH19) appear to have been occupied during both Early and Late Etowah. They are counted as being occupied during both sub-phases, bringing the number of Early Etowah sites to 12 and the number of Late Etowah sites to 22.

The addition of Early and Late Etowah mound centers as determined by Hally (1996) based on stratigrahic ceramic collections, brings the total number of Early Etowah sites to 23 (Table 8.3 and Figure 8.5), and the total number of Late Etowah sites to 31 (Table 8.4 and Figure 8.6). I plotted the distribution of sites for each sub-phase in ArcView to determine whether contemporary sites fell into clusters. I then assigned Etowah sites that were inaccessible for motif analysis to these clusters based on their proximity to cluster members. The resulting site clusters are illustrated in Figures 8.5 and 8.6.

Table 8.3 Ceramic analysis for Early Etowah sites.

Site	**Site Name**	**Early Etowah**	**Woodstock Diamond[#]**	**Woodstock Line Block[#]**	**UID Woodstock**
9BR1 [b *]	Etowah	369	2 (100%)	0 (%)	
9BR12 [a]	Pumpkin Vine	3	2 (100%)	0 (%)	
9BR40 [c]					
9CK4 [c]	Horseshoe Bend				
9CK5 [c]	Wilbanks				
9CK19 [b]	Coker	6	--	--	19
9CK20 [b]	Humphrey	16	37 (94.9%)	2 (5.1%)	
9CK26 [a, b]	Sixes Old Town	9	18 (62.1%)	11 (37.9%)	
9EB1 [b]		26	7 (100%)	0 (0%)	
9FO3 [b]	Settingdown Creek	2	48 (82.8%)	10 (17.2%)	
9FO4 [c]	Thomas				
9FO12 [b]	Caldwell 41A	2	5 (100%)	0 (0%)	
9FO25 [b]	Caldwell 48A	2	--	--	12
9HL38 [b]	Caldwell 63	7	--	--	
9LU7 [a]	Chestatee	8	85 (72.6%)	32 (27.3%)	
9MU100 [c]	Sixtoe Field				
9RA3 [c]					
9TO48 [b]		30	5 (55.6%)	4 (44.4%)	18
9WH2 [c]	Eastwood				
9WH3 [c]	Nacoochee				
9WH19 [b]	Burrong	91	--	--	5
9WH32 [b]		2	1 (100%)	0 (0%)	

[a] Numbers based on reanalysis of collections.
[b] Percentages, counts, and presence derived from archaeological reports, site forms, and manuscripts.
[c] Early Etowah mound centers as assigned by Hally 1996:Figures 6.1 and 6.2.
[*] Counts from Mound B Saucers 1-4 only.
[#] Percentages denote the relative frequencies of Woodstock Diamond and Woodstock Line Block motifs.

Table 8.4 Ceramic analysis for Late Etowah sites.

Site	Site Name	Late Etowah#	Early Etowah#	Woodstock
9BR1 [b *]	Etowah	354 (49%)	369 (51%)	2
9BR41 [b]	Winneman	2 (67%)	1 (33%)	1
9BR139 [a]	Caldwell BR60	83 (100%)	0 (0%)	166
9CK1 [c]				
9CK4 [b]	Horseshoe Bend	250 (77.4%)	73 (22.6%)	14
9CK5 [b]	Wilbanks	16 (100%)	0 (0%)	32
9CK15 [b]	Cline Farm	1 (100%)	0 (0%)	
9CK17 [b]	Smithwick Creek	40 (81.6%)	9 (18.4%)	378
9CK20 [b]	Humphrey	23 (59%)	16 (41%)	39
9CK129 [b]		5 (100%)	0 (0%)	2
9DO1 [c]	Annewakee Creek			
9DW3 [b]	Palmer Creek	10 (100%)	0 (0%)	
9EB1 [b]		24 (48%)	26 (52%)	7
9FO4 [b]	Thomas	12 (70.6%)	5 (29.4%)	
9FU2 [b]	Captain Johns	4 (80%)	1 (20%)	90
9GO8 [c]				
9HL17 [b]	Caldwell 41	42 (100%)	0 (0%)	52
9PI3 [b]	Tate	157 (80.5%)	38 (19.5%)	37
9RA3 [c]				
9ST1 [c]	Tugalo Mound			
9ST14 [b]		7 (100%)	0 (0%)	
9WH2 [b]	Eastwood	304 (100%)	0 (0%)	
9WH3 [b]	Nacoochee	99 (97.1%)	3 (2.9%)	
9WH5 [b]	Lumsden	240 (92.3%)	20 (7.7%)	
9WH6 [b]	Williams	3 (100%)	0 (0%)	
9WH15 [b]	Sutton	6 (100%)	0 (0%)	
9WH18 [b]	New	14 (66.7%)	7 (33.3%)	
9WH19 [b]	Burrong	96 (51.3%)	91 (48.7%)	
9WH29 [b]	Will White	33 (89.2%)	4 (10.8%)	

[a] Numbers based on reanalysis of collections.
[b] Percentages, counts, and presence derived from archaeological reports, site forms, and manuscripts.
[c] Early Etowah mound centers as assigned by Hally 1996:Figures 6.1 and 6.2.
[*] Counts from Mound B Saucers 1-4 only.
[#] Percentages denote only the relative frequencies of Early Etowah and Late Etowah motifs.

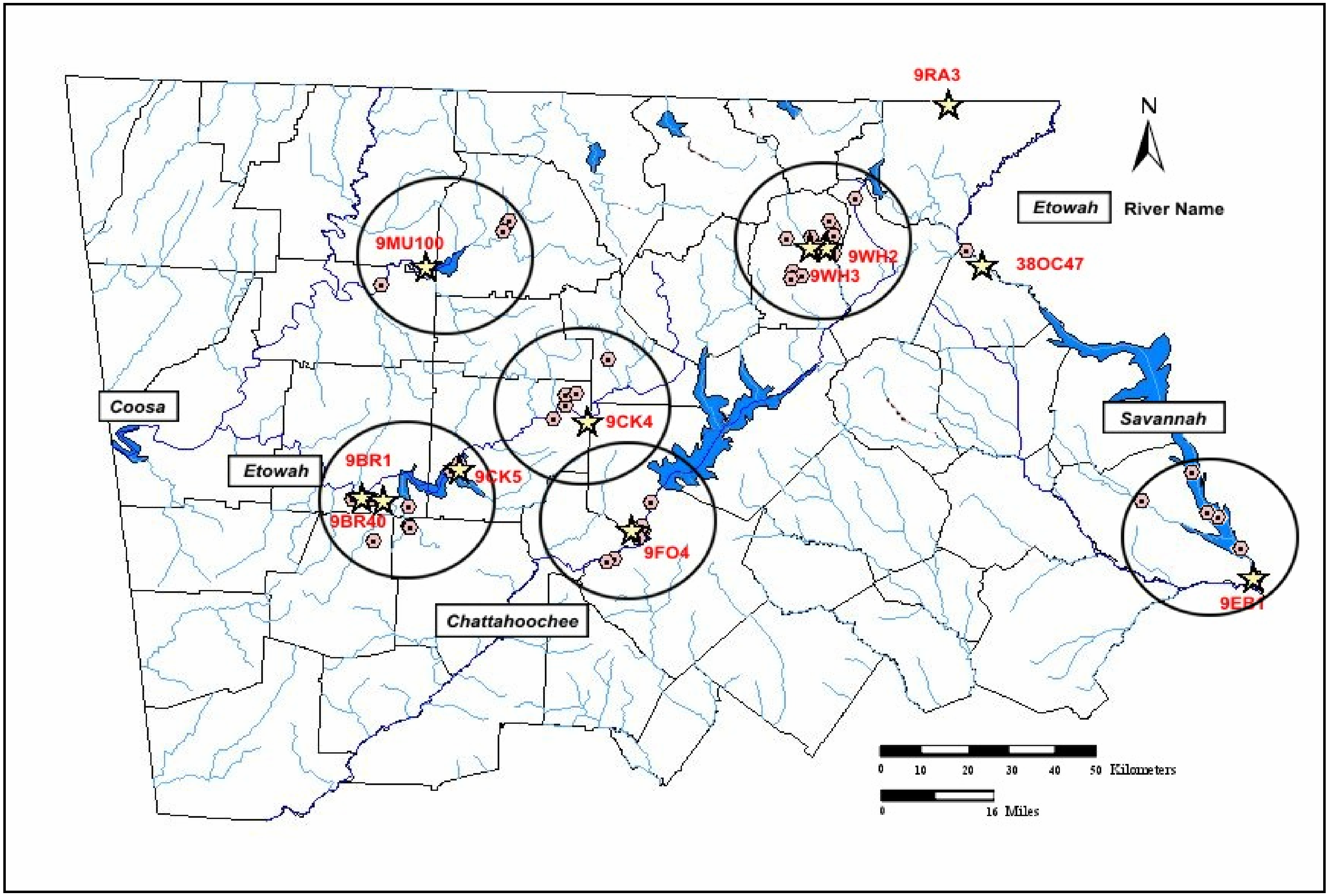

Figure 8.5 Early Etowah site clusters based on analysis, written sources, and proximity to cluster members. Stars denote mound centers (based on Hally 1996:Figures 6.1 and 6.2).

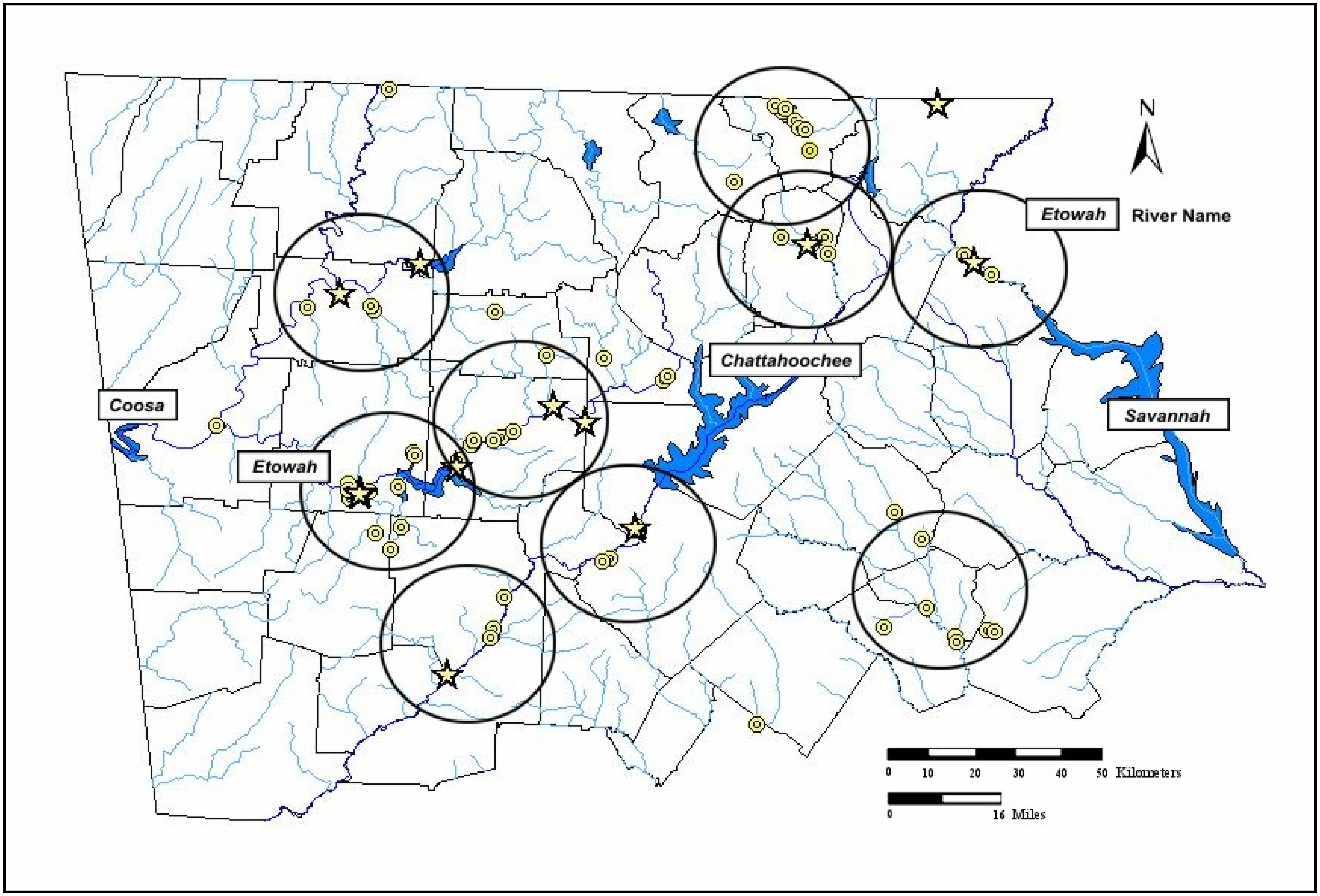

Figure 8.6 Late Etowah site clusters based on analysis, written sources, and proximity to cluster members. Stars denote mound centers (based on Hally 1996:Figures 6.1 and 6.2).

