

SEARCHING A SAND DUNE: SHOVEL TESTING THE BARBER CREEK SITE

by

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Abstract

Since 2000, East Carolina University has conducted archaeological research in the Tar River Valley designed to address poorly understood aspects of Coastal Plain culture-history. Excavations at the Barber Creek site have identified stratified Woodland and Archaic period remains in a one meter deposit of sandy soils. Here, we provide an overview of the geoarchaeology done to date regarding our understanding of site formation and stratigraphy including reporting a series of radiocarbon dates from the site's Archaic component. In addition, we present the results of site shovel testing which define site boundaries covering about 1 ha and document the presence of broad-scale intrasite spatial patterning between components.

To date, much of the framework that represents the early culture-history of the North Carolina Coastal Plain is borrowed from the Carolina Piedmont (compare Coe 1964:121 with Phelps 1983:17). Of course, since most of the archaeological research in the Coastal Plain has focused on the late prehistoric and contact periods, using the well-established sequence from the Piedmont has been justified. But clearly this framework was proposed as one to be tested rather than accepted as fact (Phelps 1983:15). Unfortunately, few Coastal Plain sites dating prior to the Late Woodland have been identified with sufficient integrity to address issues related to the region's chronology and typology. Recent excavations at the Barber Creek site, however, suggest that it has the potential to address substantive issues of the region's culture-history that have remained problematic due to poor archaeological context (Daniel 2002).

The Barber Creek site was recorded over 20 years ago by East Carolina University (Phelps 1977) as part of a cultural resource survey near Greenville, North Carolina (Figure 1). Limited testing at that time indicated the presence of a 1 m deep deposit of stratified lithic and ceramic remains in a sand ridge along the Tar River. Significantly,

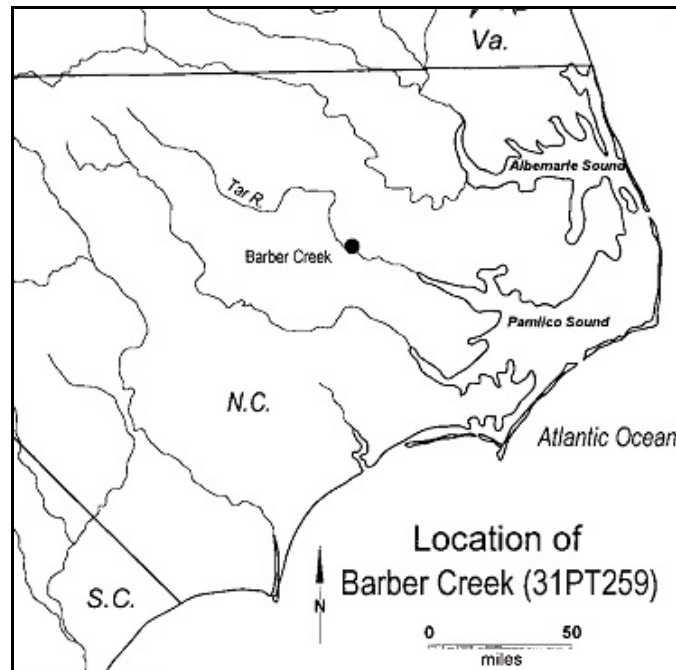


Figure 1. Barber Creek site location.

preserved organic materials including charcoal, burned nutshell, and calcined bone fragments were also present in the excavations. The potential significance of these stratified remains was mentioned in a synthesis of Coastal Plain archaeology over 20 years ago (Phelps 1983:19–20). Nevertheless, no further work was done at the site until East Carolina University returned to Barber Creek in 2000. Since then, additional field schools have been conducted at the site every summer except 2001 in order to address aspects of the region’s early prehistory including early and middle Holocene chronology, typology, and geoarchaeology (Daniel 2002).

Thus, the purpose of this paper is to: (1) report the results of the shovel testing conducted during the first season; and (2) provide an overview of the geoarchaeology done to date and our understanding of site formation and stratigraphy. In brief, our results indicate that relatively well stratified Woodland and Archaic period remains are situated in a relict sand dune at Barber Creek covering 1 ha and that intrasite spatial differences exist between components.

Geoarchaeology

The site is situated on a sand ridge that parallels Barber Creek for over 100 m near its confluence with the Tar River. Topographically, this northwest-southeast trending landform rises 2 m above the Tar floodplain north of Barber Creek. The site is heavily wooded and, with the exception of a canal that cuts through the site's eastern edge, has experienced little if any modern disturbance. An understanding of the archaeology at Barber Creek is highly dependent upon an understanding of the formation processes of the sand ridge. Here, we summarize the geoarchaeological work done to date and describe site stratigraphy. This stratigraphic discussion is based on the initial results of interpreted trench profiles from test unit excavations which have yet to be fully reported (Seramur et al. 2003).

Stratigraphy

All of the archaeological remains recovered from Barber Creek to date have been located in the top one meter of sand (Figure 2). Three pedogenic soil horizons are recorded along the sand ridge, including A-, E-, and B-horizons (e.g., Schoeneberger et al. 1988). The A-horizon extends to a depth of about 30 cmbs (centimeters below surface) and consists of a very dark grayish brown sand capped with undecayed humus. Woodland period artifacts are present throughout the A-horizon, but are particularly concentrated between 25 cm and 30 cmbs. A dark yellowish-brown (medium) sandy eluvial E-horizon is present from 30 cm to between 80 cm and 90 cmbs. Woodland and Archaic period artifacts occur in stratigraphic order within the upper and lower portions of this horizon. While a few sherds are sporadically found to a depth of about 50 cmbs, virtually no sherds are recovered below a depth of 50 cm.

Both Middle Archaic and Early Archaic components are present in the lower portion of the E-horizon. In particular, an Early Archaic zone appears to begin about 60 cm below surface and extends to about 100 cmbs; however, cultural material is sparse below about 70 to 80 cm below surface. Consequently, the Early Archaic zone straddles the lower portion of the E-horizon and the underlying B-horizon, which begins at about 80 cmbs. The poorly developed B-horizon (or cambic horizon) consists of yellowish-brown medium sand with more than a dozen 1 to 2

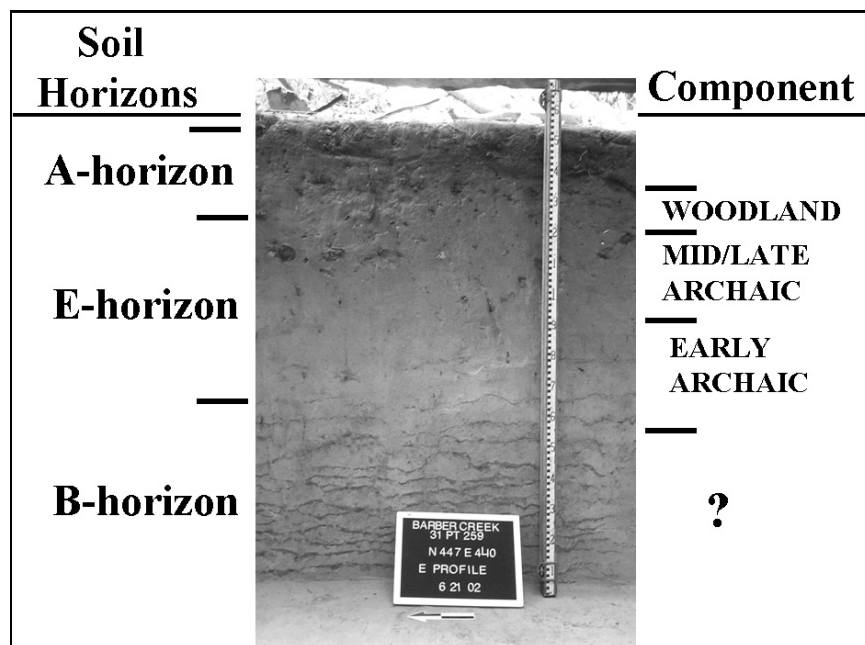


Figure 2. Barber Creek site profile.

cm thick argillic lamellae that extend to up to 1.5 meters below surface in some units. Lamellae, however, are not present in every unit.

