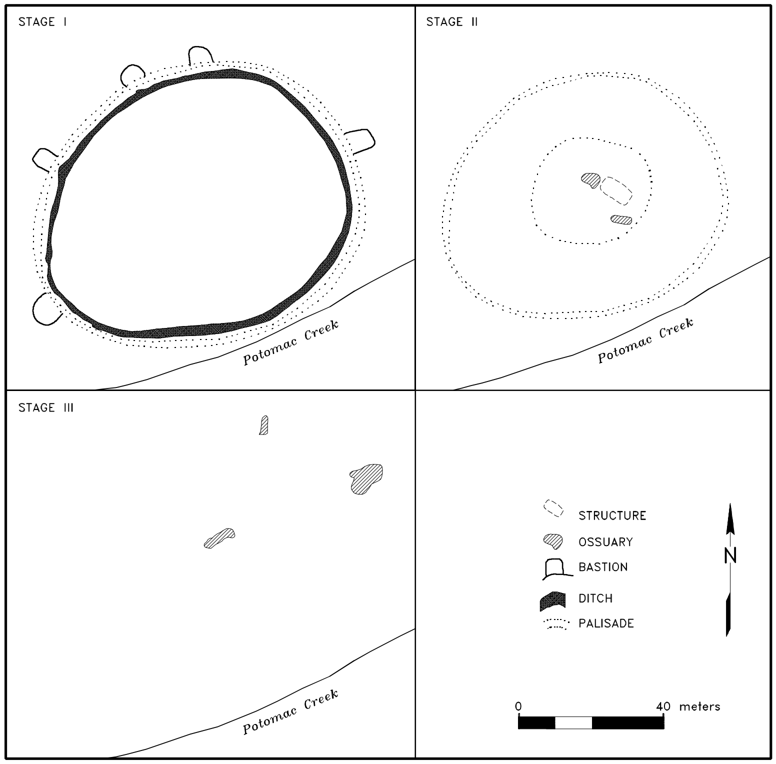
THE POTOMAC CREEK SITE (44ST2) REVISITED



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THE POTOMAC CREEK SITE (44ST2) REVISITED

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Prepared by:
William and Mary Center for Archaeological Research
Department of Anthropology
The College of William and Mary
Williamsburg, Virginia 23187-8795

Project Director
Dennis B. Blanton

Authors
Dennis B. Blanton
Stevan C. Pullins
Veronica L. Deitrick

with contributions from:
Gwenyth Duncan
William C. Johnson
Lisa Kealhofer
Justine K. McKnight

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This volume is dedicated in memory of

Thomas Dale Stewart (1901–1997)

ABSTRACT

Under agreement with the Virginia Department of Historic Resources (DHR), the William and Mary Center for Archaeological Research (WMCAR) completed a second stage of data recovery in a portion of the Potomac Creek Site (44ST2) in Stafford County, Virginia. The fieldwork for this effort was completed in November and December, 1996. It followed completion of the first stage by Cultural Resources, Inc. which consisted of sampling and removal of plowzone to identify cultural features. The WMCAR work resulted in systematic sampling of each cultural feature identified. These include sections of a perimeter ditch, four palisade post lines, nine palisade trench lines, five pit features, and one structure. Radiocarbon dates establish occupation between AD 1300 and 1550. A model is presented of village evolution that accounts for an initial immigrant group and eventual adjustments to local conditions, including chiefdom-level organization. Patterns of subsistence are documented along with material culture.

ACKNOWLEDGMENTS

We want to recognize the support of the project sponsor, the Virginia Department of Historic Resources, and particularly the enthusiasm and assistance of David K. Hazzard, Director of the Threatened Sites Program, and Robert Jolley, archaeologist at the Winchester Regional Office of DHR. The experience was extraordinary in many respects, but one of the more positive was the outstanding cooperation of the property owner, Mr. Buddy Oden. Buddy was accommodating in every sense and remained nonplused over the prolonged construction-site appearance of the place. We wish that everyone were so helpful. The longstanding interest and scholarly contributions of T. Dale Stewart and Howard MacCord are duly acknowledged. Without the pioneering work of these individuals, our results would have been much diminished in scope. Bill Johnson (Michael Baker, Jr., Inc.) very generously enlightened us of the potential of cord twist studies, donating considerable time to examine a sample of ceramic sherds from our excavations, the results of which are included herein. There is a legion of others that volunteered their time to see that the work was completed. These include a great many Archeological Society of Virginia members. A standout among them was Jack Edlund who devoted many, many hours in the field and managed to be contagiously enthusiastic all along. Special recognition is also due Shirley “Little Dove” Custalow McGowan, and her son Samuel, representatives of the Mattaponi tribe. Shirley not only shared her understanding of native culture with us and with visitors to the open house, but pitched in to help with the work on more than one occasion. Students, teachers, and parents from King George Elementary School contributed mightily to the excavations and elevated our enthusiasm a notch more. Colleagues from James River Institute for Archaeology in Williamsburg also contributed their skill and knowledge to the field effort. Christine Jirikowic was kind enough to pay us a visit, not only to help with the digging but also to avail us of her knowledge of Potomac Creek issues, especially of the ceramic kind. The neighbors along Indian Point Road made us feel welcome and frequently stopped by to offer moral support and remind us with their questions of what matters most. Our colleagues at Cultural Resources, Inc. in Williamsburg, Virginia, who preceded us on this project, were most helpful with information and support. Finally, helpful comments on the draft version of this report were received from Howard MacCord, and from Randolph Turner and Bob Jolley of the Department of Historic Resources.

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CHAPTER 1: Introduction

Evidence of prehistoric and historic Native-American occupations in the area of Indian Point in Stafford County, Virginia, including the Potomac Creek Site (44ST2), has captivated Mid-Atlantic antiquarians and archaeologists since the late nineteenth century. The glimpses have been at the same time spectacular, vital, and anomalous. Studies of the evidence have been sporadic over this period, with intensive and large-scale excavations only occurring between 1935 and 1940. The cumulative results of the various investigations have given present-day archaeologists considerable grist for the interpretive mill, but a deficit of facts that are essential to most contemporary studies has hindered progress. This project has provided an opportunity to place interpretation of the Potomac Creek Site on firmer ground, and along with it our understanding of late prehistoric cultural dynamics in the Mid-Atlantic region.

The work reported herein was sponsored by the Virginia Department of Historic Resources (DHR) and was conducted by the William and Mary Center for Archaeological Research (WMCAR). The study consisted of archaeological data recovery in a portion of the Potomac Creek Site (44ST2) in Stafford County, Virginia, and included feature excavation, mapping, and laboratory analysis. The investigation was prompted by plans for a septic drain field in the northwestern quadrant of the site, and this stage of fieldwork was carried out in November and December, 1996. An extension was granted by the DHR in 1997 to expand the analysis of lithic artifacts and paleobotanical remains, and to add a phytolith study.

The 34 × 18.5 m drain field parcel was first investigated in May 1996 by Cultural Resources, Inc. (CRI) through systematic plowzone sampling, machine stripping of plowzone, and feature mapping (Outlaw and Tyrer 1996). The exposed area was covered with plastic until the WMCAR data recovery was started. The CRI work revealed an area in the northwest portion of the site partially investigated between 1935 and 1940 by Graham and Stewart (Stewart 1992). Features identified included five palisade lines, eight narrow trenches, a midden-filled ditch, two possible hearths, numerous scattered posts, and other unidentified anomalies. Filled excavation units from the earlier work were also identified.