To test the validity of the clusters determined on the basis of co-occurrence within a 40 km circle, I performed a nearest neighbor analysis. Nearest neighbor analysis compares the observed average distances between neighboring points and the distances of a known pattern (Lee and Wong 2000). Sites are considered to be clustered if the observed average distance between nearest neighbors is less than the distance expected in a random pattern.

To test for clustering, I calculated the *R* statistic for randomness $R = \frac{r_{obs}}{r_{exp}}$ by dividing the observed average distance (r_{obs}) between nearest neighbors by the expected average distance (r_{exp}) between neighbors (Table 8.5). I measured distances for the nearest and second nearest neighbors for all sites I had mapped for the Early Woodstock and Late Woodstock sub-phases, and the sites designated as Swift Creek and Napier in the Georgia Archaeological Site File database. Observed average distance was calculated by averaging the distances for nearest (N1) and second nearest (N2) neighbor according to phase.

Table 8.5 Nearest neighbor statistics by phase.

Phase	***R* value**		**Standard Error**	***Z* score (Z_R)**	
	N1[a]	**N2[a]**	**(SE_r)**	**N1[a]**	**N2[a]**
Napier[c]	0.67	1.06	1.20	-4.19	0.73
Swift Creek[c]	0.78	1.25	.62	-3.77	4.33
Early Woodstock[b]	0.65	0.84	1.03	-4.73	-2.80
Late Woodstock[b]	0.53	0.76	.87	-6.90	-3.47

[a] N1 = nearest neighbor; N2 = second nearest neighbor.
[b] Based on Early (n=39) and Late Woodstock (n=31) sites determined from analysis and written sources.
[c] Based on Napier (n=43) and Swift Creek (n=83) sites recorded in the GASF for the study area.

The expected average distance $r_{\exp} = \frac{1}{2\sqrt{n/A}}$ was calculated for each phase, with n representing the number of sites and A representing the area (38,828 km) of the 44 county north Georgia study region. When $R = 0$, points are completely clustered; when $R = 1$, point distribution is random. Values greater than $R = 2$ indicate a dispersed pattern. Thus, "clustered patterns are associated with smaller R values ($r_{\text{obs}} < r_{\exp}$)" (Lee and Wong 2000:74).

The standard error (SE_r) assesses the likelihood that the difference between observed average distances and expected average distances is due purely to chance. A relatively large difference compared to the standard error indicates that the difference is statistically significant and is not the result of chance. To determine the statistical significance of the difference between observed and expected average distances as compared to the standard error, I calculated standardized Z_R scores $Z_R = \frac{r_{\text{obs}} - r_{\exp}}{SE_r}$ for each phase (Table 8.5). Z_R scores that are greater than 1.96 or less than -1.96 would indicate that any tendency for sites to cluster is statistically significant (at $p = .05$).

It is possible that the R values returned for each of the phases may be as much the result of the locations where extensive archaeological survey has been conducted (e.g. reservoirs) as they are the result of a real tendency for sites to cluster. However, as such large-scale survey projects typically locate sites regardless of time period, nearest neighbor analysis is still applicable and can provide some useful insights when site distributions for different phases are compared. Although an irregular distribution of survey areas may be contributing to lower R values for nearest neighboring sites overall, higher R values suggest that Swift Creek and Napier sites are more widely distributed across the survey areas, while Early and Late Woodstock sites occur more densely in a smaller number of survey areas. This assertion is upheld by the higher *R* values (R > 1) for the second nearest neighbor distances for both the Napier and Swift Creek phases.

To further assess the tendency of sites to be either widely distributed across the landscape or clustered, I plotted the distance (in km) from each site to the nearest through the fourth nearest neighbor by phase (Figure 8.7 and Table 8.6). For all phases, the nearest neighbor is located within 10 km, with the Late Woodstock phase distances being very similar at 6.9 km. A greater difference appears when the distance to the second closest neighbor is compared. Early and Late Woodstock phase sites tend to be located within 11 km of the second nearest neighbor, while Swift Creek phase sites are located at a distance of 13.5 km, and Napier sites are located at a distance of almost 16 km.

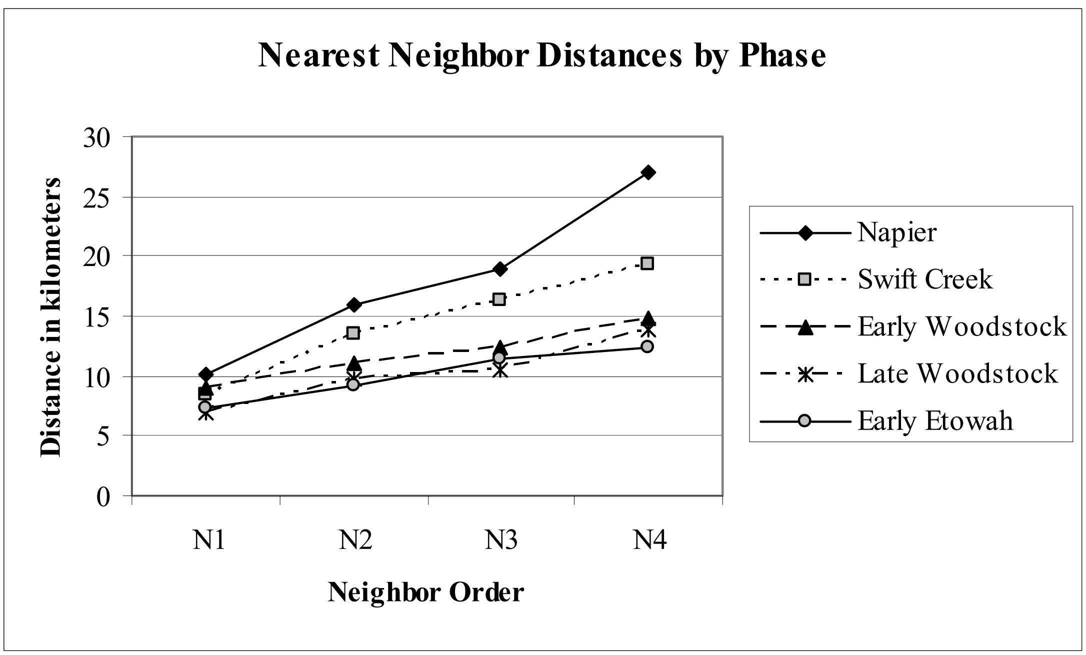

Figure 8.7 Nearest and next nearest neighbor distances by phase.

The divergence from the patterns exhibited by the Early and Late Woodstock phase distributions becomes more notable when third (N3) and fourth (N4) nearest neighbor distances are compared. While the distances between each successive neighbor increases for all phases, the distances for Early and Late Woodstock tend to cluster within a tight (2.5 km) size range. The greater distances noted for the Napier and third and fourth nearest neighbors indicate that while sites may appear to cluster on a local scale (i.e. first and second nearest neighbors), on a larger, regional scale, sites are actually dispersed during this phase. The data indicate that sites may have a slight tendency to cluster during the Swift Creek and Napier phases. Successive Early and Late Woodstock sub-phases, however, indicate that the tendency for sites to cluster becomes stronger through time.

Table 8.6 Nearest neighbor distances by phase (in kilometers).

	Nearest	Second Nearest	Third Nearest	Fourth Nearest
Napier	10	15.9	19	27
Swift Creek	8.4	13.5	16.3	19.4
Early Woodstock	9	11	12.4	14.9
Late Woodstock	6.9	9.8	10.5	13.8

Early Woodstock sites (see Figure 8.3) appear to be located primarily along major rivers. Two clusters are evident on the Etowah River, while three clusters are apparent on the Chattahoochee River to the southeast. The southwestern cluster occurs in the same location as the Napier phase Annewakee Creek (9DO2) mound site in Douglas County. Nearest neighbor analysis indicates that the Early Woodstock sites are somewhat clustered (R = 0.65 and R = 0.84) and that this clustering is not the result of chance ($Z_R = -4.73$, $p < .0001$ and $Z_R = -2.80$, $p < .0001$).

Conversely, Late Woodstock sites (see Figure 8.4) cover a more extensive geographic area and exhibit clustering in several additional locations in the north Georgia study area. Settlement is located further westward on the Etowah River, in the area where the Mississippian Etowah chiefdom began to arise at the type site (9BR1) during the following 100 years. Settlement occurs further northward on the Chattahoochee River into Hall County. A large cluster of sites surrounds the Summerour Mound (9FO16); mound construction may date to the Woodstock phase. New clusters also occur on the Hiawassee River at the Tennessee line, on the Savannah River at the South Carolina line, and on the Broad River in Clark County, Georgia. Nearest neighbor analysis confirms that Late Woodstock sites are more clustered (R = .53 and R = .76) than Early Woodstock sites and that this clustering also is not the result of chance (Z_R = -6.90, $p < .0001$ and Z_R = -3.47, $p < .0001$).

The Swift Creek phase has not been divided into early and late components, limiting the value of comparison between the Swift Creek and Woodstock phase site distributions (Figure 8.8). With this limitation in mind, we note that Woodstock sites tend to occur in areas in which Swift Creek sites were located. Nearest neighbor analysis suggests that Swift Creek sites exhibit some clustering (R = .78) and that this initial clustering is unlikely to be purely the result of chance (Z_R = -3.77, p = .0001). The second nearest neighbor statistic (R = 1.25, Z_R = 4.33, p = .0001) indicates that settlements are even more widely dispersed than would be expected in a random distribution.