To date, an emphasis has been placed on dating the Archaic component, and a series of seven largely concordant dates were obtained from individual levels between 40 cm and 110 cmbs (Table 1). The dates range from 8440–10,500 RCYBP, except for an appreciably younger (and probably anomalous) date from level 5. The full implications of these dates will be discussed in a later paper. Taking these dates at face value, however, they are associated with various phases of the Early Archaic as represented by bifurcate, corner-notched, and side-notched point traditions elsewhere in the Southeast (Chapman 1977). These dates would be consistent with corner-notched and bifurcate points recovered at Barber Creek. Approximately one dozen medium-to-small stemmed points have been recovered from levels 4 and 5 that document a Middle to Late Archaic component at Barber Creek. Very small stemmed points also appear associated with the Woodland component. Chronometric dates for these components and typological

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Table 1. Radiocarbon Dates from Barber Creek (31PT259).

Beta Number	Context	Material	Radiocarbon Age
166236	Level 5	wood charcoal	1470 +/- 40 BP
188955	Level 6	wood charcoal	8950 +/- 40 BP
166239	Level 7	hickory nut shell	8440 +/- 50 BP
150188	Level 8	wood charcoal & hickory nutshell	8940 +/- 70 BP
166237	Level 8	wood charcoal	9280 +/- 60 BP
166238	Level 10	wood charcoal	9860 +/- 60 BP
188956	Level 11	wood charcoal	10,500 +/- 50 BP

Note: Level depths are 10 cm intervals (e.g., level 5 equals 40-50 cmbs). Sample 150188 is a radiometric date; all others are AMS dates.

classifications for these later Archaic and Woodland points remain to be determined.

Sedimentology

This sand ridge was deposited on the northern edge of the floodplain (T₀ terrace) adjacent to an elevated alluvial T₁ terrace. Sand is transported through Coastal Plain stream valleys by aeolian (wind) and alluvial (water) processes. This study attempts to interpret the depositional processes that formed the sand ridge at Barber Creek and buried the cultural horizons. The geomorphology of the sand ridge and sedimentology of on-site and off-site sediment samples are used to interpret depositional processes at Barber Creek.

Fifteen off-site sediment samples were collected from three locations: the floodplain of Barber Creek just south of the site, the elevated alluvial T-1 terrace north of the site, and from the stream bed of Barber Creek near its confluence with the Tar River. Twenty-six on-site sediment samples were collected from three units excavated along the crest of the ridge during the first field season. These samples were analyzed for particle size distribution in the Geology Department at Appalachian State University. Sedimentological analyses included determining percent sand and fines (silt and clay) and particle size

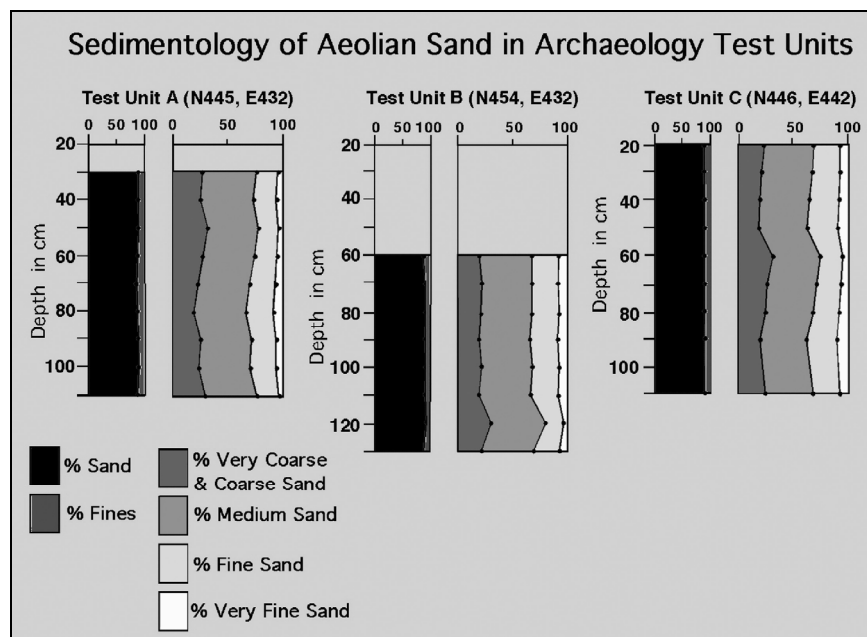


Figure 3. Sedimentological analyses from three units at Barber Creek.

distribution of the sand fraction. Sand grains from the ridge and from Barber Creek itself were imaged on a Quanta FEI 200 Scanning Electron Microscope (SEM) in the high vacuum mode at 20kV. Grains were mounted on aluminum stubs and coated with gold. Each grain was identified as quartz using Energy Dispersive X-Ray (EDX) before a photomicrograph was collected. Only quartz grains were evaluated to eliminate the possibility that sand grain mineralogy would produce different surface textures. Sedimentology and surface textures of off-site and on-site samples are compared to interpret depositional processes.

Sediment samples from the three archaeological units are well-sorted medium sand with minor percentages of fines (Figure 3). The fine fraction did not exceed 13% in any of the samples. There is little variability in these sediments, indicating formation by a consistent depositional process.

The off-site samples from the floodplain and the alluvial terrace have a very different sedimentology. The floodplain sediment is primarily coarse sand and the terrace sediment is primarily a fine to very

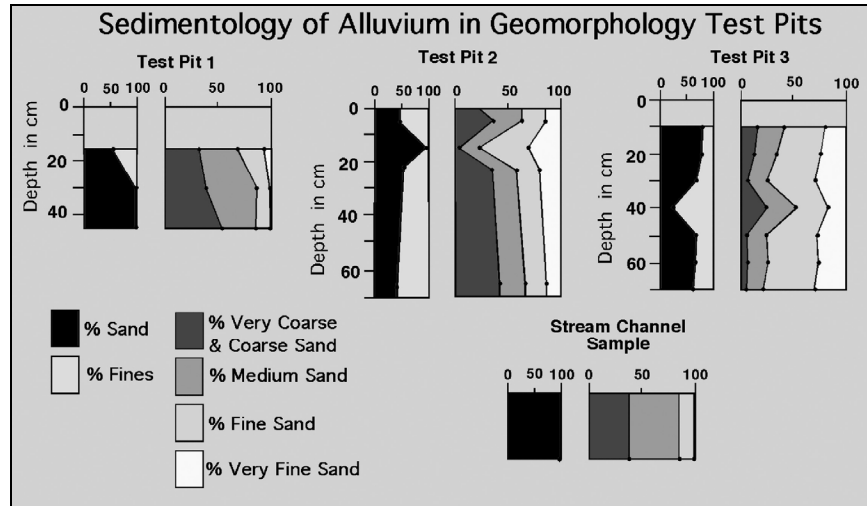


Figure 4. Sedimentological analyses from stream bed and floodplain near Barber Creek.

fine sand in contrast to the medium sand on the ridge. Percent fines varies from 2% to 76% (Figure 4). These deposits are quite variable, indicating changes in the depositional processes over time.