SITE LOCATION AND SETTING

The Potomac Creek Site is located on the southern margin of a peninsula between the Potomac River on the east and Accokeek Creek on the west (Figure 1). Two spit-like points nearby are local landmarks: Marlborough Point to the east and Indian Point to the southwest. This end of the peninsula overlooks the confluence of Potomac Creek and the Potomac River, which forms a rather broad cove-like embayment south of the site. Accokeek Creek joins Potomac Creek at Indian Point where the later, historic-period village of Patawomeke is documented. Today, the waters of Potomac Creek offshore of 44ST2 are open, with the deeper channel lying closer to the site than to the uplands on the opposite shore. The mouth of Accokeek Creek is very shallow today, and extensive freshwater, tidal wetlands are common just upstream.

Development is steadily encroaching upon the site, and conditions now contrast markedly with those that characterized the area 60 years ago when Graham and Stewart were at work. In the mid-1930s, Manson reported that the site area was under cultivation (MacCord 1991). Today, the open farmland has been largely replaced by residential housing. The Indian Point Site (44ST1) representing the village of Patawomeke has been entirely lost to erosion and development. A 40 year-old house now occupies the southern half of 44ST2, and others are close by to the north and east (Figure 2). The eastern third of Mr. Oden’s property, where a

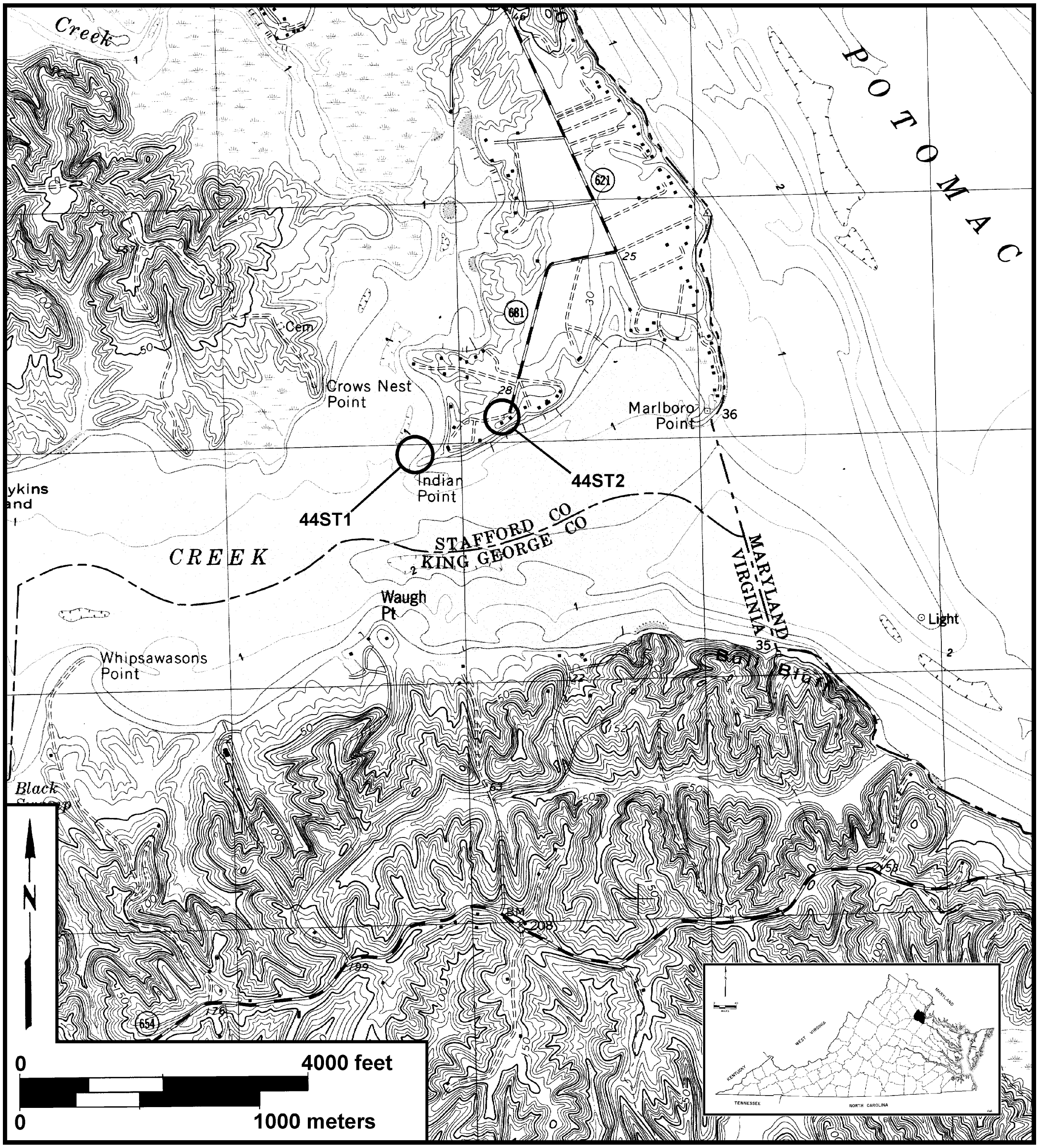


Figure 1. Site 44ST2, location within Virginia and topography of environs (USGS 1982).