Areas that become the locations of rather densely occupied Woodstock clusters appear to have also occupied during the Napier phase (Figure 8.9), although somewhat minimally. The small number of Napier sites located in north Georgia, however, makes a

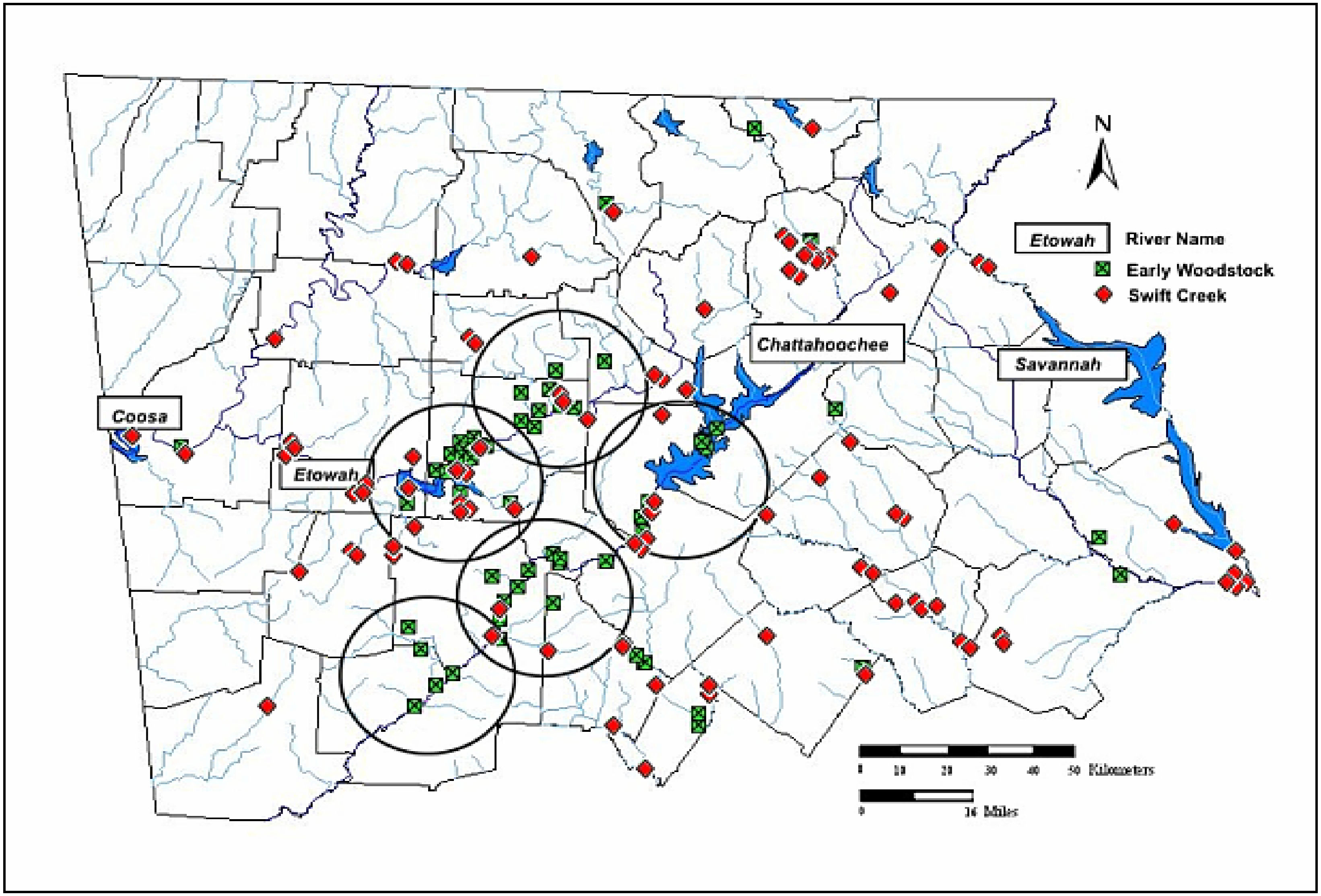

Figure 8.8 Distribution of Swift Creek (diamonds) and Early Woodstock (squares) sites (see Figure 8.3).

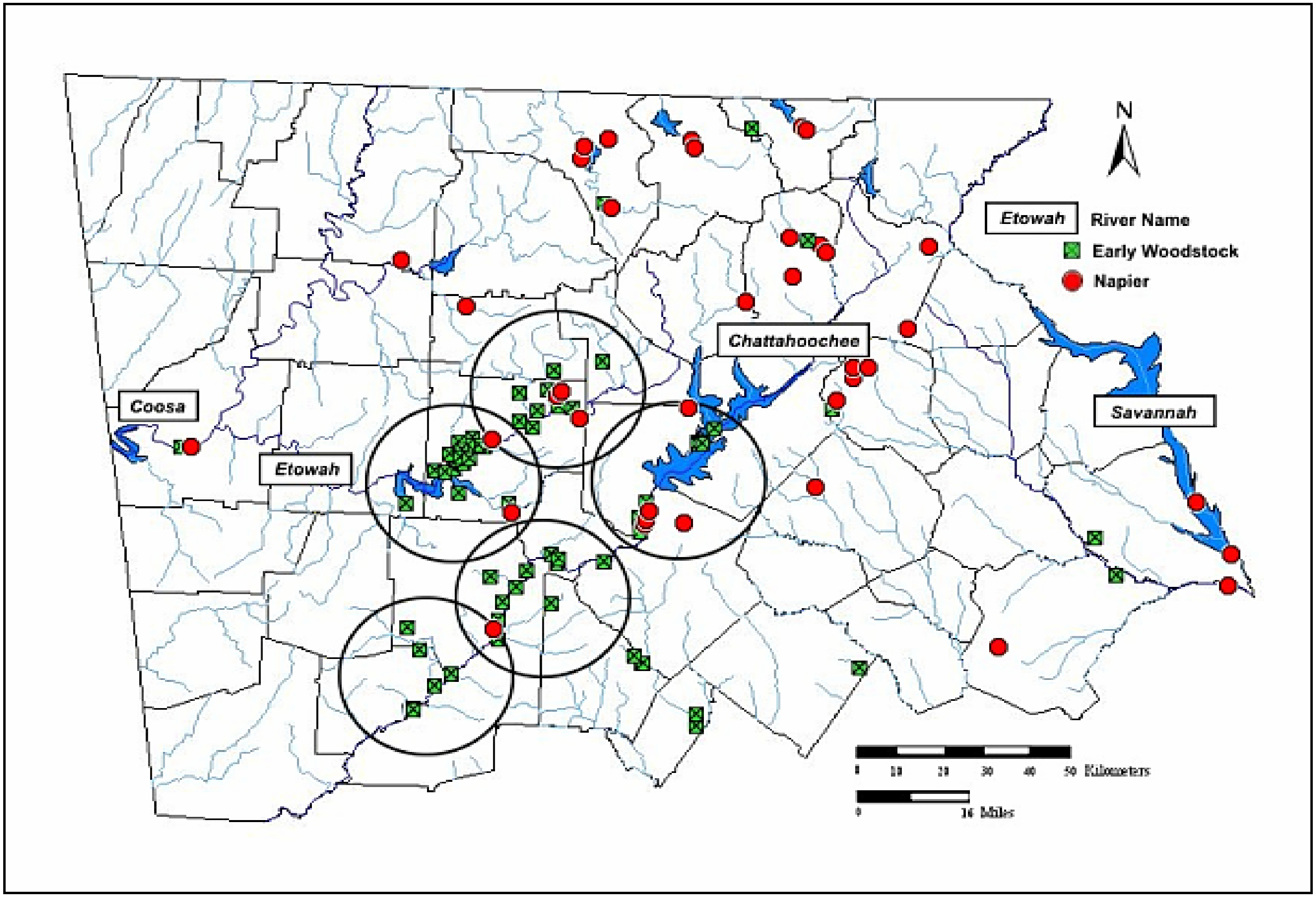

Figure 8.9 Distribution of Napier (circles) and Early Woodstock (squares) sites (see Figure 8.3).

robust comparison of site distributions difficult. Considering the current data set, analysis suggests that Napier sites exhibit some clustering (R = .67), which is unlikely due purely to chance (Z_R = -4.19, p = .0001). Again, the second nearest neighbor statistic (R = 1.06, Z_R = 0.73) indicates that Napier sites are more randomly distributed, and thus more widely dispersed, than Woodstock sites.

Cycling of sites and clusters rather than continuous, uninterrupted occupation has been suggested for the Mississippian Etowah phase, as "chiefdoms in northern Georgia typically endured for periods of less than 100 years" (Hally 1996:113). Seemingly contrary to the Mississippian cycling model proposed for the Early and Late Etowah phases, Early (see Figure 8.5) and Late Etowah clusters (see Figure 8.6) appear to overlap in a number of locations. Six mound centers appear to have occupied during both Etowah phases. However, at five of these mound sites, there is no stratigraphic evidence for when mound construction and use occurred (Hally 1996). As a result, we cannot say when each mound site functioned as an administrative center for a chiefdom: only during Early Etowah, only during Late Etowah, or during both phases.

Consideration of cluster locations in conjunction with mound center data reveals that three areas with Early Etowah site clusters and mound construction continue to have site clusters and mound building in the Late Etowah phase (Figure 8.10). These clusters are located around the Nacoochee Mound site on the Chattahoochee River in White county, further southward along the Chattahoochee River below Lake Lanier, and around the Etowah mound site on the Etowah River in Bartow County. Three Late Etowah clusters arise in areas where Early Etowah settlement appears to have been absent: the southern portion of the Chattahoochee River where the Napier phase Annewakee Creek mound

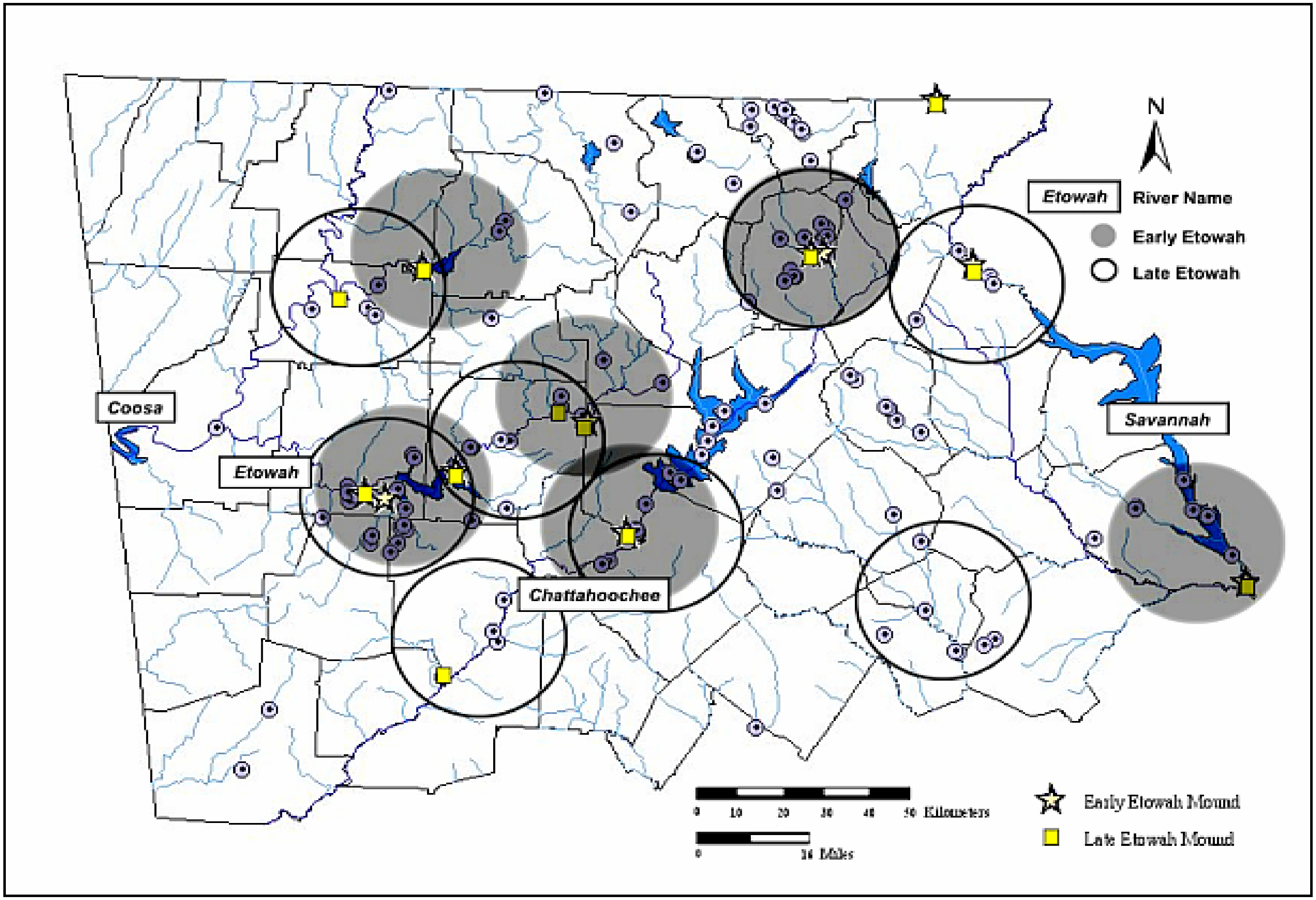

Figure 8.10 Distribution of Early and Late Etowah clusters. Stars denote mound centers (based on Hally 1996:Figures 6.1 and 6.2).

site, an area in the southeastern part of the study area that was vacant during all but the Swift Creek phase, and an area along the Savannah River on the South Carolina border. Additionally, the Early Etowah cluster further south on the Savannah River appears to have been abandoned by Late Etowah.