Statistical measures (i.e., mean grain size, standard deviation, and skewness) of the grain size distribution were calculated for each sample. Mean grain size and standard deviation of the ridge (site) sediment forms a distinct population where standard deviation increases with increased mean grain size (Figure 5). Floodplain and terrace samples are dispersed across the graph, showing variability within these deposits. The ridge sediment is positively skewed on a plot of mean grain size and skewness, and the floodplain and terrace samples are negatively skewed (Figure 6).

The alluvial sand from Barber Creek and the ridge sediment also display different surface textures when sand grains are viewed under the SEM. Alluvial sand grains are well rounded with a surface texture dominated by v-shaped and crescent-shaped depressions (Figure 7). In contrast, grains from the ridge tend to have a very angular shape with a surface texture dominated by conchoidal fractures (Figure 8). Ridge morphology is consistent with aeolian deposition. Prevailing wind direction in this part of the Coastal Plain is southwest to northeast, and the ridge has a gentle stoss (upwind) slope and a steep lee (downwind) slope. The east-northeast slope of the ridge is steepest. The orientation

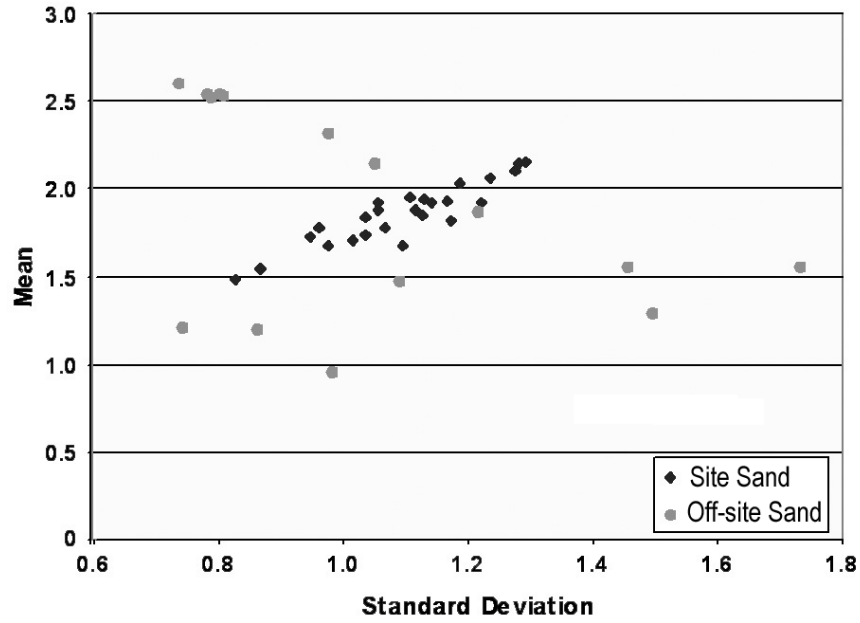


Figure 5. Scatterplot of mean grain size and standard deviation for site and off-site sediments.

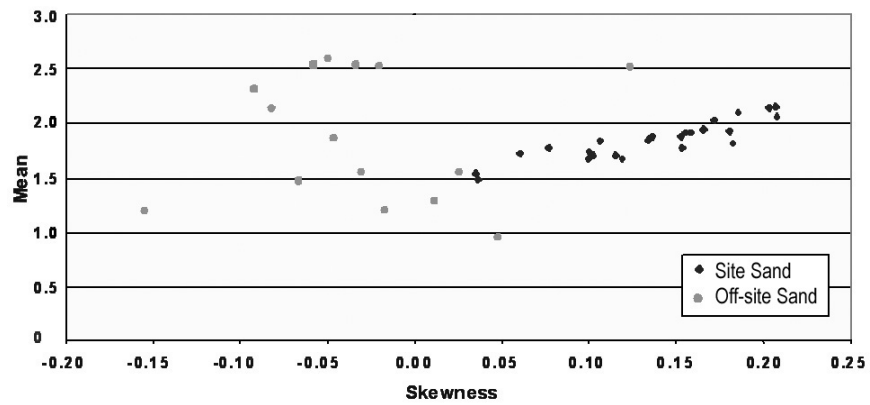


Figure 6. Scatterplot of mean grain size for site and off-site sediments.

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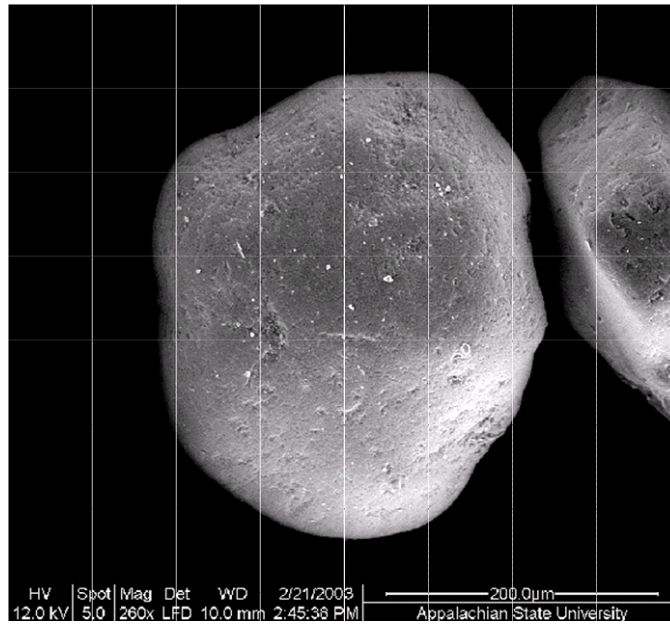


Figure 7. Scanning Electron Microscope photograph of alluvial sand grain.

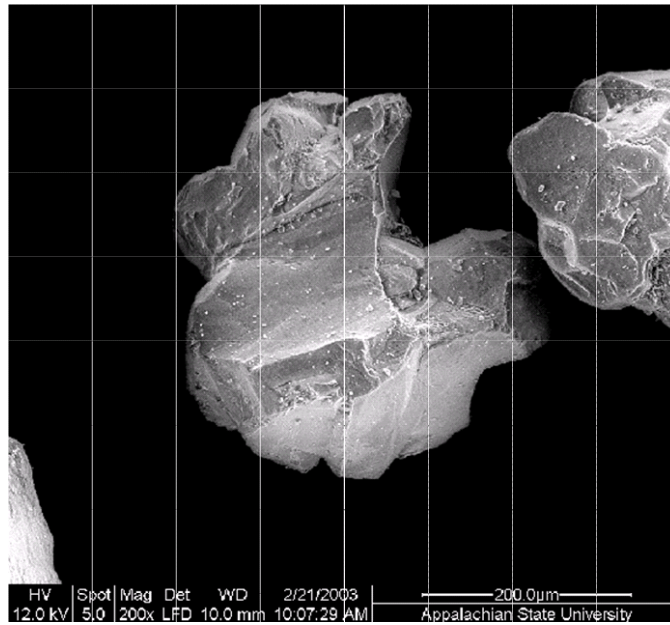


Figure 7. Scanning Electron Microscope photograph of ridge (site) sand grain.

of the dune oblique to the prevailing wind direction is probably due to local topography of the east-west Tar River valley and wind direction along the edge of the alluvial terrace.