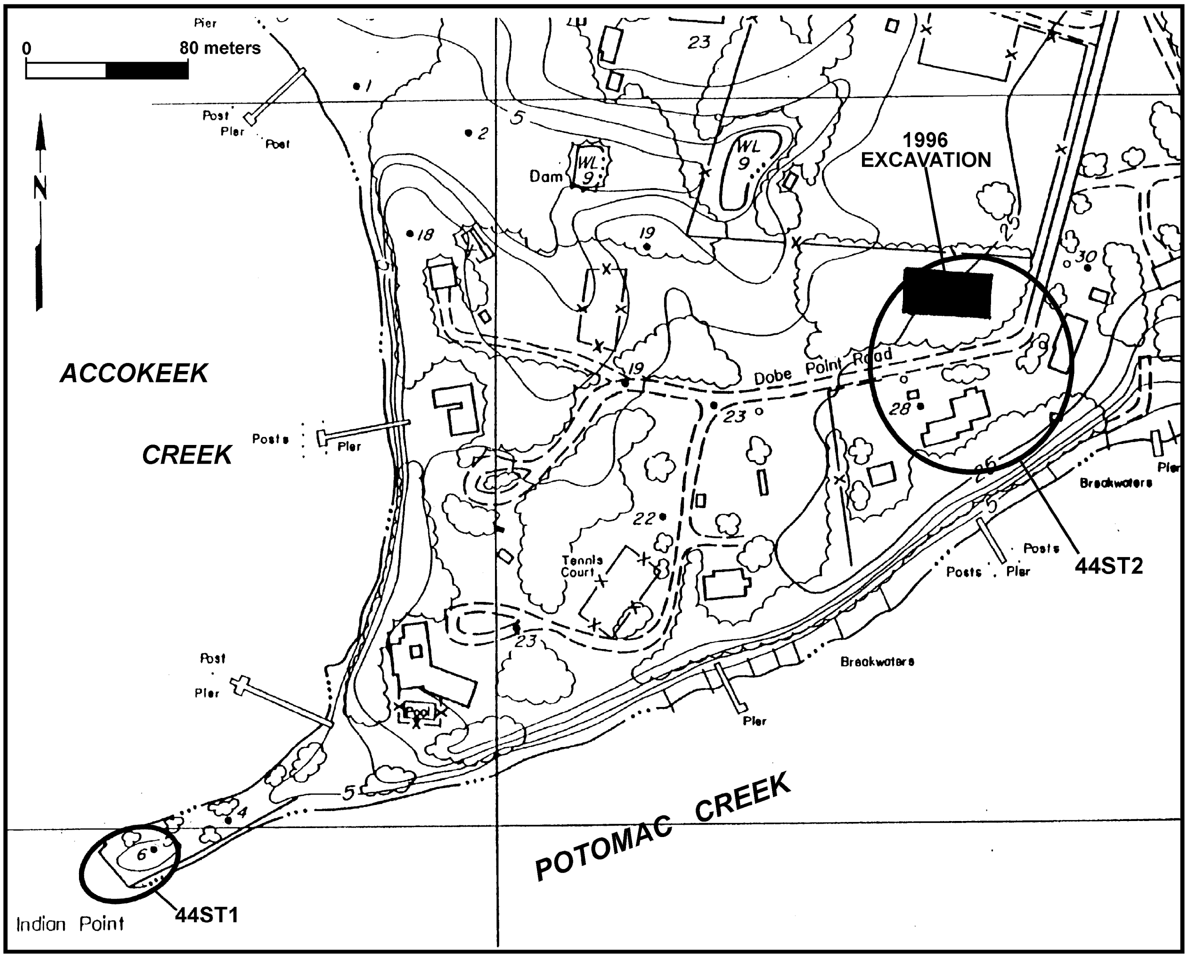


Figure 2. Detail of project area (county road plan).

portion of 44ST2 is located, remained undeveloped at the time of this investigation and was overgrown in second-growth trees and shrubs. His parcel is approximately 50 m wide and lies between Indian Point Road on the east and south and a fenced property line to the north.

Topographically, the peninsula supporting the site is relatively level and averages between 7.5 and 9.0 m above mean sea level (amsl) (see Figure 1). The margin is abrupt and marked by steep bluffs. Ravines occur around the perimeter but are more frequent at the western margin, draining into Accokeek Creek. One such ravine extends nearly to the northwestern edge of the site. Springs are reported to have issued from the bluff edge below the site (MacCord 1991). Soils at the site are classified by the U.S. Department of Agriculture (Isgrig and Sobel 1974) as Sassafras fine sandy loam and Craven loam. Sassafras Series soils are described as deep and well drained, with acidic to highly acidic subsoils. The native vegetation they support is typically oaks, hickory, and yellow poplar. They are cited as low in natural fertility and organic matter content, but are good for local crops when fertilized and limed. Craven Series soils are also deep and well drained but form in clayey sediments, also with acidic subsoil. Oaks and hickory are the dominant native vegetation. The natural fertility of Craven soils is low like adjacent Sassafras soils. The opposite shore of the mouth of Potomac Creek, to the south, is a starkly different landscape. Strongly dissected uplands occur there that range in elevation from 7.5 m to more than 46 m amsl.

Rountree (1996) has recently reviewed the aquatic resources available today in sections of the Chesapeake estuary. Salinity in this portion of the Potomac drainage is low (less than 10 ppt at any season) and is variably classified as fresh to brackish. Generally freshwater, edible plants such as arrow arum (*Peltandra virginica*) occur in the area's wetlands. Presently, the Potomac Creek confluence is above the limits of American oyster (*Crassotrea virginica*) and hard clam (*Mercenaria mercenaria*) occurrence in the Potomac basin. Species of finfish like striped bass, shad, and herring do spawn in the waters near the site, however.

The conditions prevalent today only approximate those of the late prehistoric and early historic periods. Sea level has risen since the Pleistocene in the Chesapeake estuary and the rate appears to have increased over the last four centuries (Kraft 1985:114). Accounting for this fact would probably mean lower salinity and perhaps less extensive wetlands characterized the area at the time 44ST2 was occupied.

PREVIOUS SITE-SPECIFIC RESEARCH

This section will provide a general context for the site, that is really a simple summary of the more thorough treatments cited above. Background research conducted as part of this project relied heavily on prior scholarship concerning not only this site but the region. Key references include Stewart (1939, 1940, 1941, 1992), Schmitt (1965), MacCord (1991, 1992), Clark (1980), and Potter (1993).

Site 44ST2 and the surrounding Indian Point area have attracted an unusual amount of attention over the last century or so. The three factors that have drawn this archaeological interest are (1) the archaeological richness of the site, (2) the apparent association of the sites to historical places and events, and (3) the relative proximity to Washington, D.C. and the Smithsonian Institution. Recent scholarship identifies this site as ancestral to nearby 44ST1 that was occupied during the fully historic period. Both sites are viewed as the principal Patawomeke sites where the local weroance resided. They are also recognized as manifestations of the intrusive Potomac Creek complex that appears on the lower Potomac in the fourteenth century.

As noted, the historical significance of this location to early English-Indian relations has been among the most important aspects to attract scholars, and this link has also long been a compelling point of reference for archaeological interpretations. Application of the "direct historical approach" in Potomac Creek Culture studies has not always been advantageous, however. This emphasis has led to an underestimation of the site's dates and complications in the explanation of Potomac Creek cultural origins.

Historically, Indian Point was the location of the principal settlement of the Patawomeke, first described by Captain John Smith following his explorations of the Chesapeake Bay in 1608 (Smith 1986a) (Figure 3). The village occupied at that time is recognized now as 44ST1, formerly only 350 m southwest of 44ST2 at the terminus of Indian Point but since lost to erosion and development. The English enjoyed relatively good and long-term relations with the Patawomeke, and relied on them for large quantities of corn. Notable events in the vicinity of this historically known settlement include the capture of Pocahontas in 1613 and the massacre of many natives in 1622 by English garrisoned at Site 44ST1. Table 1 provides a summary chronicle of key historical events recorded in documents, based on information provided by MacCord (1992).

Site 44ST2 is known almost entirely through archaeology, as it had been abandoned before English contact for the new village at 44ST1. Intensive exploration of the site was initiated in 1935 by Judge William J. Graham. His work piqued the interest of archaeologists, namely T. Dale Stewart of the Smithsonian Institution, who took up formal excavations in 1938 that continued in the summers through 1940. Karl

9000–1000 BC	Occasional Archaic occupations.
1000 BC–AD 900	Occasional Early and Middle Woodland occupations.
AD 900–1300	Sporadic Late Woodland (Townsend) occupation.
AD 1300	Initial settlement of 44ST2 by Piedmont region immigrants (former Montgomery Focus groups?); beginnings of the Potomac Creek Culture in eastern Virginia.
ca. 1600	Village moves short distance to Indian Point (44ST1).
1608	Initial visit by English under Captain John Smith during explorations from Jamestown; followed by numerous visits over several years by English to trade for corn.
1613 (spring)	Captain Samuel Argall captures Pocahontas during a trading visit, with the help of Patawomeke chief Japazaws; Pocahontas eventually meets John Rolfe at Henricus, and they are later married.
1619 (December)	Captain Ward takes 800 bushels of corn by force.
1622 (spring)	Patawomeke do not participate in organized native attack and refuse to kill English living among them.
1622 (summer)	Patawomeke sign agreement to ally themselves with the English against Opecancanough (Powhatan). Captain Croshaw (and later a Captain Madyson) along with other English remain with Patawomeke and build a fortified house (at the site?). Captain Madyson turns on Patawomeke, killing 30–40 and burning the village.
1634	Lord Calvert and Father John Altham of Maryland visit the village.
1642	Father Andrew White visits for seven weeks, baptizing several natives including the chief.
ca. 1650	Gradual abandonment of the village and general area, primarily to live among groups like the Potopacos on the Rappahannock to the south.
1650	Potomac Neck area patented to John Rookwood and later to Giles Brent.