Following the Mississippian chiefdom cycling model asserted by Hally, one would expect areas where Late Woodstock clusters occur to be abandoned during the Early Etowah phase. Comparison of site clusters for the two phases (Figure 8.11) reveals that a number of clusters in both phases overlap. Two clusters overlap completely: around the Etowah mound site on the Etowah River and around the Nacoochee Mound site on the northern reaches of the Chattahoochee River. However, four Late Woodstock clusters appear to have been abandoned during the Early Etowah phase. Additionally, during the Early Etowah phase, previously vacant areas on the South Carolina line along the Savannah River and west of Lake Lanier on the northern reaches of the Etowah River become centers.

8.2 Summary and Conclusions

Comparison of Woodstock site distributions to the preceding Swift Creek and Napier phases and the succeeding Etowah phase reveals interesting changes in site clustering through time. Napier and Woodstock sites tend to be located in different areas, while Swift Creek and Woodstock sites share somewhat similar distributions across the north Georgia area. Early Woodstock clusters (Figure 8.12) are centrally located in north Georgia on the Etowah and Chattahoochee Rivers. Late Woodstock (Figure 8.12)

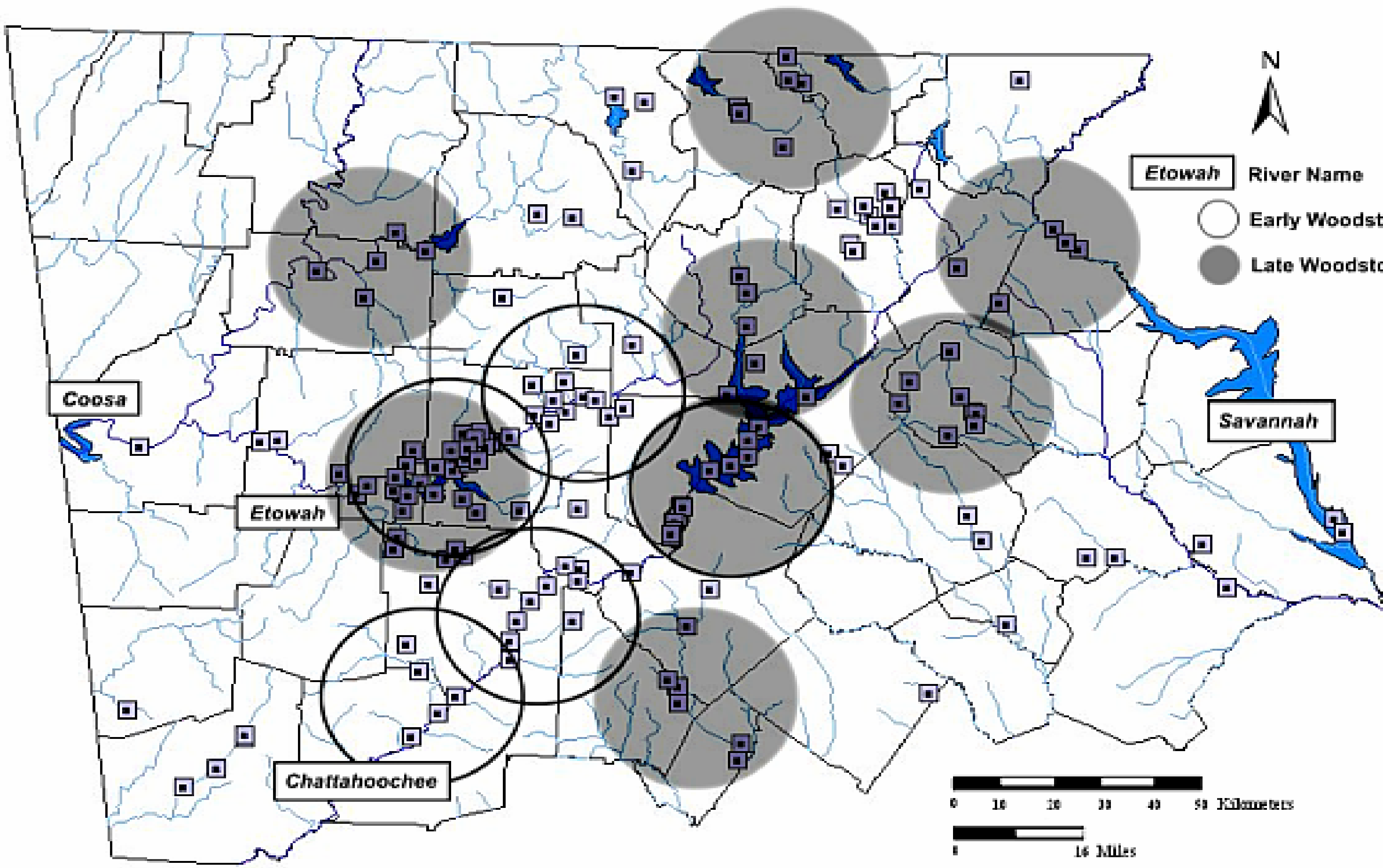

Figure 8.11 Distribution of Early and Late Woodstock clusters. Stars denote mound centers (based on Hally 1996:Figures 6.1 and 6.2).

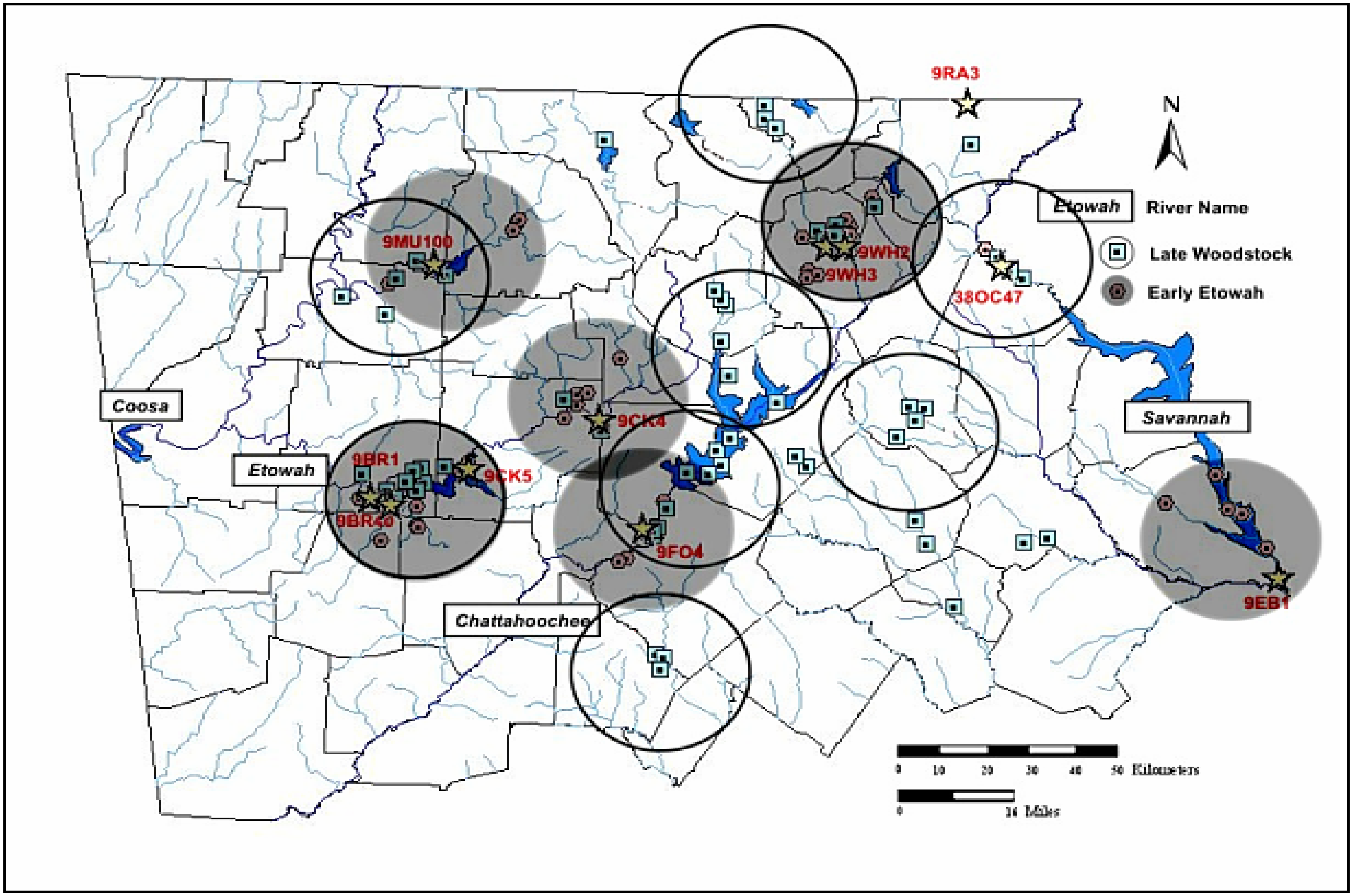

Figure 8.12 Late Woodstock and Early Etowah site distributions. Stars denote Early Etowah mound centers (based on Hally 1996:Figures 6.1 and 6.2).

settlement expands to the South Carolina and Tennessee borders, leaving vacant many of the areas where Early Woodstock clusters were located.

Early Woodstock clusters, if not merely apparent but real, tend to be located closer to each other than Late Woodstock clusters. The distance between nearest neighboring clusters ranges from a mere 7.7 km to 13.2 km. During the Late Woodstock phase, the distance between nearest neighboring clusters increases to an average of 24.2 km, with the exception of two clusters which are located within 7.7 km of each other. As site clustering characterizes politically centralized polities (Hally 1993; Steponaitis 1978), political centralization in north Georgia began during the Woodstock phase.

The Mississippian pattern of polity cycling is suggested between Early and Late Woodstock. Early Woodstock settlements are abandoned in the Late Woodstock phase, while vacant areas become the location of Late Woodstock clusters. Four clusters overlap between Late Woodstock and Early Etowah (Figure 8.11). The complete overlap of clusters around the Etowah mound site (9BR1), the Nacoochee Mound site (9WH3), and possibly around the Chauga mound site (38OC47), does not readily fit the model of chiefdom cycling. The refinement of the Woodstock phase chronology into two 100-year sub-phases is a step toward developing "the fine chronological controls" (Williams and Shapiro 1996:148) necessary to determine the context within which mound centers developed. Further refinement of Late Woodstock and Early Etowah sites distributions, however, is needed. The Early and Late Woodstock settlement data lack centralized mound sites although a tentative mound center has been identified. Summerour (9FO16) may eventually prove to be a Woodstock mound center, but currently, the ceramic and stratigraphic data indicate that the mound was constructed during the Swift Creek phase and that the site was merely reoccupied during both Early and Late Woodstock.

An overlap of four Late Woodstock and Early Etowah clusters and the occupation of five mound centers during both Early and Late Etowah signify that application of the Late Mississippian pattern of chiefly cycling to the Late Woodstock and Early Etowah phases may not be appropriate since the model is based on polity fluctuations within fully developed chiefdoms.