Site Formation

Wind is a very effective sorting agent. Silt and clay-sized particles are separated from sand during aeolian transport, forming a characteristic well-sorted sediment. Aeolian deposits also tend to be positively skewed because the ability of wind to transport coarse sediment is limited. Sands are deposited as dunes or sand sheets, and the fines are deposited downwind as loess. The sand ridge at Barber Creek is interpreted as an aeolian deposit. The effectiveness of wind as a sorting agent is seen in the sedimentology logs and in the distinct population of ridge sand on the statistical graphs. On each of the graphs the dune sediment forms a distinct population different from the alluvium sediments on the adjacent floodplain and terrace (Figures 5 and 6). A variation in the wind speed over time accounts for the distribution of these grains on the statistical plots.

This ridge is periodically inundated during high magnitude flood events such as the recent (1999) hurricane Floyd. A drape of silt (and possibly clay) is deposited on the ridge during these events. This fine sediment is incorporated into the ridge deposits by illuviation and contributes to the approximately 10% fines measured by the particle size analyses (Figure 3).

The variability in sedimentology of the floodplain and terrace samples is interpreted as interbedded fluvial traction and suspension (overbank) deposits. Traction deposits are formed as currents sweep sand along the surface of a landform in contact (traction) with the bed. Suspension deposits form when silt and clay settle out of slack water. Both of these deposits can form during a single flood event. The traction sands are deposited during the initial and final stages of a flood event when flood waters inundate and drain off of the floodplain or terrace. Suspension deposits form when flood water has inundated a landform and the silt and clay settle out of the low velocity floodwaters. The coarse sand of the floodplain samples indicates that strong currents flow across this surface. The fine sand on the terrace indicates a lower velocity flow on the elevated surface.

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The SEM images show a distinct difference in surface textures between the aeolian and fluvial sand grains. Fluvial sand grains are well rounded with impact depressions formed as the grain is rolled along the stream bed. Aeolian grains collide with a much greater force because air has a lower viscosity than water. Conchoidal fractures can form when the wind-blown sand impacts other grains as pieces of the grain are calved from the grain surface. Many of the grains from the sand ridge show conchoidal fractures truncating a rounded surface texture. This indicates an initial transport by fluvial processes and subsequent aeolian transport up onto the ridge.

In sum, this ridge is interpreted as a relict aeolian sand dune. The source of the aeolian sand was the loose alluvial sediment on the floodplains of the Tar River and Barber Creek. Southwestern prevailing winds transported sand through saltation from the floodplain up to the edge of the alluvial terrace. As the wind crossed the edge of the terrace, wind velocity and/or direction changed, depositing the sand and forming the dune. In this regard, Barber Creek represents an example of the widespread presence of dunes along Coastal Plain rivers in Georgia and the Carolinas that formed between 15,000 and ~3,000 radiocarbon years ago (Markewich and Markewich 1994). Cultural material and radiocarbon dates from the upper meter of the Barber Creek dune are consistent with that age interval.

Shovel Testing

Mapping and extensive shovel testing of the sand ridge was completed during the first season's work (Figure 9). The goal of this work was to determine site boundaries, assess site integrity, and to examine the site for potential intrasite spatial patterning in artifact distributions. Shovel testing was conducted in two phases. Initially, 12 shovel tests were judgmentally excavated along the ridge during the spring of 2000. The results of that work suggested that archaeological materials were widely scattered across the landform. During the following summer, 94 shovel tests were more systematically placed at approximately 10 m intervals across the sand ridge, virtually covering the entire landform. Shovel tests were 60 cm in diameter with fill being dry-screened through a nested series of one-quarter-inch and one-eighth-inch hardware mesh. All shovel tests were excavated to a depth of one meter. While the spring shovel tests were excavated in 50-cm thick levels, the summer testing was done in 25-cm thick levels (Daniel 2002).

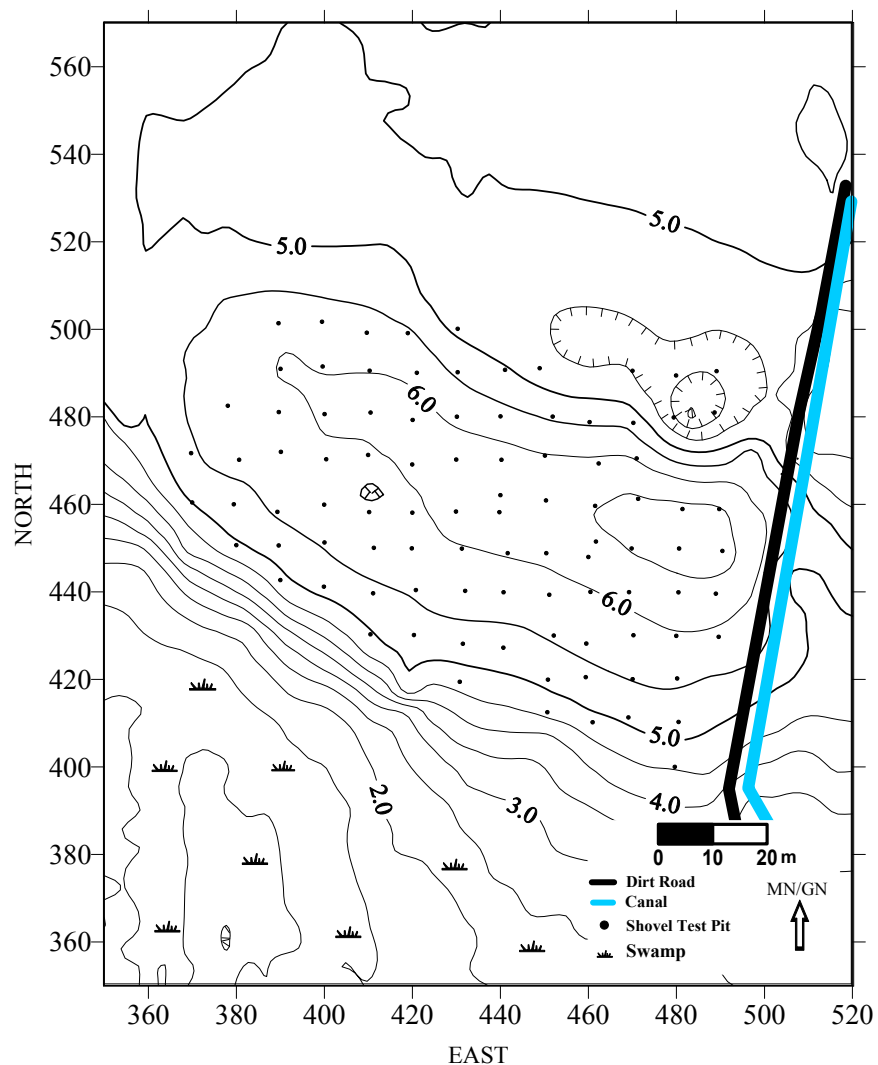


Figure 9. Location of shovel tests at Barber Creek.

As discussed below, cultural material was recovered from most shovel tests. Although shovel tests were excavated in rather thick levels, a stratigraphic pattern emerged across the ridge: ceramic artifacts were primarily present in the upper two levels of each shovel test, while stone artifacts with little to no pottery were present below that depth.