Table 1. A chronicle of Patawomeke (after MacCord 1992).

Schmitt (1952) produced a Master's thesis on the site in 1942 focusing on the late prehistoric occupation. Stewart issued a site report in 1992 that summarizes both his extensive work and that of Judge Graham before him (Figure 4). The better-known aspect of his work are descriptions of several ossuaries. The most important contributions of Schmitt and Stewart are thorough descriptions of material culture and the village plan that eventually came to steer interpretations away from the historic period.

The recovery of several spectacular artifacts of obvious European origin at Indian Point sites long perpetuated the notion that virtually all of them had post-contact occupations. The first to gain renown is the remarkable cache of burial items taken from 44ST1 in 1869 (MacCord 1991; Potter 1993). Along with the group of engraved shell maskettes of native manufacture, were copper disks and beads, brass bells, a white metal crucifix, and an earthenware bowl of European manufacture. Later, the burials opened by Graham at

Figure 3. Detail from John Smith's 1612 map of Virginia (Smith 1986a).

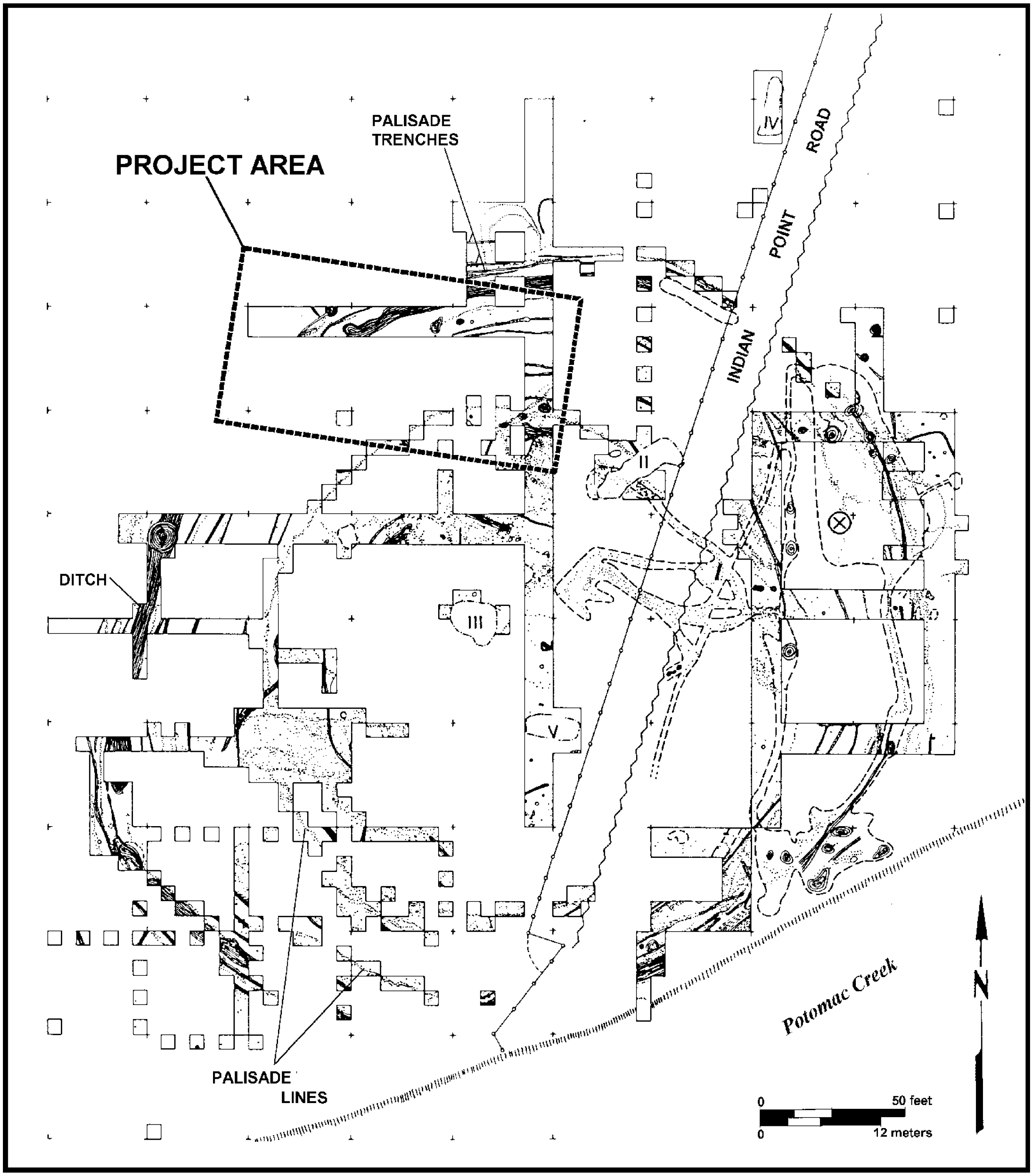


Figure 4. Site 44ST2, location of excavation area on Stewart's site plan (from Stewart 1992).

44ST2 yielded another impressive array of European trade items. From one multiple burial and Ossuary I numerous glass beads, bells, a bone comb, copper chain, scissors, buttons, and a jeton were recovered (Stewart 1992). Stewart did eventually conclude, however, that the trade material from 44ST2 post-dated the occupation there.

Other work at this site was conducted in 1957 by Carl Manson, and augmented in 1983 by Howard MacCord (Manson and MacCord 1985), designed primarily to place the occupation in the regional cultural sequence with a stratigraphic record. Manson and MacCord (1985) document ceramic attribute changes in the sequence such as an increase in the frequency of plain, finely tempered wares at the expense of grit-tempered, cord-marked wares, and a decline in the frequency of thickened rims. The early parallels with Montgomery Focus material culture inspired the conclusion that the Potomac Creek Culture was derived from this Piedmont-based population. Also in 1957, limited excavation at the uneroded remnant of 44ST1 was carried out by Manson, in which palisade lines and scattered posts were documented.

The archaeological history of the Potomac Creek Site is summarized in Table 2. What these studies had established, or at least indicated, prior to the outset of our work was that:

1. the principal occupation of the site occurred during the late prehistoric period and that burials with European trade material are secondary, post-occupational features (the historic period village was at nearby 44ST1);

2. the site was a strongly fortified and intensively occupied village;

3. occupation had persisted over a long span, during which the village footprint had been altered and material culture change had occurred; and

4. that the Potomac Creek Culture had affinities with populations north or west of the Virginia Coastal Plain.