CHAPTER 9

CONCLUSION

Investigation of the transitional phase between the Late Woodland and Mississippian periods (A.D. 900 to A.D. 1000) has been critical for examining political evolution in the Southeast. The period characterized by significant demographic changes, transformations in social and political organization, and the intensive incorporation of maize into existing horticultural systems is designated Emergent Mississippian (Kelly 2000; McElrath et. al 2000). In north Georgia, the Emergent Mississippian period is represented by the Woodstock phase.

Determination of the timing of changes in subsistence practices and settlement patterns is crucial to understanding the evolution of political complexity. Fieldwork conducted by academic institutions and cultural resource management firms in the past several decades has improved the quality and amount of data that archaeologists can use to explore changes in settlement patterns and subsistence practices and, ultimately, Mississippian origins. The emergence of complex political systems has been investigated in relation to Mississippian chiefdoms elsewhere, most notably the Cahokia and Moundville chiefdoms, but no real attempt has been made to investigate political complexity and the rise of the equally complex Etowah chiefdom in north Georgia. To investigate the evolution of political complexity in north Georgia, this dissertation focused on the changes in subsistence systems, ceramic vessel assemblages, and settlement patterns that occurred in the region during the Woodstock phase.

9.1 Modeling North Georgia Political Evolution

As populations grow and fill in the landscape, fertile bottomlands become increasingly less available, resulting in competition over the acquisition and control of arable land. Because existing coping mechanisms can no longer mange the risks associated with a decreased availability of land and an increased need for production, groups develop regional social networks to organize the allocation of land and to schedule labor needed to plant crops. Thus, multiple communities are integrated under a system of collective decision making that could coordinate effective defense for fields. In turn, these collective networks provided the opportunity for a powerful leadership to arise through the control of access to productive resources.

Networks are further elaborated as new institutions are developed to perpetuate the power of individual leaders. In the Mississippian Moundville and Cahokia chiefdoms, the organizational demands of intensified production of native crops and of maize in particular resulted in the centralization of the political system through the consolidation of power by individual leaders. The settlement pattern of both the Cahokia and Moundville chiefdoms reflects this process of centralization through the clustering of multiple settlements around single administrative centers.

In north Georgia, centralized political institutions developed not in imitation of neighboring systems to the north in Tennessee and west in Alabama but within existing tribal organizations in response to "population growth, subsistence intensification, [and] decreased mobility" (Nassaney 1992:132). Current Woodstock settlement pattern data do not provide sufficient evidence to assess a population increase. Nevertheless, a pattern of increased cultivation of maize seen in other Emergent Mississippian phases should also be evidenced in the Woodstock botanical assemblage. Although there is no current evidence to suggest the existence of administrative centers in the Woodstock phase, the phase experiences the first steps toward the development of independent, small-scale polities and settlements into integrated, multisite territorial entities that are differentiated from similarly clustered neighboring entities.

9.2 Assessment of the Model

9.2a Intensification of Production

Macrobotanical maize remains from Woodstock phase sites indicate that maize was a consistent component of the Woodstock diet. Comparison of Late Woodland and Woodstock phase assemblages revealed that maize was present in Late Woodland features (ubiquity of 2-13%) but did not represent a dietary staple. The dramatic increase in the presence of maize in the Woodstock features (ubiquity of 43-82%) at these sites is consistent with the patterns of subsistence change and increased cultivation of maize that are seen in the Emergent Mississippian phase at Cahokia and the West Jefferson phase at Moundville.

In terms of location relative to flood plain, Woodstock settlement does not reflect equivalent use of uplands and lowlands but a strong preference for lowlands. Regarding stream size preference, variations noted between Swift Creek/Napier site locations and Early Woodstock site locations clearly indicate a shift toward larger flood plains. The data failed to show a significant difference in the distance of sites to the nearest river between the Late Woodland, Woodstock, and Mississippian periods. Settlement at distances at least 100 m from the flood plain leaves the flood plain open for cultivation.

The persistence of this pattern is likely due to the fact that maize was added to existing native crop production systems during the Woodstock phase and continued to be cultivated throughout the Mississippian period, continuing the need for open flood plains for cultivation.

The introduction of new vessel forms and the manufacture of indigenous vessel forms in varying size categories reflect the implementation of new food preparation techniques, presumably related to intensive maize consumption and cultivation in the Mississippian period. Hally's (1986) analysis of the Late Mississippian Barnett phase vessel assemblage shows how Mississippian food habits foster complex vessel assemblages. The increased intensity of maize production in the Woodstock phase should result in new food habits based on increased maize consumption, and this should lead to changes in the vessel assemblage. The Late Woodland vessel assemblage appears to consist of a single jar form in a single size and simple bowls in limited amounts. The Woodstock phase vessel assemblage sees a diversification in vessel forms with the addition of two new jars and one new bowl. Additionally, two vessel forms were made in at least two different sizes, presumably to meet different food preparation needs.

Reconstruction of Early Etowah vessel forms identified at least two jar forms. A possible third jar form is represented by only one vessel. Except for the occurrence of one red-filmed hooded bottle and two loop handles in the Etowah assemblage, the Etowah and Woodstock assemblages are strikingly similar. The vessel forms that were added to the existing Late Woodland vessel assemblage during the Woodstock phase remained basically unchanged into the Etowah phase. While the Early Etowah phase exhibits the addition of a few stereotypical Mississippian ceramic features (red filming, jars with loop handles, hooded bottles), the critical initial change in vessel forms, and by extension vessel function, occurred in the Woodstock phase. The timing of these changes suggests that the intensive cultivation and consumption of maize led to the vessel form changes seen in the Woodstock phase.

9.2b Integration of Settlements

I analyzed Woodstock ceramic collections to establish a ceramic chronology that divides the 200 year Woodstock phase into Early and Late divisions. ***Early*** Woodstock motifs are dominated by concentric diamond designs; the line block motif is minimally present. The concentric diamonds are surrounded by a high number of border lines. While the line block motif does not replace the concentric diamond and oval motifs, its frequency does increase through time to constitute a greater percentage of the ***Late*** Woodstock complicated stamped design repertoire. Also, the numbers of lands and grooves surrounding the concentric diamonds declines through time. Based on the ceramic chronology, I assigned Woodstock sites to Early or Late Woodstock and plotted them by sub-phase to see if clustering occurred.

Early Woodstock clusters are centrally located in north Georgia on the Etowah and Chattahoochee Rivers. Late Woodstock settlement clusters are more widely distributed and many Early Woodstock clusters cease to exist. Early Woodstock clusters tend to be located closer to each other than Late Woodstock clusters. As the settlement distribution data indicated a preference toward flood plains of large rivers, it is no surprise that during both Early and Late Woodstock, clusters are located almost exclusively along large rivers. Potentially, settlement along these large flood plains enabled the cultivation of greater quantities of food, notably maize, that could be exploited to fuel the centralization of political power through the nucleation of populations and the manipulation of surplus production by a few.

I then compared Early and Late Woodstock site distributions to the preceding Swift Creek and Napier phases and the succeeding Etowah phase. Napier and Woodstock sites tend to be located in different areas, while Swift Creek and Woodstock sites share somewhat similar distributions across the north Georgia area. Swift Creek and Napier sites appear to exhibit some clustering when distances to only the nearest neighbor are considered. This clustering may be the result of the small sample size for Napier and the lack of discrete temporal assignment of Swift Creek sites. In general, Swift Creek and Napier sites appear to be more randomly distributed, and thus more widely dispersed, than Woodstock sites.

Late Mississippian chiefdoms in northern Georgia typically had lifespans of less than 100 years and were characterized by a cycling of sites and clusters. This pattern of cycling is suggested between Early and Late Woodstock as Early Woodstock settlements are abandoned in the Late Woodstock phase, and vacant areas become the location of Late Woodstock clusters. A similarity in Late Woodstock and Early Etowah cluster locations and Early and Late Etowah signifies that the Late Mississippian pattern of cycling may not be expected during these phases since the model is based on polity fluctuations within fully developed chiefdoms. The transition between Late Woodstock and Early Etowah may represent the precise moment that settlements in the region are becoming integrated into centralized polities and authority is becoming centralized under charismatic leaders. The occupation of at least two, and possibly as many as five, mound sites in the Early and Late Etowah phases may be indicative of the regional consolidation of local polities into the powerful chiefdoms recognized in later Mississippian phases.

9.3 Conclusion

Anderson and Mainfort argue that a better understanding of site and artifact distributions at local to regional scales in the Late Woodland Southeast is needed for the successful construction of "models of settlement, subsistence and political geography" (2002b:541). As evidenced by my research, Woodstock plant use and settlement information provide a foundation for understanding the political changes that occurred during the terminal Late Woodland period and that ultimately led to the rise of political complexity (e.g. the Etowah chiefdom) in north Georgia in the Mississippian period, an issue that has been greatly overlooked to this point. The results of my dissertation allow for the construction of a developmental history for the rise of complex chiefdoms in north Georgia that can be compared to the histories that have been constructed for the Moundville and Cahokia chiefdoms.

Plant use indicates a dramatic increase in the presence of maize during the Woodstock phase, a trend that is consistent with the patterns of increased cultivation of maize exhibited by the Emergent Mississippian phase at Cahokia and the West Jefferson phase at Moundville. The diversification in vessel forms apparent in the Woodstock vessel assemblage represents indigenous responses to changes in food preparation and consumption practices related to maize production rather than the introduction of Mississippian forms. Intrusive Mississippian ceramic traits such as shell tempering, plates, and hooded bottles do not appear until the Early Etowah phase.

Subsequently, populations coalesced into numerous independent, small-scale polities. In the Cahokia and Moundville chiefdoms, these polities were based around centers, some of which exhibited platform mound and plaza construction. The Early and Late Woodstock settlement data lack mound centers, although a tentative mound center, Summerour (9FO16), has been identified. The absence of administrative centers in Early and Late Woodstock site clusters suggests an adjustment is needed to Knight's (1997) assessments of political evolution for Cahokia and Moundville.

At least in terms of political development in north Georgia, the second developmental stage should be sub-divided into an initial stage of clustering of settlements into defined territorial entities and a second stage of clustered settlements around administrative centers. Thus, the second developmental stage began in the Late Woodstock phase (A.D. 900 to A.D. 1000) and continued to intensify through the Early Etowah phase, suggesting that what has been considered Late Woodland (Woodstock) and Mississippian (Etowah) in north Georgia is more of a developmental continuum than a notable break. This 200-year (A.D. 900 to A.D. 1100) period of initial centralization is similar to the 150-year (A.D. 1050 to A.D. 1200) period of initial centralization for the Moundville chiefdom (Knight and Steponaitis 1998). Analysis of additional Early Etowah ceramic collections should further help to refine the north Georgia chronology and timing of centralization.

Future research will refine the assertions made in this dissertation. Analysis of ceramic collections for all Swift Creek, Napier and Early Etowah sites in the north Georgia study region will aid in refining the chronologies and thus the distribution of contemporaneous sites for each phase. New distribution maps will allow for the reassessment of site clustering for each phase and a more robust comparison with Early and Late Woodstock site clusters. As new Woodstock sites are excavated, new subsistence, ceramic (i.e. vessel form), and site location data will be added to existing data to assess the strength of the proposed model of political development in north Georgia.

In light of the data presented in this dissertation, the similarity in the initial stages of development for the Mississippian Cahokia, Moundville, and Etowah chiefdoms suggests that the evolution of political complexity involved fundamental changes in subsistence regimes and political organization. Thus, analysis of transformations in Woodstock subsistence and settlement patterns is instructive in examining not only the origins of Mississippian chiefdoms but also the evolution of political complexity in general.