Artifacts

Artifacts recovered in the shovel tests can be broadly divided into two categories: lithics ($n=379$) and ceramics ($n=584$). The former category includes a single soapstone sherd. And while it technically represents a stone artifact, it is not included in the lithic analysis below. The latter category includes four historic period sherds which are given no further consideration here. A few other historic or modern artifacts, including rusted metal fragments and wire, were also discovered in the shovel tests, and these are also not considered further. Finally, two other items were recovered in the shovel tests which do not fall in either of the above categories: fossilized bone and petrified wood. They are rather small and their status as artifacts is unclear, given no obvious signs of having been used. Nevertheless, it is possible that prehistoric people brought them to the site. In any case, they are not discussed further.

Artifact analysis focused on identifying the number and age of the components as revealed by their typological classification and context of recovery. The lithic assemblage has received a more detailed analysis than the ceramic assemblage (Potts 2004).

Lithics

Given that flaking debris constituted the vast majority of the stone remains, the analysis focused on monitoring several flake attributes that could be used to infer stone reduction activities at Barber Creek. Initially, all flakes were sorted by raw material type, size grade, and weight (Tables 2–3). Subsequently, several other attributes were monitored on each artifact including flake condition, presence/absence of cortex, platform condition and facet count, and dorsal scar count. Details of this analysis are reported elsewhere (Potts 2004). The goal of the analysis was to reconstruct the composition of the toolkit brought into the site (e.g., tool maintenance and repair) and the tool/core types produced during the occupations (e.g., tool/core manufacture) (e.g., Binford 1979; Kelly 1988; Nelson 1991). An attempt was also made to examine potential differences in stone working activities over time, but this analysis yielded no significant results and will not be discussed further. Given the relatively small sample sizes and contexts of data recovery, it is unclear whether this conclusion is spurious or real (Potts 2004:41–44).

Table 2. Raw Material Frequencies of Lithic Debitage at Barber Creek.

Raw Material	<i>n</i>	%
Quartz/Quartzite	238	64.9
Metavolcanic	112	30.5
Chert	9	2.5
Unidentified	8	2.1
Total	367	100.0

Table 3. Size Grade Frequencies of Lithic Debitage at Barber Creek.

Size Grade	<i>n</i>	%
Size Grade 1 (25 mm)	6	1.6
Size Grade 2 (12.5 mm)	41	11.1
Size Grade 3 (6.3 mm)	133	36.2
Size Grade 4 (2.8 mm)	187	50.9
Total	367	100.0

Flaking debris, including 367 flakes, constitutes the vast majority of stone artifacts in the assemblage. Four broad classes of stone raw material comprise the assemblage: quartz/quartzite, metavolcanic stone, chert, and a residual category. Quartz/quartzite ($n=238$, 64.9%) is the predominant stone type, followed by a metavolcanic stone (30.5%, $n=112$) (Table 2). Quartz and quartzite are local raw materials, widely available in the Coastal Plain, particularly in cobble form along rivers (Clark et al. 1912:280). The presence of cobble cortex on quartz flaking debris at Barber Creek suggests at least some of this stone was acquired in cobble form from the nearby creek or river. Metavolcanic stone is a general term used for the various metamorphosed igneous stone types observed in the assemblage. Primary sources of this stone are presumed to be in the Piedmont, although secondary sources of this stone can occur in river cobble form in the Coastal Plain (Daniel and Butler 1996; Steponaitis et al. 2006). As with quartz in the assemblage, the presence of cobble cortex on some metavolcanic flaking debris at Barber Creek indicates that some metavolcanic stone was acquired from the creek or river adjacent to the site. Chert (2.5%, $n=9$) and a residual category (2.1%, $n=8$) of unidentified materials were present in only minor amounts. Chert is used here to categorize two highly siliceous materials in the assemblage. The first is a gray, jasper-like material that is known to occur in pebble form along the Neuse River (Phelps 1983:22). The

Table 4. Raw material frequencies per size grade at Barber Creek.

Raw Material	Size Grade 1		Size Grade 2		Size Grade 3		Size Grade 4		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Quartz/Quartzite	5	2.1	25	10.5	86	36.1	122	51.3	238	100.0
Metavolcanic	1	0.9	15	13.4	38	33.9	58	51.8	112	100.0
Chert	-	-	-	-	4	44.4	5	55.6	9	100.0
Unidentified	-	-	1	12.5	5	62.5	2	25.0	8	100.0

second is a tan-colored chert whose source is unknown. Unidentified raw materials constitute the residual category with the exception of the single soapstone artifact.

Flakes. Flakes in the assemblage are routinely small (Table 3). Mean flake weight is 1.5 g with 87.1% ($n=320$) of the flakes falling into the two smallest size grades. Nevertheless, the presence of at least 10% of the flakes occurring in the two largest size grades suggests that, at least to some degree, all stages of stone reduction took place at Barber Creek (Potts 2004:25–51). Further distinctions in stage and type of stone working can be inferred when the flake assemblage is examined by size grade, raw material, and the presence/absence of cortex.

Initial stages of stone reduction are suggested for quartz and metavolcanic stone, along with some late stage biface manufacture (Ahler 1989; Morrow 1997). For example, almost half of the quartz flakes in the assemblage are represented in the first three size grades (Table 4). That fact, combined with the presence of cobble cortex on the majority of quartz flakes in size grades 1 and 2 (low sample size notwithstanding), suggests some initial core reduction took place at Barber Creek (Table 5). While one might expect a greater number of flakes to be represented in size grade 1 for initial core reduction, the relative absence of large flakes might be explained by the moderately small package size represented by cobbles used for raw material at the site. In any case, at least some cortex is present in all flake size categories, and the frequency of cortex significantly decreases in the lower two size grades versus the larger two size grades. This pattern too is consistent with on-site continuous cobble reduction. A similar conclusion can be drawn from the metavolcanic flake distribution pattern (Table 5).

Table 5. Presence and Absence of Cortex by Raw Material and Size Grade from Barber Creek.

Raw Material	Cortex	Size Grade 1		Size Grade 2		Size Grade 3		Size Grade 4	
		<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Quartz/Quartzite	Absent	2	40.0	6	24.0	54	62.8	109	89.3
	Present	3	60.0	19	76.0	32	37.2	13	10.7
	Total	5	100.0	25	100.0	86	100.0	122	100.0
Metavolcanic	Absent	-	-	8	53.3	27	71.0	53	91.4
	Present	-	-	7	46.7	11	29.0	5	8.6
	Total	-	-	15	100.0	38	100.0	58	100.0
Chert	Absent	-	-	-	-	3	75.0	5	100.0
	Present	-	-	-	-	1	25.0	-	-
	Total	-	-	-	-	4	100.0	5	100.0
Unidentified	Absent	-	-	-	-	3	50.0	1	50.0
	Present	-	-	1	100.0	2	50.0	1	50.0
	Total	-	-	1	100.0	5	100.0	2	100.0

At least some of this cobble reduction is attributed to biface manufacture, as indicated by the presence of multifaceted platforms and multiple flake scars on the dorsal surfaces of both quartz and metavolcanic stone flakes. Interestingly, a few metavolcanic flakes may represent uniface reduction flakes (Shafer 1970), as indicated by single-faceted striking platforms and low dorsal surface scar counts (Potts 2004:37–40).

Chert flakes, on the other hand, appear to be exclusively associated with biface maintenance. Although few in number, the fact that all chert flakes occur in the two smallest size grades and the presence of other attributes (e.g., multifaceted platforms) on these artifacts are suggestive of late stage biface reduction (Potts 2004:37–40).