OVERVIEW OF POTOMAC CREEK CULTURE STUDIES

Scholarly interest in the Potomac Creek Culture has been intensive over the last 50 years, and several archaeologists have devoted considerable portions of their careers to understanding it. Prominent among them are Howard MacCord (1984, 1991, 1992), Carl Manson (and MacCord 1985), Wayne Clark (1980), and Stephen Potter (1993). Their published work provides a corpus of descriptive and interpretive studies essential to an understanding of this archaeological record. Their contributions will only be summarized here, with emphasis placed on the leading interpretations.

The Potomac Creek Culture has been defined through archaeology at the Potomac Creek Site (44ST2) and the village of Moyaone (18PR8) at the Accokeek Creek Site in Prince George's County, Maryland (Stephenson et al. 1963) (Figure 5). Both sites are large, palisaded villages that in terms of plan and material culture are virtual duplicates. The strength of the parallels between them quickly led to a trait-based definition of a distinct cultural "focus" (Schmitt 1952, 1965). Table 3 summarizes key traits common to the two sites. Potomac Creek survives today as an accepted archaeological construct, defined largely on the traits listed by Schmitt nearly 50 years ago.

The most fundamental but challenging question that persists in Potomac Creek studies is that of origins. Beginning with Schmitt (1965), recognition of the lack of a local antecedent for Potomac Creek, and

1869	“Gentlemen” excavate eroding ossuary at Indian Point (44ST1?); most notable interment with 9–10 shell gorgets including maskette style, six copper disks, copper and shell beads, European brass bells, a white metal crucifix, a pipe, and an earthenware vessel. Findings reported by Reynolds (1883) at Anthropological Society of Washington (McCary 1958; MacCord 1991; Potter 1993).
ca. 1891	Edward S. Ruggles excavates burial at Doag Point site just north of Indian Point; described as flexed burial in small pit with a copper breastplate and beads, glass beads, and a clay pipe. Findings recorded by William H. Holmes in notes on file at National Anthropological Archives (File 2619-B), perhaps after he visited the site (MacCord 1991).
1934–1935	Richard Slattery and Carl Manson “discover” and explore 44ST2 through surface collection and “shallow digging” until Graham begins investigations (MacCord 1991).
1935–1937	Judge William J. Graham explores 44ST2 with selective, uncontrolled excavations; exposes five ossuaries, some with European artifacts. Invites T. Dale Stewart of the Smithsonian Institution to visit the site (MacCord 1991; Potter 1993; Stewart 1992).
1937–1940	T. Dale Stewart of the Smithsonian Institution takes over excavations at 44ST2; explores sections of entire site by systematic excavation (MacCord 1991; Potter 1993; Stewart 1939, 1940, 1941, 1992).
1942	Karl Schmitt, a field assistant to Stewart in 1940, summarizes work at 44ST2 for his Master’s thesis at the University of Chicago. He provided a description of Potomac Creek Culture in 1952 for Griffin’s *Archaeology of Eastern North America*; a revised version of the thesis was published in 1965 as Volume 20 (No. 1) of the *Quarterly Bulletin of the Archeological Society of Virginia* (Griffin 1952; MacCord 1991; Schmitt 1952, 1965).
1957	Carl Manson opens several 10-ft. units at both 44ST1 and 44ST2 with screened samples recovered. At 44ST1, he recovers glass artifacts and records features that include arcuate post and trench patterns (MacCord 1984; Manson and MacCord 1985; MacCord 1991).
1983	Howard MacCord conducts additional stratigraphic excavation at the southern margin of 44ST2 to document a relative chronology for the site (Manson and MacCord 1985).
1992	T. Dale Stewart publishes final report of his investigations at 44ST2 (Stewart 1992).
1994	David Hazzard and Robert Jolley (DHR) employ shovel testing to locate and mark previously identified ossuary locations just north of 44ST2 so they could be avoided by a proposed septic drain field.
1996	The Virginia Department of Historic Resources sponsored an archaeological assessment of a portion of 44ST2 slated for drain field construction; in May Cultural Resources, Inc. systematically sampled the plowzone and exposed features in this area at the northwest perimeter of the site (Outlaw and Tyrer 1996); in winter the William and Mary Center for Archaeological Research completed data recovery in the drain field tract.

Table 2. Summary of archaeological investigations at Indian Point.

Village Plan
- Palisades with driven posts
- Palisades with posts in trenches
- Bastions attached to palisades
- Ditch encircling the site and filled with midden

Agriculture
- Presumed

Ceramic Vessels
- Jar forms predominate
- Miniature vessels common
- Coarse lithic temper predominant
- Sand and shell temper rare
- Cord-marked surfaces predominant
- Smoothing common
- Cord impressed decoration common
- Cord-wrapped dowel decoration common
- Pseudo-cord decoration common
- Punctate and incised decoration rare

Pipes
- Obtuse angle
- Circular stem cross-sections most common
- Tapered, cylindrical and expanded bits
- Roulette decoration common (usually geometric)

Lithic Artifacts
- Pitted stones common
- Small triangular points common
- Split quartz pebble scrapers common

Burials
- Bundle burial in ossuaries common

Table 3. Summary of key traits defining the Potomac Creek Complex (after Schmitt 1965).