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APPENDIX A

STATUS OF WOODSTOCK SITES RECORDED IN THE GEORGIA ARCHAEOLOGICAL SITE FILE

SITE	NAME	STATUS OF COLLECTION
9BA7	WHITE HOMESTEAD	Inadequate sample size
9BA17	GROVE CREEK	Analyzed by author
9BA42		Inadequate sample size
9BA52		Inadequate sample size
9BA56		Inadequate sample size
9BA85	WILSON SHOALS	Inadequate sample size
9BA90		Inadequate sample size
9BR12	PUMPKIN VINE	Analyzed by author
9BR28	PETTIT CREEK	Private collection
9BR53		Private collection
9BR82		Private collection
9BR98		Collection location unknown
9BR139	STAMP CREEK	Analyzed by author
9BR140	CALDWELL BR71	Analyzed by author
9BR142		Collection location unknown
9BR159	CALDWELL BR76	Collection location unknown
9BR170	CALDWELL BR54	Collection location unknown
9BR718		Analyzed by author – inadequate sample size
9CA18	ISIAH HUNTER	Analyzed by author
9CK2	WOODSTOCK	Counts derived from reports, manuscripts
9CK4	HORSESHOE BEND	Counts derived from reports, manuscripts
9CK5	WILBANKS	Counts derived from reports, manuscripts
9CK7	NOONDAY CREEK	Counts derived from reports, manuscripts

SITE	NAME	STATUS OF COLLECTION
9CK9	HICKORY LOG	Analyzed by author
9CK12	INGRAM	Counts derived from reports, manuscripts
9CK13		Inadequate sample size
9CK14	NELSON	Inadequate sample size
9CK15	CLINE FARM	Inadequate sample size
9CK16		Analyzed by author
9CK17	SMITHWICK CREEK	Counts derived from reports, manuscripts
9CK19	COKER	Counts derived from reports, manuscripts
9CK23	CHAMBERS	Analyzed by author
9CK26	SIXES OLD TOWN	Analyzed by author
9CK27	SIXES OLD TOWN	Collection lost
9CK45		Collection lost
9CK48		Main collection lost; inadequate sample size
9CK53		Main collection lost; inadequate sample size
9CK56		Main collection lost; inadequate sample size
9CK68		Analyzed by author
9CK70		Collection lost
9CK72		Analyzed by author
9CK79		Collection lost
9CK81		Collection lost
9CK100		Collection lost
9CK103		Analyzed by author
9CK104		Main collection lost; inadequate sample size
9CK129		Private collection
9CK131	HOBGOOD	Collection location unknown
9CK647		Analyzed by author
9CK654		Inadequate sample size
9CL10		Analyzed by author – inadequate sample size
9CL63	HICKORY LEVEL	Analyzed by author – inadequate sample size
9CL172	LOWER BALLARD'S BRG	Collection location unknown
9CL191	SAND FIELD CREEK	Collection location unknown
9CO1	STANDING PEACHTREE	Analyzed by author

SITE	NAME	STATUS OF COLLECTION
9CO13		Inadequate sample size
9CO32		Collection location unknown
9CO60	LITTLE ALLATOONA CON	Private collection
9CO84	COCHISE CLUB	Collection location unknown
9CO88	MAUTHE	Collection location unknown
9CO89	POWERS FERRY VILLAGE	Collection location unknown
9CO114	NOONDAY CREEK	Collection location unknown
9CO311	WINDSOCK	Collection location unknown
9CO336	W CARRINGTON RUSSEL	Collection location unknown
9CO376	SHELLY CHARLES 2	Collection location unknown
9CO400	MORGAN FALLS VILLAGE	Collection location unknown
9CO446	FREY/CHASTAIN ROAD	Collection location unknown
9CO453	SIX FLAGS/WHITE ROAD	Collection location unknown
9CO482	POWDER SPRINGS	Collection location unknown
9DA3		Site not plotted on GASF maps
9DA4		Site not plotted on GASF maps
9DA14	MURPHY CANDLER PARK	Inadequate sample size
9DA242		Inadequate sample size
9DA255		Analyzed by author
9DA257		Analyzed by author
9DA259		Analyzed by author
9DA260		Analyzed by author
9DO1	VANDIVER	Analyzed by author
9DO2	ANNEEWAKEE CREEK	Counts derived from reports, manuscripts
9DO69	WESTFORK	Collection location unknown
9DW1	HIGH TOWER RI	Counts derived from reports, manuscripts
9DW60	HAMBY	
9EB3	EAST DOVE CREEK	Inadequate sample size
9EB13	CANOE LANDING	Collection location unknown
9EB76		Collection location unknown
9FL47		
9FL193		Private collection

SITE	NAME	STATUS OF COLLECTION
9FN4	NOONTOOTLA CREEK	Counts derived from reports, manuscripts
9FN40	DAVENPORT	Counts derived from reports, manuscripts
9FN124		
9FO1	STRICKLAND FERRY	Analyzed by author
9FO2	SAWNEE FIELD	Site not plotted on GASF maps
9FO3	SETTINGDOWN CREEK	Counts derived from reports, manuscripts
9FO12	CALDWELL 41A	Counts derived from reports, manuscripts
9FO13	CALDWELL 41B	Inadequate sample size
9FO16	SUMMEROUR MOUND	Analyzed by author
9FO25	CALDWELL 48A	Collection location unknown
9FO27		Inadequate sample size
9FO29	TERRY'S FERRY	Analyzed by author
9FO208	SETTLES PASTURE	Analyzed by author
9FO209	SETTLES	Analyzed by author
9FO210		Collection location unknown
9FO228	HOOTCH	Private collection
9FO233		Collection location unknown
9FO236		Inadequate sample size
9FO253		Inadequate sample size
9FO256		Analyzed by author
9FU2	CAPTAIN JOHNS	Counts derived from reports, manuscripts
9FU3		Counts derived from reports, manuscripts
9FU5		Inadequate sample size
9FU221		Lithic collection only
9GI23	ANDERSON	Inadequate sample size
9GI95	OWL TOWN CREEK	Inadequate sample size
9GO4	THOMPSON	Analyzed by author
9GO12		
9GO59	LUM MOSS	
9GW1	YELLOW RIVER	Site not plotted on GASF maps
9GW3		Inadequate sample size
9GW70	RIVERMOORE	Analyzed by author

SITE	NAME	STATUS OF COLLECTION
9GW110		Inadequate sample size
9GW112		Analyzed by author – inadequate sample size
9GW146		
9GW188		Inadequate sample size
9GW193		Counts derived from reports, manuscripts
9GW194		Inadequate sample size
9GW196		Inadequate sample size
9GW203		Inadequate sample size
9GW204		Inadequate sample size
9GW206		Inadequate sample size
9GW209		Counts derived from reports, manuscripts
9GW211		Inadequate sample size
9GW220		Inadequate sample size
9GW231		Inadequate sample size
9GW330	HILLARY-MARSH TER 2	Collection location unknown
9GW338		Inadequate sample size
9GW492		Inadequate sample size
9GW494		Counts derived from reports, manuscripts
9GW495		Analyzed by author
9GW496		Inadequate sample size
9GW497		Counts derived from reports, manuscripts
9HL16	CALDWELL 40	Counts derived from reports, manuscripts
9HL17	CALDWELL 41	Counts derived from reports, manuscripts
9HL20	CALDWELL 44	Collection location unknown
9HL32	CALDWELL 57	Counts derived from reports, manuscripts
9HL36	CALDWELL 61	Counts derived from reports, manuscripts
9HL45	CALDWELL 70	Counts derived from reports, manuscripts
9HL366		Counts derived from reports, manuscripts
9HL425		Inadequate sample size
9HL427		
9HL428		Counts derived from reports, manuscripts
9HM2		Counts derived from reports, manuscripts

SITE	NAME	STATUS OF COLLECTION
9HM4	ALLEY FARM	Site not plotted on GASF maps
9HM7	ALLEY 1 (ALLEY HILL TOP)	
9HM177		Collection location unknown
9HR24	WALKER CREEK	Private collection
9JK24	PARRS FIELD	Site not plotted on GASF maps
9JK59		
9JK141		Analyzed by author
9LU7	CHESTATEE	Analyzed by author
9LU27		Collection location unknown
9LU28		Collection location unknown
9LU43		Inadequate sample size
9MD1	SOUTHFORK	Inadequate sample size
9MD2	ROCK SPRING	Counts derived from reports, manuscripts
9MU8		Analyzed by author
9MU103	POTTS TRACT	Analyzed by author
9OG306		Analyzed by author
9PI3	TATE	Counts derived from reports, manuscripts
9PI4	FOUR MILE CREEK	Inadequate sample size
9PI118	TALKING ROCK	Collection location unknown
9RA88		Analyzed by author
9RO53	BANKS B	Counts derived from reports, manuscripts
9RO84	SNAKE	
9ST1	TUGALOO MOUND	Counts derived from reports, manuscripts
9ST3	ESTATOE	Analyzed by author
9ST12	COTTON HOUSE	Analyzed by author – inadequate sample size
9ST24	BROWN BOTTOM	Analyzed by author – not applicable
9TO2	BRASSTOWN CREEK	Counts derived from reports, manuscripts
9TO11	INDIAN TRAIL	Counts derived from reports, manuscripts
9TO19	REALTY	Analyzed by author – inadequate sample size
9TO48		Counts derived from reports, manuscripts
9UN2	EXPERIMENT STATION	Collection location unknown
9UN10		Analyzed by author – inadequate sample size

SITE	NAME	STATUS OF COLLECTION
9UN172		
9UN180		
9UN181		
9UN188	RIVER	
9WH2	EASTWOOD	
9WH3	NACOOCHEE	Counts derived from reports, manuscripts
9WH5	LUMSDEN	Counts derived from reports, manuscripts
9WH6	WILLIAMS	Inadequate sample size
9WH8	NEW	Counts derived from reports, manuscripts
9WH14		Counts derived from reports, manuscripts
9WH18	MAULDIN CREEK	Counts derived from reports, manuscripts
9WH19	BURRONG	Counts derived from reports, manuscripts
9WH20	LAWRENCE VANDIVER	Inadequate sample size
9WH21	G A VANDIVER	Counts derived from reports, manuscripts
9WH26	TATUM	Inadequate sample size
9WH29	WILL WHITE	Collection location unknown
9WH32		Site not plotted on GASF maps
9WH33	HENSHAW CREEK	Site not plotted on GASF maps
9WH71		
9WH123		Collection location unknown
9WH124		Collection location unknown
9WN5		Counts derived from reports, manuscripts

APPENDIX B

BOTANICAL REPORT FOR 9MU103 AND 9CK9

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Methods

Flotation samples (from 4 9CK9 and 1 from 9MU103) were analyzed using standard methods for the Eastern Woodlands. I analyzed only the light portion of the samples, as the heavy portion had been analyzed previously and found to contain no plant remains.

The samples were weighed and sieved through geological screens (mesh sizes 2 mm, 1.4 mm, and .7 mm). The separation of materials via the geological sieve allows for easier sorting at differing magnifications according to the size of the material. All portions of the sample were then analyzed using a stereoscopic microscope.

All remains greater than 2.0 mm in size were sorted completely, and non-plant matter, bone, wood and other plant remains were separated from one another. Acorn and hazel nutshell fragments were removed from the 1.4 mm sieve in addition to the 2.0 mm screen, along with corn cupules and kernels, seeds and seed fragments. The acorn fragments were removed from the 1.4 mm sieve in order to account for their lack of abundance due to fragility in comparison to hickory. Separated non-plant matter, bone, wood and plant remains were all weighed, and the plant remains were also counted.

Reanalysis was conducted on previously analyzed materials from 9CK9. This was a highly problematic endeavor. Samples were kept in unsealed bags and many portions of the samples were missing. Plant remains were also not kept in an organized fashion, with capsules containing many different types of plant remains being common (hence I was not only confirming, but second guessing the earlier analyst's interpretation). These also were disassociated from the sample bags and had to be re-associated to complete the sample.

I reviewed all the plant remains that had been identified that were still in the collection. I re-scanned wood and residue from 2 samples, and did not find any missed plant remains, and so decided not to continue a complete re-analysis, instead focusing on verifying earlier identifications and counts. Also, I chose not to re-check the wood identifications as these are not relevant to characterizing subsistence at the site. I first verified the identifications of the plant remains (with some valuable assistance from Professor C.M. Scarry UNC-CH), and then re-counted and re-weighed the identified remains. The previous analyst had only measured weights up to .1 gram. I prefer to measure to the .01 gram, as most plant remains fall under .1 grams.