In short, there is evidence of core, biface, and probably uniface reduction in the lithic assemblage at Barber Creek. Apparent differences in raw material use are also evident. Core and biface reduction were the most common stone working activities at Barber Creek. Core reduction is evident in only the quartz and metavolcanic stone raw materials, while biface reduction is evident among all stone types. Chert was used only for biface reduction at Barber Creek.

Other Lithic Artifacts. Hammerstone fragments ($n=5$), biface fragments ($n=3$), cobbles ($n=2$), and a single utilized flake comprise the

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remaining assemblage (Potts 2004:44–51). These items were weighed, measured, and morphologically described. Raw material type was also noted. Most of these items represent tool fragments and include bifaces, hammerstones, and a utilized flake. Two quartz biface fragments and one metavolcanic biface fragment appear to be associated with the Archaic component at the site. None of the specimens are particularly diagnostic and appear to be manufacture failures. The metavolcanic specimen is somewhat unusual in that it appears to exhibit a radial fracture. If true, this may represent an attempt to extend the use-life of raw material in areas of limited stone sources (Bruce 2000).

Several hammerstone fragments are present in the assemblage. Four quartz specimens were associated with the Archaic component. Two specimens represent cobble fragments with pitting along the edges. Two other artifacts are tabular in shape. Pitting is present along the artifact edges as well as on the flat surfaces of the stone, indicating that these stones were used as anvils as well as hammerstones. An additional quartz hammerstone fragment was recovered from the Woodland component. A single utilized metavolcanic flake, characterized by use-retouch along one edge, was also identified in the assemblage.

Finally, two small quartz cobbles exhibiting no clear evidence of use are present in the assemblage. They are included in the discussion here because it is hard to imagine how they were deposited on site without having been transported by humans.

In sum, given that chipped-stone debitage comprised the majority of the lithic remains from the site, data analyses focused on drawing conclusions about the nature of stone-working activities conducted at the site. Of course, these conclusions should only be regarded as tentative and are proposed as hypotheses for future testing. First, core, biface, and to a lesser extent uniface reduction probably took place at Barber Creek. In particular, much of the stone working probably included quartz cobble reduction in the form of biface manufacture. The presence of several quartz biface fragments in the assemblage supports this interpretation. Most likely much of this material was obtained from the nearby river. To a lesser extent, metavolcanic stone was also reduced at the site apparently from cobbles as well, although some metavolcanic flakes in the assemblage may represent the product of tool maintenance (i.e., items brought into the site). This is almost certainly the case with chert flakes in the assemblage. Given that chert is a non-local stone and artifacts of

Table 6. Prehistoric Ceramics Types from Barber Creek.

Series	Surface Treatment	<i>n</i>	%
Deep Creek	Cord-marked	79	11.33
	Fabric-marked	30	4.30
	Net-impressed	19	2.73
	Simple-stamped	16	2.30
	Plain	2	0.29
	Indeterminate	133	19.08
Hanover	Fabric-impressed	59	8.46
	Cord-marked	18	2.58
	Plain	3	0.43
	Indeterminate	46	6.60
Mount Pleasant	Cord-marked	17	2.44
	Fabric-impressed	5	0.72
	Net-impressed	2	0.29
	Indeterminate	7	1.00
Indeterminate		261	37.45
Total		697	100.00

this stone occur as small biface thinning flakes, their occurrence at Barber Creek likely represents on-site maintenance rather than initial manufacture of chert bifaces.

Ceramics

The ceramic analysis focused on classifying ceramic sherds by series. A total of 697 prehistoric ceramic sherds were recovered in the shovel tests (Table 6). Of these, 436 (62.5%) potsherds were classifiable as to series. The identifiable ceramics were classified according to the established ware groups for the region: Deep Creek, Mount Pleasant, and Hanover (Herbert and Mathis 1996; Phelps 1983; South 1976). Deep Creek ceramics are associated with the Early Woodland period in the North Coastal Plain (Phelps 1975, 1983:29). The Deep Creek series includes 279 sherds or about 64% of the identifiable assemblage. This total includes ceramics tempered with coarse sand particles and cord marked ($n=79$), fabric-impressed ($n=30$), net-impressed ($n=19$), simple-

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stamped ($n=16$), and plain surfaces ($n=2$). Surface treatments on the remaining 133 sand-tempered sherds could not be confidently identified. The frequencies of identifiable surface treatments in the assemblage are consistent with either a Deep Creek I or Deep Creek II phase placement (Martin 2004; Phelps 1983:29). Over half (ca. 54%) of the Deep Creek assemblage is cord-marked, followed by lesser frequencies of fabric-impressed (ca. 21%) and net-impressed (ca. 13%) sherds. Simple-stamped (ca. 11%) and plain (ca. 1%) surfaces constitute relatively minor amounts of the assemblage.

Lesser frequencies of at least one and possibly two Middle Woodland pottery series are present in the assemblage. The uncertainty of this occurrence at Barber Creek is due to the possible presence of a second sand-tempered ware tentatively identified as Mount Pleasant. Like Deep Creek pottery, Mount Pleasant pottery is sand tempered, but the latter is distinguished from the former by the presence of sand and grit or pebble tempering although some specimens lack pebbles (Phelps 1983:32–33, 1984:41–46). The Mount Pleasant series also exhibit surface treatments similar to Deep Creek. Indeed, Deep Creek is considered the direct antecedent of the Mount Pleasant ceramic tradition (Herbert and Mathis 1996:146; Phelps 1983:33). Only 31 sherds were classified as Mount Pleasant in the Barber Creek assemblage, and they were sand tempered with only occasional larger grit inclusions. Those specimens exhibited cord-marked ($n=17$), fabric-impressed ($n=5$), and net-impressed ($n=2$) surface treatments. Surface treatments on seven Mount Pleasant sherds could not be identified.

Hanover sherds ($n=126$) represent the second most prevalent ceramics in the assemblage (Herbert and Mathis 1996:161–162; South 1976). Although usually considered a southern Coastal Plain pottery type, Hanover wares are not uncommon in the northern Coastal Plain (Herbert and Mathis 1996:163). Hanover ceramics date to the Middle Woodland period and are most common on sites along the coast; however, they have been found at numerous inland sites and often co-occur with Mount Pleasant ceramics (Phelps 1983:32). Hanover ceramics are typically clay- or grog-tempered and frequently exhibit fabric-impressed surface treatments. Hanover sherds in the assemblage have a rather compact paste with lumpy interior surfaces; clay temper particles occasionally protrude through sherd walls. The Hanover ceramics recovered from Barber Creek generally fit into the "typical" Hanover type with clay tempering and fabric-impressed surface

treatments ($n=59$). Lesser frequencies of cord-marked ($n=18$) and plain ($n=3$) surface treatments are also present in the assemblage. Surface treatments on 46 Hanover sherds could not be classified.

In sum, the ceramic assemblage appears to document a significant Early Woodland component at Barber Creek. As such, it is one of the few such components yet identified in the Coastal Plain and will likely yield data necessary to refine our understanding of Woodland ceramic typologies (Herbert 2002; Martin 2004; Phelps 1983). In particular, data likely exist to test a proposed three-phase Deep Creek pottery sequence characterized by trends in the frequencies of various surface treatments (Phelps 1983:29–32). Other typological issues that might be addressed include studying trends in surface treatment frequencies in the Hanover series.