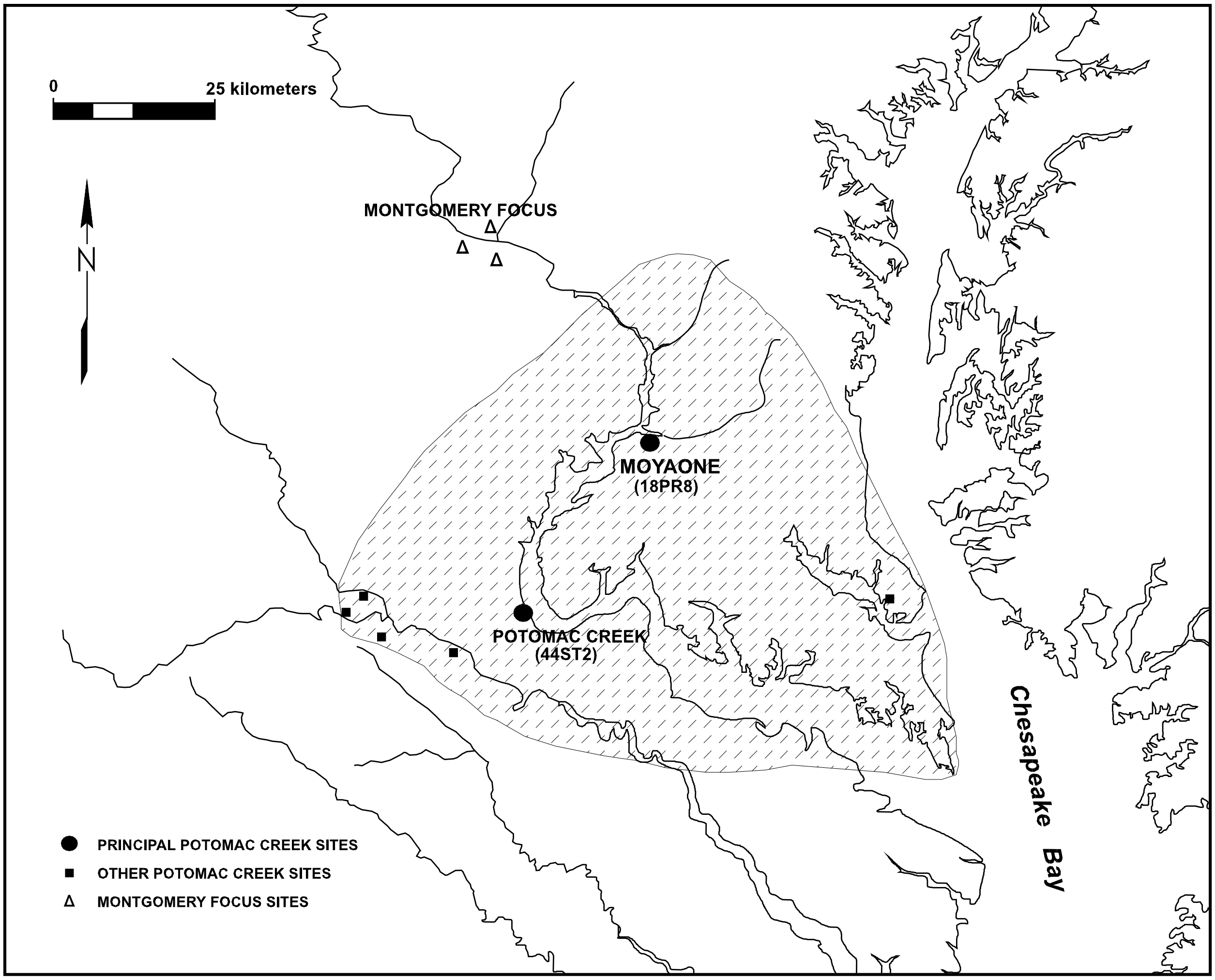


Figure 5. Locations of major Potomac Creek and Montgomery Focus sites.

its closer material similarities to Piedmont cultures instead, has required explanation. Schmitt (1965:30) closes his latest paper by stating that, "there was a general similarity of material culture—noticeably pottery and pipe traits to that of the Owasco aspect of New York, indicating a diffuse relationship to that archaeological manifestation." He avoids an appeal to migration to explain the parallels, but persists in maintaining "that the culture of the inhabitants exhibited a basically northeastern type of material adaptation but was influenced ...[by] southeastern groups."

Schmitt (1965:30) was also the first to suggest that there may be a clue, if not a direct link, to Potomac Creek origins in what is now known as the Montgomery Focus. He makes this connection to identify a likely cultural origin in the absence of a local antecedent. MacCord and others (MacCord 1984, 1992; Slattery and Woodward 1992) have since formalized this origin theory. Montgomery Focus sites cluster along the Potomac River in Piedmont Virginia and Maryland. They typically represent horticultural villages dating between AD 1000–1300.

Stephen Potter (1993:126–138) has defined the three competing hypotheses of Potomac Creek origins under consideration today. The most widely favored is the "Montgomery Complex Hypothesis." Ceramic traits similar to Potomac Creek wares and an estimated terminal date in the late thirteenth century are the underpinnings of the Montgomery origin hypothesis. The notion is that this population was forced out of its Piedmont territory, perhaps by what are now referred to as Mason Island groups, after which it took up residence in the tidewater Potomac to become what we refer to as Potomac Creek Culture (see Figure 5).

The idea is another one that we can trace originally to Schmitt (1965) and, as Potter indicates, it has been endorsed subsequently by MacCord et al. (1957, 1984), Clark (1980), and Gardner (1986). The Shepard ceramic wares on Montgomery sites commonly exhibit thickened rims and decorative motifs of the kind also known on Potomac Creek vessels. The parallels are more often than not just that, rather than precise duplications, and Kavanaugh (1982) has reminded us that the similarities extend beyond just these two complexes. Like Schmitt, she also notes strong similarities with Owasco pottery.

Potter (1993:128–129) points out two dissimilarities between Montgomery and Potomac Creek traits. One is house form, which at Montgomery sites appears to be circular in contrast to the more oval Potomac Creek structures. The other difference is the tendency for Montgomery burials to be individual interments as opposed to the multiple burials typical of Potomac Creek.

Also under consideration is the "Eastern Shore Hypothesis" put forth by Paul Cissna (1986). It is derived from oral tradition and linguistic evidence, that strongly links Eastern Shore Nanticoke and Delaware populations. The former are claimed to have separated from the Delaware to the north and after moving south eventually subdivided to also form the Piscataways. Linguistic and archaeological evidence is supportive of these lower Delaware-northern Eastern Shore connections. Here again, ceramic design motifs exhibit similarities sufficient to indicate a link between related Eastern Shore groups and Potomac Creek people in the late prehistoric period (Potter 1993:133).

The least favored of the potential explanations is the "In Situ or Local Development Hypothesis." It argues for rather liberal borrowing or diffusion of cultural traits from neighboring groups to account for material culture likenesses. The vehicle for interaction and influence is through exchange. The position of Potomac Creek people on the lower tidewater positioned them to naturally act as "cultural brokers" as well as traders of goods. Turner (1988, 1991) advances this possibility, citing as a parallel example the increased, late-period occurrence of Gaston-Cashie ceramics in the traditionally, Townsend-dominated region just below the James River falls. The mechanism in this case is, again, an emerging exchange system that fostered diffusion of ideas, including ceramic traits.

Origins aside, there are agreed upon archaeological and historical facts that characterize the Potomac Creek Complex. The complex has its origins in the prehistoric, Late Woodland period, probably beginning in the fourteenth century. A large segment of the population resided in fortified villages along the lower Potomac River. Smaller hamlets and procurement sites are also known along the river and its tributaries. The economy was based in large measure on local, native plant and animal resources but some level of horticultural practice is suspected. Non-village sites may be oriented to seasonal collection of food resources. Burial tended to occur as multiple, or corporate, interments. House patterns are poorly documented but appear to be oval or rectangular in plan. Historic contact with Europeans led to disruption of the traditional settlement pattern and the population eventually shifted southward to the Rappahannock basin.

CHAPTER 2:
Research Design and Methods

RESEARCH DESIGN

Despite the longstanding interest in the Potomac Creek Site, major questions remained unanswered at the outset of our recent investigation. This we can attribute in large measure to the timing of the intensive archaeology, namely before World War II. Methods we would apply today, and even the questions we would pose now, are considerably different. In this sense a general goal was simply to bring the archaeology of the site into the late twentieth century.

This general intent has two aspects. The more obvious is to bring advances in methods to bear in the analysis of this sample. These include radiocarbon dating, flotation recovery of subsistence remains, ethnobotanical analysis, and systematic faunal analysis. The other is to pursue a strictly archaeological analysis at the outset, rather than application of the so-called direct historical approach. The latter approach is dominant in assessments of the Potomac Creek Culture and is natural given the extraordinary ethnohistorical record from the seventeenth century. It may complicate our understanding of Potomac Creek's earlier phases, however, especially its origin, early tidewater development, and interactions with regional groups. Intrinsic to this plan are the following specific topics.

1. Date the Site: No absolute dates had been obtained prior to our work that reliably date the occupation span or specific phases or events that occurred within it.

2. Site Function: Did the site serve as a nucleated village with a high density population within the confines of the enclosures, or did it serve some special purpose? Or did the function vary through time?