In many cases, the plant remains that had been reported were identified incorrectly or had been miscounted. Corrections were made as appropriate. However, many samples were missing, and these were kept in the data table due to the fact that there are a minimal number of samples and any data is valuable. I highlighted the data that I was not able to reconfirm in the table using italics. The exceptions are that I did not include the phaseolus sp (bean) remain in my discussion, because the earlier analyst had been tentative (as indicated by a ?) in this identification and I could not confirm this identification. I excluded feature 8633 (bag 4386) from the analysis because no counts were listed for the nutshell remains and I could not find the nutshell remains to recount them.

Plant remains from 9MU103 (Potts' Tract)

It is difficult to make any sweeping conclusions about the nature of subsistence at the Potts' Tract site (9MU103) due to the scarcity of samples (there were 4 samples). The inhabitants of the site were eating both wild and cultivated plant foods. Nutshell remains indicate that acorn, hickory and walnut were all consumed. The walnut remains came from one feature and are very abundant within that feature. This may indicate remains from a processing event. Corn kernel and cupules as well as little barley were present in the sample, indicating cultivation activities. Grape seeds, legume type seeds (wild peas) and pokeweed represent evidence of wild food collection.

Plant remains from 9CK9 (Hickory Log)

The inhabitants of 9CK9 were using similar plant foods to those of 9MU103. The range of plant foods was more diverse than the plant foods at 9CK9, however.

The inhabitants of the site were eating both wild and cultivated plant foods. Nut shell remains indicate that acorn, hickory and walnut were all consumed. Fruits were consumed in the form of service berry, maypop, persimmon, bearsfoot, elderberry, grape and hawthorn. Knotweed was used for edible greens.

Corn kernel and cupules, little barley, maygrass and sunflower were present in the sample, indicating cultivation activities. The sunflower seed measured 6 mm long by 3 mm wide, which places it in the range of intermediary type seeds, and so it may be a hybrid wild/cultivated type (Yarnell 1986).

Discussion: Patterns of plant remains in the lower/interior Southeast

The general pattern of prehistoric plant use in the interior Southeast (southern Kentucky, Tennessee, northern Alabama, and western portions of North Carolina and West Virginia) and the lower southeastern United States (piedmont and coastal plains of South Carolina, peninsular Florida, Georgia, Alabama, and eastern Mississippi) shows that when corn becomes important as a crop, nuts in general are less represented in the diet (Scarry 2003). In earlier periods (Archaic to Middle Woodland), walnut family nuts (hickory, walnut, and beechnuts), which are high in oil, comprise the majority (well over 50% in total counts) of remains (Scarry 2003; Yarnell and Black 1985). However, in later periods, corn, walnut family and acorn remains converge, and eventually in the lower Southeast corn and walnut family remains reverse their importance, with maize comprising over 50% of the remains in later Mississippian phases (Scarry 2003).

In the lower Southeast the emergent Mississippian pattern is one where corn, acorn, and hickory are all equally well represented in the assemblage (Scarry 2003). In the interior Southeast there is a trend in emergent Mississippian contexts and beyond where acorn and eventually hickory decrease in importance when corn emerges as a dominant crop (Scarry 2003).

In contrast to the American Bottom, starchy seeds are never a large percentage of the diet in the lower/interior Southeast (Johannessen 1993; Scarry 2003, 1993). The change in consumption that emerges with the dominance of corn is better tracked in the lower

Southeast by the amount of wild versus cultivated foods in the diet, the composition of those wild foods, and the overall percentage of maize in the total edible remains (Scarry 1993).

With this low number of samples, commentary on the nature of nuts versus cultivated food sources at the 9CK9 and 9MU103 is difficult. Statistical analyses are not useful when discussing small numbers of samples. Percentages are a general way of describing the relative amounts of food types and are more suitable for use with a few samples.

The table below presents relevant counts and percentages of remains from 9CK9 and 9MU103. Because of the ambiguity in taxa weights due to the missing data from the earlier analysis, I have used counts rather than weights which are more accurately comparable. Counts are also more comparable than weight due to the differing densities of various plant remains (1 piece of acorn nutshell weighs less than one piece of hickory nutshell, for example). In addition, using counts is consistent with the methodology that C.M. Scarry (2003) used to describe large scale patterns of plant use in the southeastern interior over time. The interpretations here are based on comparisons to Scarry's (2003) survey of plant remains from sites in the southeast and regional patterns derived from them.

Of the edible remains at 9MU103, the vast majority of these are nutshell, with acorn comprising only 7% of the total edible remains and remains from the walnut family (oily nuts) comprising 82% of the total edible remains. Acorn and maize are nearly equally represented, with maize making up 10% of the edible remains and acorn making up 7% of the edible remains. Maize is found in 50% of the features/samples (two of four) which is fairly low, so the pattern there is consistent with the beginnings of corn use. However, the high amounts of shell from the walnut family (oily nuts, including hickory) are consistent with earlier patterns. The high amount of walnut itself in the 9MU103 assemblage is anomalous with general regional patterns. Walnut is never particularly prominent in plant assemblages of lower southeastern sites or in interior southeastern sites (Scarry 2003).

Table B.1 Total counts and percentages representing data pertinent to tracking transitions.

TOTALS	**9MU103**	**9CK9: Total**	**9CK9: Swift Creek**	**9CK9: Late Woodland**	**9CK9: Woodstock**
Edible remains	1780	1405	32	290	1077
Nutshell	1581	1071	31	273	762
Walnut family (hickory/walnut)	1463	590	17	181	392
Hickory	289	552	15	160	377
Acorn	118	481	14	92	375
Walnut	1142	38	2	21	15
Cultigens	183	233	1	6	225
Maize	182	68	-	2	66
% of acorn in total*	7%	34%	44%	32%	35%
% of hickory in total*	16%	39%	47%	55%	35%
% of walnut in total*	64%	3%	6%	7%	1%
% walnut family in total*	82%	42%	53%	62%	36%
% of cultigens in total*	10%	17%	3%	2%	21%
% of maize in total*	10%	5%	0%	<.01%	6%
% of non-maize cultigens in total*	<1%	12%	3%	1%	15%
% of maize in total cultigens	99.45%	29%	0%	30%	29%

*total=total edible remains

The complete assemblage of 9CK9 shows patterns similar to 9MU103, with maize comprising less of the assemblage at only 5%. Acorn and walnut families are relatively equal in presence, at 42% and 34%. This is consistent with the trend in the Late Woodland phase where nuts are on the decline in general, and walnut family (oily) nuts and acorn are equal in presence. However, maize is still only at 5%, which is consistent with the earliest part of the emergent Mississippian phase. Also, maize is found in 60% of the samples, which is consistent with the very beginnings of maize dominance. In later periods, maize is more ubiquitous. The high amount of non-maize cultigens in the 9CK9 assemblage is intriguing, as it is not consistent with the overall pattern of the lower/interior southeastern regions at any time period (Scarry 2003). The patterns of the total assemblage may not be as representative as the patterns within the different phases, however.

Looking at the patterns in the different phases represented at 9CK9, the features from the Swift Creek phase and the Late Woodland are similar in nut and cultivated plants represented. Hickory is dominant at 62% in the Late Woodland features and 53% in the Swift Creek features. The presence of maize is very low at <.01% in the Late Woodland features and completely absent from the Swift Creek features. The overall patterns of these two phases match the trends Scarry identifies with the Late Woodland and earlier periods for the lower Southeast (2003).

The remains from the Woodstock phase differ from the other two phases, with hickory and acorn being identically represented, and cultigens (including maize) increasing considerably. Maize comprises 6% of the remains in the Woodstock phase, compared to <1% in the other two phases. Maize is present in 9 of eleven samples; 82% of the samples in this phase contain maize. This increase in maize as compared to the other phases, and the decrease in the presence of hickory/walnut family, is consistent with overall trends in the lower Southeast through time, as hickory decreases in importance and maize expands in importance. The pattern in the Woodstock phase, with acorn and hickory being equally represented (at 35%) and the small expansion of maize presence is consistent with patterns Scarry finds in the lower Southeast during the emergent Mississippian period. The high levels of non-maize cultigens found in this phase is unusual for any time period, as non-maize cultigens (starchy seeds) are usually well under 10% throughout pre-history in the lower Southeast (Scarry 2003).

Seasonality information

Seeds remain in the environment year round and are frequently stored by harvesters; hence, determinations of seasonal activities at sites using plant remains are dubious under most circumstances. The two sites discussed in this report are no exceptions to this difficulty. However, it is easier to say when people were probably present, as presumably they had to collect the edible plants that comprise the assemblage. The tables below show the season of harvest of the plant remains found at the two sites. Given, though, that the inhabitants of the sites were engaged in agriculture which demands year round activity (field preparation and storage), there was probably year round occupation at both sites.

Table B.2 Plant remains at 9CK9 and their seasonality (Scarry 2003).

NUTS	SEASON
Carya sp. (hickory)	Fall
Juglans sp. (walnut)	Fall
Quercus sp. (acorn)	Fall
CULTIGENS	**SEASON**
Chenopodium sp. (chenopod)	Late summer/fall (seeds) Spring/summer (greens)
Helianthus annus (sunflower)	Late summer/fall
Phalaris caroliniana (maygrass)	Spring/early summer
Phaseolus sp. ??	Late summer/fall
Zea mays (maize)	Summer
WILD EDIBLES	**SEASON**
Cratageous sp. (hawthorn)	Summer/fall
Diospyros virginiana (persimmon)	Fall
Passiflora incarnata (maypop)	Midsummer/fall
Polygonum sp. (knotweed)	Summer
Polymnia uvedalia (bearsfoot)	Late summer/fall
Prunus sp. (cherry/plum)	Midsummer/fall
Sambucus canadensis (elderberry)	Late summer/fall
Vitis sp. (grape)	Midsummer/fall

Table B.3 Plant remains at 9MU103 and their seasonality.

NUTS	SEASON
Carya sp. (Hickory)	Fall
Julgans sp. (Walnut)	Fall
Quercus sp. (Acorn)	Fall
CULTIGENS	**SEASON**
Zea mays (Corn)	Summer/Fall
Poa cf. (Little Barley)	Spring/early summer
WILD EDIBLES	**SEASON**
Phytolaca sp. (Pokeweed)	Spring/summer
Legume type (poss. Hogpea)	Unknown
Vitis sp. (Grape)	Midsummer/Fall
WEEDS	**SEASON**
Paspalum type	Unknown
Ipomea sp. (Morning glory)	Summer/Fall

Table B.4 Archaeological remains from Late Woodland Flotation Samples (9CK9).