Spatial Patterns

Artifact data from the 94 shovel tests dug during the summer of 2000 were used to address the question of site boundaries and to identify potential intrasite differences in site structure. The computer program SURFER (2002) was used to generate Figures 10, 11, and 12. Shovel test data were smoothed using a kriging method and essentially depict artifact densities across the site. Kriging is a geostatistical gridding method that produces visually appealing maps from irregularly spaced data (Cressie 1991). Kriging attempts to illustrate data trends such that high points might be connected rather than isolated by bull's-eye type contours. For present purposes, the maps produced here essentially depict artifact densities across the site.

With respect to site boundaries, the distribution of total artifact counts by shovel tests suggests that site limits are largely isomorphic with the ridge, covering about 1 ha (Figure 10). Seventy-nine shovel tests contained artifacts. Total artifact counts range from 0 to 49 per shovel test with a median of 7 and mode of 0. Artifacts are distributed over the entire sand ridge with the greatest densities scattered along its crest and southern border. Shovel tests lacking artifacts and bordering the adjacent field suggests the northern limits of the site have been identified. The southern edge of the site is probably marked by the creek floodplain although no shovel tests were placed in the floodplain to confirm this notion. East and west boundaries of the site are less certain since shovel testing in those directions was limited by property

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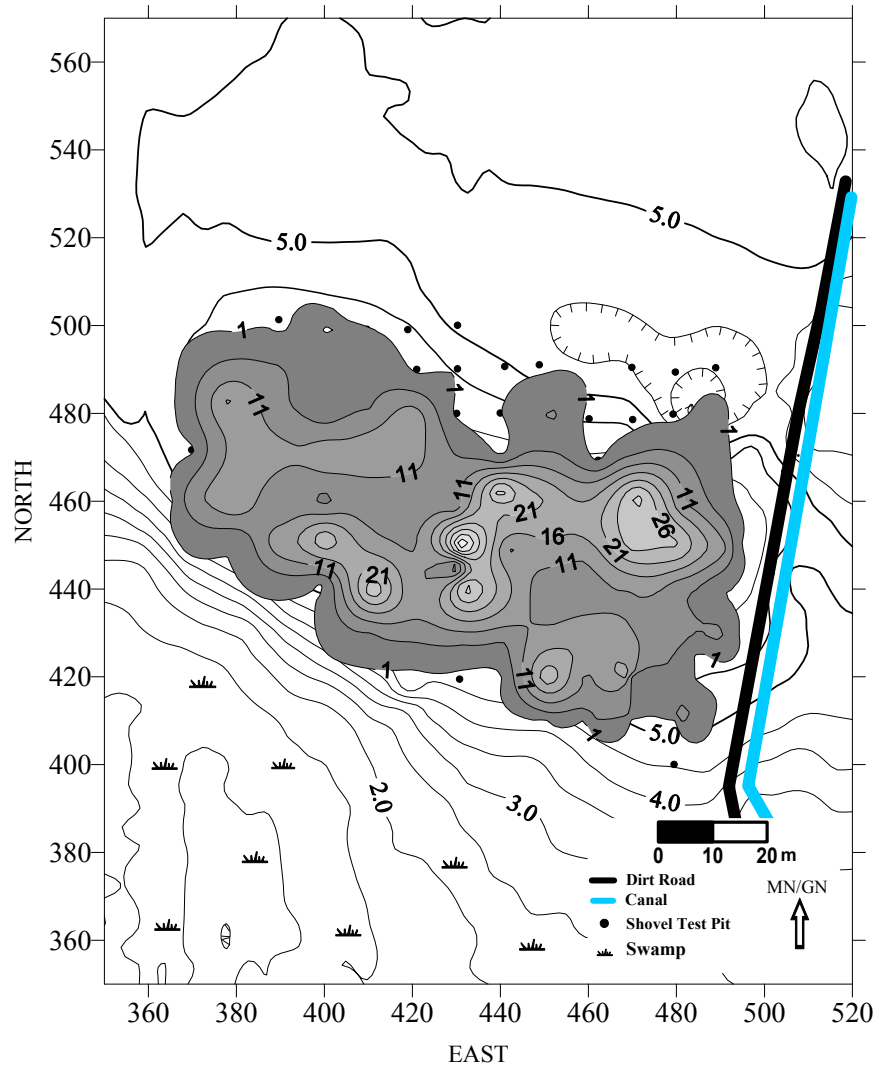


Figure 10. Spatial distribution of total artifact counts from shovel tests at Barber Creek. (Artifact interval = 10, except first interval =1).

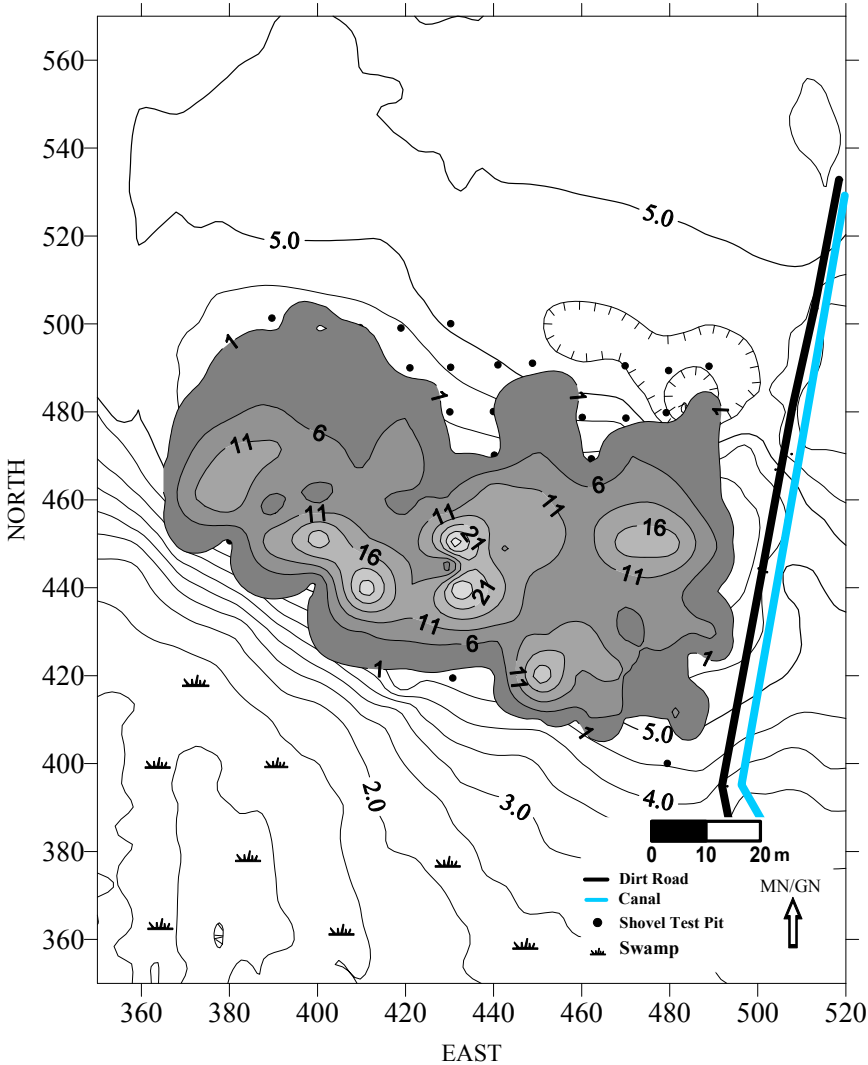


Figure 11. Spatial distribution of total artifact counts from Woodland component at Barber Creek (Artifact interval = 5, except first interval = 1).