   The fortified nature of this village indicates that it was the principal place of residence for the local weroance or leader. At the very least, it is distinguished from ordinary settlements by the fortifications. Potter (1993) suggests that the Potomac were agents of trade for the area and that sites like this one were also pivotal "centers" in the regulation of goods. As such, the site might well have contained one or more storehouses for keeping trade material. Other physical evidence suggests that the site might have served a "special" purpose more than it did a principal settlement for a significant segment of the local population. This evidence is the relatively small size of the enclosed area and the general lack of clear house patterns. (Admittedly, the latter may be a problem of recognition due to the profusion of posts in some areas.) Regardless, the precise function of the site is not established. Steps that could be initiated to resolve the issue are to recover a sample of artifacts from representative features sufficient to:

   a) determine whether subsistence remains are in any way unique by the relatively high proportion of choice cuts of meat and maize remains;

   b) look at ratios of artifact types that might signify special activities (e.g., local vs. nonlocal ceramics, sacred vs. secular items, and traces of probable exchange commodities like silver ore and shell beads); and *c)* carefully estimate the number of domestic structures that could fill the enclosed space and from that generate a population figure.

The concentric series of palisade lines, trenches, and a ditch clearly signify a rather dynamic evolutionary history. If we can assume that individual or perhaps pairs of these features define the limits of the village at a given time, changes in total village area did occur. The timing and sequence of changes in village size, whether increasing or shrinking, can potentially inform on larger events like political organization (chiefdom development), population fluctuations potentially linked to epidemics, and site function. To address this topic, we proposed careful excavation of representative sections of the boundary features to:

(1) establish their function,

(2) recover samples suitable for dating, and

(3) explore the sequence of intrusion and overlap to reconstruct the chain of events.

3. Economy: Faunal and floral remains are well preserved at the site but a thorough assessment of subsistence patterns has been lacking. This was the first time a screened sample was recovered and flotation of feature fill was conducted.

Subsistence patterns are always of general interest but specific issues can be addressed in this case. A key topic is to gauge the contribution of maize and other tropical cultigens to the late prehistoric/protohistoric diet. Over most of the Coastal Plain their remains are in short supply, in spite of frequent mention of maize in ethnohistorical records. Two questions can be examined:

a) To what degree did cultigens like maize contribute to the Potomac Creek diet?

b) If an immigrant population, is their subsistence pattern different from that of indigenous groups? To address these topics a sample should be excavated sufficient to:

(1) generate a quantity of fill for flotation to recover subsistence remains, especially from domesticated plants,

(2) permit meaningful ethnobotanical analysis of the remains,

(3) possibly permit analysis of phytolith remains, and

(4) permit meaningful zooarchaeological analysis.

4. Material Culture: Our sample is the first systematically recovered assemblage from the site, meaning that feature fill was passed through 6.4-mm hardware cloth, and portions of the fill were collected for flotation. These steps guarantee a representative collection of artifacts. This provides the opportunity to thoroughly examine ceramics from the Potomac Creek ware type site, along with lithic and bone technology.

By most accounts the Potomac Creek Culture is intrusive in the Tidewater region, probably representing migration from the upper reaches of the Potomac drainage in the fourteenth century. Social and trading ties appear to have been maintained with Piedmont groups to some degree even after this shift, as indicated by the occurrence of nonlocal ceramics like Keyser (Luray) ware. Here again, the degree and timing of these interactions can be established by recovering a sample of artifacts sufficient to document relative frequencies of ceramic wares and other artifacts diagnostic of group affinity.

DESCRIPTION OF FIELD METHODS

Fieldwork consisted of three steps. The first simply involved reopening the CRI excavation and cleaning the stripped surface as necessary to reveal features. The CRI grid and datum points were reestablished and referenced during this work. The stripped surface was in very good condition when it was uncovered and most features described by CRI were clearly evident. Areas were re-cleaned as necessary to insure that feature outlines and other details were distinct.

The second step in the process consisted of rather straightforward data recovery from features exposed in the earlier phase of study. Features were prioritized for excavation by determining which were likely cultural in origin and exhibited the highest information potential, especially with respect to the research design. The goal was to recover a representative sample of cultural feature contents.

At least 50% of all cultural features was excavated to recover a systematic, screened sample. Smaller, controlled samples were recovered from enclosure features such as palisade postholes and palisade trenches. The standard excavation section in the narrow trenches was 2 m in length. Excavation of the ditch feature (Feature 1) was controlled by removing the fill in sections which tended to be 2 m wide and oriented with the project grid.

Excavated feature fill was screened through 6.4 mm mesh, with the exception of the portions collected for flotation and other special analyses. Excavated features were cross-sectioned to expose profiles which were recorded by scale drawings and photographs. Special samples for radiocarbon dating, paleobotanical, and other analyses were collected as warranted.

The final step was to update the CRI excavation plan based on the most recent results. The entire exposure was mapped using a plane table and alidade and a revised plan was generated. Results were very consistent with the CRI plan, with significant additions only in the westernmost and southeastern sections.

It should be noted that staff from the historic preservation program at Mary Washington College have conducted limited follow-up to this work. They removed the last small section of ditch fill and hand-excavated two units just south of the exposed area to better define Feature 23. They have also initiated a testing program west of the project area to assess the archaeological potential there.

LABORATORY ANALYSIS

The WMCAR has developed a hierarchical coding system that operates using Paradox relational database software. Under this system, artifacts are coded during analysis on standard data sheets for entry into a data file. Using this file, overall project inventories as well as particularistic data reports can be readily generated for inclusion in reports or for routine analysis. Basic categories identified are described below.

LITHIC ARTIFACTS

Debitage

Debitage is the byproduct of stone tool manufacture. To make a stone tool, the tool maker strikes the selected stone with another stone or other object, such as a deer antler. The impact causes pieces, or “flakes,” of the impacted stone to break away, which can eventually allow the impacted stone to be shaped into a tool such as a spear point, knife, or scraper. Alternatively, another common stone tool manufacture strategy involves striking large flakes from the impacted stone that are used as blanks for further reduction into tools such as hafted bifaces. Thus, depending on the specific stone tool reduction strategy and raw material, the flakes of stone may be waste, they may be utilized as expedient tools, or they may be further reduced into formal tools. Stone tool manufacture requires several different stages of reducing the raw material to a finished product, and the resulting debris is often distinguishable from one stage to another. Identifying and analyzing these subcategories of flakes, as well as the different stone tools themselves is important for understanding how prehistoric hunter-gatherers made and used their tools.

Analysis of flakes involves observation of certain morphological characteristics. Each flake has two sides. The dorsal side, usually convex, is part of the outer surface of the stone from which the flake was struck. The ventral or interior side, usually concave, is the surface that was detached from the original stone. The platform is essentially the point of impact, recognized by a “shelf” at one end of the flake. The bulb of percussion, also known as bulb of force, is a swelling on the flake created by the initial passage of force through the stone from the blow necessary for flake removal. Lipping is a ledge that sometimes occurs near the platform and at the top of the bulb of percussion.