Feature	6334		7114		7167		8620		8633		9201	
Bag	4135		4288		3788		4348		4386		4521	
Liters Floated	61		13		10		11		23		12	
Total Sample Weight (g)		73	11		5.6		7.1		13.7		37	
Residual wt.		58.5	7.2		3.5		5.1		8.7		24.5	
(1.0 and .25mm screen or 1.4,												
.70, screen and bottom pan)												
	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.	No.	Wt.
NUTSHELL												
Carya sp. (hickory)	134	1.63			12	0.12	9	0.1	*??*	*0.4*	5	0.04
Juglans sp. (walnut)	15	0.2			2	0.06	1	0.01	*3*	*<.1*		
Quercus sp. (acorn)												
meat					2	0.01						
shell	77	0.34			4	0.01	6	0.01			3	0.01
TOTAL NUTSHELL	**226**	**2.1**			**20**	**0.2**	**16**	**0.11**	***3***	*****	**8**	**0.05**
CULTIGENS												
Chenopodium sp. (chenopod)												
Helianthus annus (sunflower)												
Phalaris caroliniana (maygrass)					*1*	*>.01*			*2W*	*<.1*		
Phaseolus sp					*1F?*	*>.1*						
Zea mays (maize)												
cupule (and rachis flaps)	1W	<.01			*1F*	*>.1*						
kernel												
TOTAL CULTIGENS	**1**	**<.01**			***3***	*****			***2***	*****		
WILD EDIBLES												
Amelanchier (service berry)												
Cratageous sp. (hawthorn)												
Diospyros virginiana (persimmon)					*1F*	*<.1*						
Passiflora incarnata (maypop)	2W,7F	0.14										
Polygonum sp. (knotweed)												
Polymnia canadensis (bearsfoot)												
Prunus sp. (cherry/plum)												
Sambucus canadensis (elderberry)												
Vitis sp. (grape)					*1F*	*>.1*						
TOTAL WILD EDIBLES	**9**	**0.14**			***2***	*****						
Total plant edible remains												
WEEDS, ETC.												
Poaceae (grass)					*1*	*>.01*						
Gallium (bedstraw)												
Gledistia triacanthos (honey locust)											*1F*	*<.1*
TOTAL WEEDS					***1***	*****					***1***	
UNIDENTIFIED												

Table B.5 Archaeological remains from Swift Creek Flotation Samples (9CK9).

Feature	6119	B8	7010		TOTAL	
Bag	3543		3803			
Liters Floated		79		6		
Total Sample Weight (g)	9.8		8.3			
Residual wt.	8.3		4.8			
(1.0 and .25mm screen or						
1.4, .70, screen and bottom pan)						
	No.	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**
NUTSHELL						
Carya sp. (hickory)	9	0.05	6	0.04	*142*	*2.79*
Juglans sp. (walnut)			2	0.04	*14*	*0.24*
Quercus sp. (acorn)						
meat						
shell	12	0.05	2	0.01	*76*	*0.17*
TOTAL NUTSHELL	**21**	**0.1**	**10**	**0.09**	***232***	***3.2***
CULTIGENS						
Chenopodium sp. (chenopod)						
Helianthus annus (sunflower)						
Phalaris caroliniana (maygrass)			2W	<0.01	12	*
Zea mays (maize)						
cupule (and rachis flaps)					2	*
kernel					3	*
TOTAL CULTIGENS					**15**	*
WILD EDIBLES						
Amelanchier (service berry)						
Cratageous sp. (hawthorn)						
Diospyros virginiana (persimmon)					4	*
Passiflora incarnata (maypop)			1F	>.01	1	>.01
Polygonum sp. (knotweed)						
Polymnia canadensis (bearsfoot)					1	*
Prunus sp.						
Sambucus canadensis (elderberry)						
Vitis sp. (grape)					1	*
TOTAL WILD EDIBLES			**1**	**0.01**	**7**	*
Total plant edible remains					**254**	*
WEEDS, ETC.						
Poaceae (grass)			2W	>.01	19	*
Gallium (bedstraw)					1	*
Gledistia triacanthos (honey locust)						
Insect gall						
TOTAL WEEDS					**20**	*
UNIDENTIFIED						

Table B.6 Archaeological remains from Woodstock Flotation Samples (9CK9).

Feature	**6116**		**6227**		**6330**		**6962**	**B49**	**6967**	**B14**	**7505**		**7902**		**7902**		**8052**		**9208**		**TOTAL**	
Bag	3397		4119		3312		3596		3677		4041		4222		4267		4209		4526			
Liters Floated	11		13		10			53		41	?		13		8		15		10			
Total Sample Weight (g)	1.8			3.4 ?			83.3		14.7		40.47		12		10		6.2		34.1			
Residual wt.	1			3			59.2		6.7		33.43		5.5		4.5		5.1		21.5			
(1.0 and .25mm screen or																						
1.4, .70, screen and bottom pan)																						
	No.	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**
NUTSHELL																						
Carya sp. (hickory)	2	0.02	1	<0.1	14	0.15	*100+*	*2.4*	27	0.3	5	0.04	8	0.05	2	0.05	8	0.02	9	0.1	245	*5.11*
Juglans sp. (walnut)							*6*	*<.1*	6	0.1											*3*	*<.1*
Quercus sp. (acorn) meat			5	<0.1															1	<.01	47	*<.33*
Quercus sp. (acorn) shell	19	0.05			2	0.01	*61*	*<.1*	1	0.01			3	0.01			3	0.01	2	<.01	266	3.06
TOTAL NUTSHELL			**6**	**0.1**	**16**	**0.16**	***167+***	***2.6***	**34**	**0.41**			**11**	**0.06**			**11**	**0.03**	**11**	**0.11**	**561**	**8.61**
CULTIGENS																						
Chenopodium sp. (chenopod)											1	<.01									1	<.01
Helianthus annus (sunflower)																					1	0.02
Phalaris caroliniana (maygrass)					*1W*	*<.1*			10W	<.1			4	>.01							*147*	*<0.22*
Phaseolus sp.																						
Zea mays (maize)																						
cupule (and rachis flaps)			5	0.02	*3W,7F*	*<.1*			*2F*	*<.1*			1W,3F	0.03					1	0.01	35	*0.12*
kernel (including germ)							1F	0.02	*2F*	*<.1*							*3F*	*<.1*			*26*	*0.29*
TOTAL CULTIGENS			**5**	**0.02**	***11***	*****	**1**	**0.02**	***14***	***No Data***			**8**	**0.04**			***3***	*****	**1**	**0.01**	**209**	**0.65**
WILD EDIBLES																						
Amelanchier (service berry)			5	0.01																	5	0.01
Cratageous sp. (hawthorn)																					1	0.03
Diospyros virginiana (persimmon)									*4F*	*<.1*											1	0.02
Passiflora incarnata (maypop)													1W,2F	0.03							24	0.15
Polygonum sp. (knotweed)																	*2F*	*<.1*			2	<.1
Polymnia canadensis (bearsfoot)			26	0.1					*1W*	*<.1*							*1W,6F*	*<.1*			33	*0.1*
Prunus sp.																					1	*<.1*
Sambucus canadensis (elderberry)																					1	<.01
Vitis sp. (grape)					*1F*	*<.1*	*1F*	*<.1*					1W	0.01							16	*<0.14*
TOTAL WILD EDIBLES			**31**	**0.11**	***1***	*****	***1***	***0.02***	***5***	***No Data***			**4**	**0.04**			***9***	*****			**85**	**0.32**
Total plant edible remains																					**855**	**9.58**
WEEDS, ETC.																						
Poaceae (grass)									*11W,6F*	*<.1*												
Gallium (bedstraw)									*1F*	*<.1*							*1W*	*<.1*			2	<.01
Insect gall			4	0.01							1	<.01									5	0.01
TOTAL WEEDS			**4**	**0.01**					***18***	***No Data***							***1***	*****			**6**	***0.02***
UNIDENTIFIED	1	>.01	20	0.5																	**46**	**0.14**

Table B.6 Continued. Archaeological remains from Woodstock Flotation Samples (9CK9).

Feature	**9635**		**9635**		**9645**		**TOTAL**	
Bag	4397		4396		4549			
Liters Floated		54		175		36		
Total Sample Weight (g)	34.1		515.3		49			
Residual wt.	21.5		375.5		30			
(1.0 and .25mm screen or								
1.4, .70, screen and bottom pan)								
	No.	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**
NUTSHELL								
Carya sp. (hickory)	55	.92	116	3.5	30	0.3	372	7.81
Juglans sp. (walnut)			3	<.1			3	<.1
Quercus sp. (acorn)								
meat			1	.03	40	<.1	47	<.33
shell	84	.53	51	0.25	102	2.2	328	3.07
TOTAL NUTSHELL	**139**	**1.45**	**171**	**3.78**	**172**	**2.6**	**750**	**11.21**
CULTIGENS								
Chenopodium sp. (chenopod)							1	<0.01
Helianthus annus (sunflower)			1	0.02			1	0.02
Phalaris caroliniana (maygrass)	22	0.01	112	0.07	8W	<0.01	157	<0.1
Zea mays (maize)								
cupule (and rachis flaps)	4	0.03	2W,8F	0.01	1F	<0.01	37	0.12
kernel	6	0.07	1W,16F	0.21			29	0.31
TOTAL CULTIGENS	**32**	**0.11**	**123**	**0.31**	**9**	**0.02**	**225**	**0.45**
WILD EDIBLES								
Amelanchier (service berry)							5	0.01
Cratageous sp. (hawthorn)			1	0.03			1	0.03
Diospyros virginiana (persimmon)	1F	0.02					1	0.02
Passiflora incarnata (maypop)	1W,3F	0.01	2W,6F	0.04	9F	0.07	24	0.15
Polygonum sp. (knotweed)							2	<0.1
Polymnia canadensis (bearsfoot)							34	0.1
Prunus sp.	1	<0.1					1	<0.1
Sambucus canadensis (elderberry)					1W	<0.01	1	<.01
Vitis sp. (grape)	1W,3F	0.01	2W,6F	0.02	2F	<0.01	17	<0.14
TOTAL WILD EDIBLES	**10**	**0.05**	**15**	**0.07**	**121**	**0.09**	**86**	**0.45**
Total plant edible remains							**1061**	
WEEDS, ETC.								
Poaceae (grass)								
Gallium (bedstraw)			1	<.01			3	<0.01
Gledistia triacanthos (honey locust)								
Insect gall							5	0.01
TOTAL WEEDS			**1**	**<.01**			**6**	**0.02**
UNIDENTIFIED	2	.07			23	0.1	**46**	**0.14**

Table B.7 9MU103 Plant remains.

Feature	**133**		**N450 E70**		**122**		**83**		**TOTAL**	
Bag	LN327		10'X10'		LN320		N475E45, N475E50			
Liters floated	Unknown									
Percent analyzed	50%		100%		100%		100%			
Total sample weight	523.8		72.27		19.72		179.7			
Sub-sample weight	260.5		0		0		0			
Residual wt.	92.82		20.35		3.96		44.29			
	No.	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**	**No.**	**Wt.**
NUTSHELL			***No plant remains***							
Carya sp. (Hickory)	259	8.67			4	0.08	26	0.41	**289**	**9.16**
Juglans sp. (Walnut)	7	0.2					1135	91.61	**1142**	**91.81**
Juglandaceae sp. (Walnut or Hickory)	32	0.36							**32**	**0.36**
Quercus sp. (Acorn)							121	0.66	**118**	**0.66**
TOTAL NUTSHELL	**298**	**9.23**			**4**	**0.08**	**1282**	**92.68**	**1581**	**102**
CULTIGENS										
Zea mays (Corn) (kernel)	5	0.09					6	0.09	**11**	**0.18**
Zea mays (Corn) (cupule)	43	0.3					128	1.19	**171**	**1.49**
Poa cf. (Little Barley)	1	>.01							**1**	**>.01**
TOTAL CULTIGENS	**39**	**0.4**					**134**	**1.28**	**183**	**1.68**
WILD EDIBLES										
Phytolaca sp. (Pokeweed)	1	>.01							**1**	**>.01**
Legume type (poss. Hogpea)	10	0.23							**10**	**0.23**
Vitis sp. (Grape) (whole)	1	0.01					1	>.01	**2**	**0.02**
Vitis cf. (Grape) (seed pieces)	3	>.01							**3**	**>.01**
TOTAL WILD EDIBLES	**15**	**0.26**					**1**	**0.01**	**16**	**0.27**
Total plant edible remains									**1780**	**103.9**
WEEDS										
Paspalum type	8	>.01							**8**	**>.01**
Weeds unid.	15	0.01							**15**	**0.01**
Ipomea sp. (Morning glory)	7	0.02					1	0.01	**7**	**0.03**
TOTAL WEEDS	**31**	**0.04**					**1**	**0.01**	**38**	**0.06**
UNIDENTIFIED	24	0.26			3	0.01	16	0.54	**43**	**54.27**
WOOD		91.09		24.23		0.81		20.83		**140**

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