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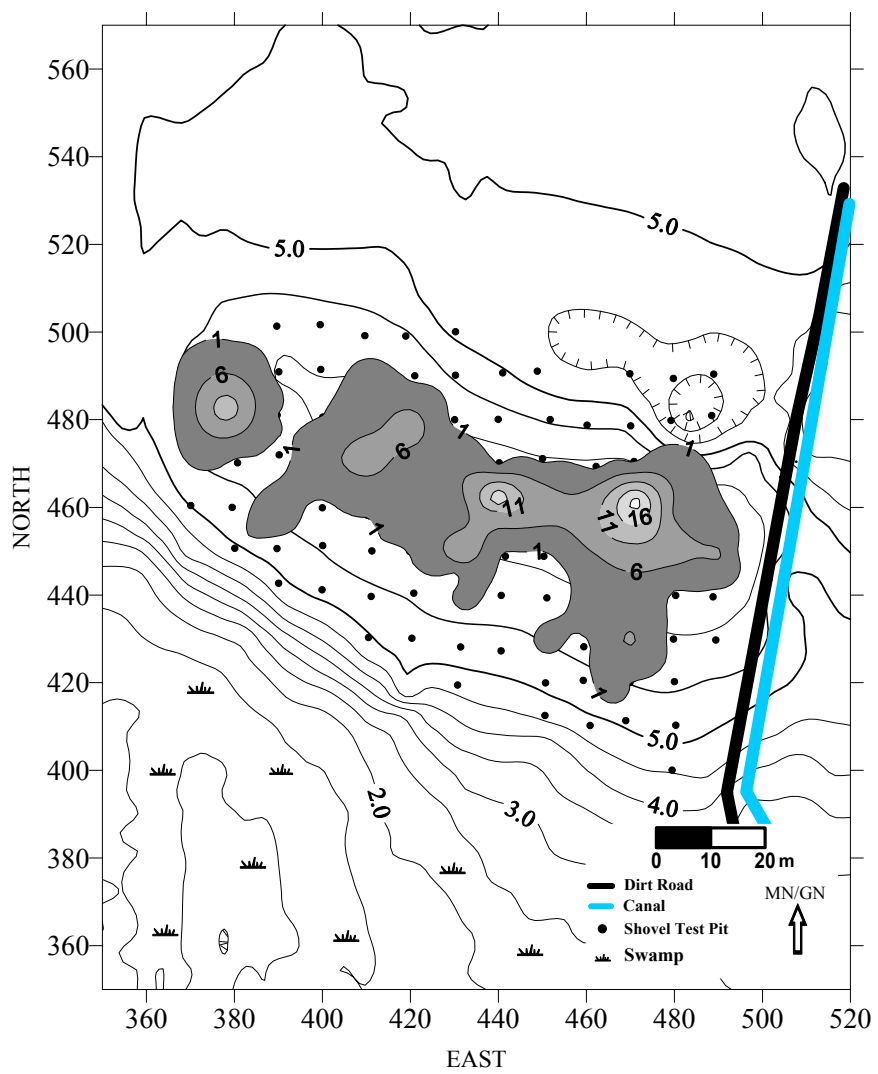


Figure 12. Spatial distribution of total artifact counts from Archaic component at Barber Creek (Artifact interval = 5, except first interval = 1).

boundaries. Nevertheless, it appears that the vast majority of the site was tested given that artifact frequencies decline in both directions where the limits of the ridge are quickly reached.

Potential intrasite differences in the spatial patterning of the Archaic versus Woodland components were also explored. Generally, intrasite spatial patterning is best seen by combining shovel test artifact totals from the first two levels (representing the Woodland component) and comparing those artifact distributions with the distribution of artifact totals from the bottom two levels (representing the Archaic component) (see also Potts 2004:53–67). Figure 10 depicts the spatial distribution of total artifact counts (ceramics and lithics) from levels 1 and 2 for all shovel tests. Ceramic artifacts ($n=87$) from levels 3 and 4 are also included in this distribution. While including ceramics from the lower two levels in this distribution does bias level comparisons, this bias is mitigated by the fact that ceramics are temporally diagnostic of the Woodland component which this figure is interpreted to represent.

Seventy-eight shovel tests contained artifacts from the Woodland component (Figure 11). Artifact counts range from 0 to 37 with median and mode values of 6 and 0, respectively. Spatially, the artifact distributions mirror that of Figure 10, suggesting the Woodland component is relatively dense compared to the Archaic component (see below). Thus, the Woodland component covers much of the ridge but relatively higher artifact densities are present along the southern half of the site paralleling the swamp. Whatever activities these artifact distributions represent, it would appear they were concentrated along the portion of the site bordering the creek floodplain.

This pattern contrasts with that of the spatial distribution of lithic artifacts from the shovel tests' lower two levels (Figure 12). Overall, counts range from 0 to 24 with median and mode values of 0. Far fewer shovel tests ($n=38$) yielded artifacts from the Archaic component. Moreover, those shovel tests mostly occur along the length of the ridge crest. This spatial distribution suggests that the Archaic use of the site was more spatially restricted and focused on a different portion of the ridge than the Woodland occupation.

Taken together, then, the shovel test data indicate the presence of broad-scale patterning between the Archaic and Woodland occupations at Barber Creek. Archaic use of the site was spatially less extensive than

the Woodland occupation, being confined primarily to the ridge crest. And while the Woodland component spatially overlaps the Archaic occupation, the Woodland occupation was concentrated along the southern edge of the ridge.

Conclusion

In their recent review of North Carolina archaeology, Ward and Davis (1999:226–228) make an important point about the paradox that is Coastal Plain archaeology. This region has received more archaeological attention than any other area of North Carolina, yet is perhaps the least understood archaeological region in the state. As the authors also point out, there are two reasons for this paradox. First, development rather than design has largely driven the archaeology that has taken place. While archaeologists justifiably have been preoccupied with keeping ahead of the huge development that the coast has experienced, cultural resource management surveys and excavations alone are unlikely to provide the data necessary to help refine Coastal Plain sequences to that comparable with the Mountains and Piedmont. In short, we collect ever-greater amounts of data under the dictates of modern land use at the expense of interpretive frameworks that have not kept pace with the volume of dirt moved by salvage excavations. Second, Ward and Davis (1999:226) also note the archaeological record itself presents its own challenges on the coast with the absence of stratified sites, poor organic preservation, and poor archaeological context in general—particularly in regard to Archaic period sites.

In the absence of such data, a reliance on the Piedmont cultural-historical sequence has provided some help in this respect. But at some point the archaeological record of the Coastal Plain must be regarded on its own terms (Phelps 1983:13). Indeed, if the experience of researchers in the South Carolina Coastal Plain is any indication, the North Carolina Piedmont typology may have only limited applicability in eastern North Carolina. In this regard, we would suggest that if current work along the Tar River is any indication, then the search for stratified early to middle Holocene sites with sufficient depth and/or integrity to address substantive issues of the region's archaeology is more likely to be successful further inland rather than along the coast *per se* (Moore et al. 2007). Continued work at Barber Creek and other relict dune locations should contribute significantly to our understanding of Coastal Plain chronology, typology, and geoarchaeology.

Notes

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