Primary/Reduction Flakes are formed during the first stage of stone tool manufacture, which entails the relatively quick removal of the unwanted outer part of the stone. Such flakes are placed in this category largely by default; in other words, they are identifiable as flakes but do not qualify as secondary/thinning, tertiary/retouch, or bipolar flakes. General identifying characteristics, however, are relatively obtuse platforms without lipping, a pronounced bulb of percussion, and a relatively thick cross-section. Flakes in this category are interpreted primarily as the byproducts of early-stage reduction, owing largely to their tendency to exhibit simple platforms and pronounced features such as ripples and bulbs of percussion.

Secondary/Thinning Flakes are indicative of more controlled flake removals, intended to refine the tool’s shape. These flakes are often associated with the production of bifaces—that is, stone artifacts that have been flaked along both faces/sides of an edge. Secondary flakes are identified most readily by their acute, lipped, and generally multifaceted platforms. Such platforms are segments of biface margins removed on impact. Biface thinning flakes are also relatively thin and flat or slightly curved in cross-section. The bulb of percussion is diffuse. Two forms of this flake type commonly occur. One is the better-known, lipped flake with a multifaceted platform. The other resembles a fish scale in plan view; while often lipped, lipping is very slight, and the platforms typically are narrow and curvate or recurvate. These flakes are generally considered to result from thinning and resharpening relatively refined, mid- to late-stage bifaces.

Tertiary/Retouch Flakes are recognized as the byproduct of tool retouch or resharpening. They exhibit small, point platforms that are usually lipped, an outline that expands from the platform toward the termination, a thin cross-section, and small size (generally not more than 5 mm in the longest dimension).

Bipolar Flakes are distinctive, but care must be taken to avoid classifying them as shatter or angular fragments, particularly if they are of quartz. They are the byproduct of a tool-making technique that involves striking the stone at one end while the other end is supported by another stone. Bipolar flakes have virtually no bulb of percussion and often are long and narrow or wedge-shaped. Another distinctive feature is distinct radial lines below the points of force, and many times they exhibit crushing at opposing ends.

Flake Fragments/Shatter are non-diagnostic medial and distal fragments of broken flakes. Virtually any portion of a flake minus a platform should go into this category.

Angular/Blocky Fragments, as the name implies, are angular/blocky chunks of stone that are probably the byproduct of stoneworking but that cannot be identified as flakes or portions of flakes. These fragments are not to be confused with fire-cracked rock. They often occur when blocks or nuclei of poor-quality or internally flawed material are struck.

Blade-like Flakes are at least twice as long as they are wide and have long, parallel ridges or arrises on their dorsal surfaces, perpendicular to the platform. Assigning debitage to this category should be done conservatively, with the intention of identifying purposefully struck, linear flakes. Some evidence of platform preparation/ grinding is a valuable indicator of these flakes.

Prismatic Blades are highly standardized blade flakes with prepared platforms, prismatic cross-sections, and a high degree of uniformity in form.

Tested Cobbles/Nodules are pieces of raw material that are unmodified beyond the removal of only one or a very few flakes. Presumably, they represent pieces that were tested for quality and discarded.

Tools

Utilized Flakes are flakes or flake fragments (shatter) that were utilized "as is" for cutting, scraping, etc. As such, they exhibit no intentional modification for hafting or sharpening. Instead, there is incidental damage to the edges resulting from use, which appears as very fine flake scars. These scars are invasive not more than 2 mm from the tool margin. Damage from screening, trampling, etc. can mimic such use damage. To be conservative, all artifacts placed in this category must have regularized rather than intermittent or spotty damage to the edge.

Utilized flakes are subdivided according to the form of the utilized edge. Potential forms are straight, concave, convex, or denticulate. In some instances, more than one of the utilized edge forms may be present.

Retouched Flakes differ from utilized flakes only in that they were intentionally modified prior to use. Flake scars on their edges are regularized but are invasive at *least* 2 mm from the tool margin. The same subcategories of edge form apply as well.

Other Bifaces are generally regarded as preforms or generalized bifacial tools (i.e., knives). They lack modification for hafting. Following Callahan (1979), bifaces can be classified according to stage in the reduction process. Only the first four stages of his five-part scheme are recognized in the analysis.

Hafted Bifaces are formal tools more commonly known as projectile points/knives. They are bifacial and are modified for hafting. Diagnostic or potentially diagnostic specimens (complete or proximal fragments whose characteristics can be associated with a particular culture or time period) are coded separately from non-diagnostic pieces such as tips, ears, etc.

Other Formal Tools are formed tools other than hafted bifaces or other bifaces. Items in this category include drills and endscrapers. In most cases, they exhibit modification for hafting.

Cores are the parent pieces from which potentially usable flakes are struck. Consequently, they are best recognized by the flake scars left by flake removals. Cores are classified here by the nature of the flake scar patterns evident on their surfaces. Random cores exhibit random flake removals. Lamellar cores are marked by regular, linear flake removals leaving parallel or subparallel flake scars. Bipolar cores are usually rather small and exhibit battering at opposing ends. One of the opposing edges is often a narrow, bifacial “crest,” while the other is truncated and battered in appearance. Bifacial cores resemble thick, irregular bifaces (see Stage 2 of Callahan 1979). Tabular cores are those derived from plate-like cobbles or nodules. Flake removals are directed from the margins of the piece, which readily serve as platforms.

Other Lithic Artifacts

Formal Ground Stone items are modified by pecking and/or grinding rather than by flaking. The degree of modification is extensive—to the point that the original form of the stone from which the artifact was fashioned is obliterated. Typical artifacts include axes, celts, gorgets, and steatite bowl fragments.

Informal Ground Stone includes artifacts that have been modified by pecking and/or grinding but have not been formally shaped; they retain in large part the form of the unmodified stone from which they were made, such as a cobble or slab. These artifacts include hammerstones, simple grinding slabs and manos, and artifacts that are only *possibly* modified by grinding/ pecking.

Fire-Cracked Rock is recognized as rough, blocky pieces of stone that has irregular fracture surfaces. In some cases, the stones may also be reddened from exposure to intense heat. This material is counted and weighed.

Other/Unmodified Stone represents miscellaneous rock recovered incidental to collection. It bears no evidence of modification. Such material can also be referred to as “manuports.” Other stone is counted and weighed.

CERAMIC ARTIFACTS

Prehistoric ceramics were initially classified primarily by description along two dimensions: temper and surface treatment. Whether the artifact was a vessel or other artifact fragment was also noted, and in the case of vessel fragments the specific portion was identified. At the initial level of analysis, ceramic sherds were not “typed” in the traditional sense but grouped according to temper/surface treatment. Following this initial classification, the correlation of the ceramics with diagnostic types of the region was examined. Key references consulted during the analysis were Egloff and Potter’s (1982) overview of Coastal Plain ceramics, Stephenson et al.’s (1963) descriptions for Moyaone, Stewart (1992) and Jirikowic’s summary for 44ST2, Potter’s (1993) descriptions of Potomac area types, and the discussion of Montgomery complex types in Slattery and Woodward (1992).

The volume and character of the ceramic sherd sample required adjustments in standard procedures to meet time and budget constraints. A great many of the sherds were observed to be relatively small and were prohibitive to accurate description. The decision was made to size sort the sample after a test of the procedure and its effects. All sherds >2.5 cm were subjected to standard descriptive analysis. Sherds <2.5 cm were only counted.

OTHER MATERIAL

Radiocarbon samples were collected frequently where suitable material and contexts occurred. The carbonized wood was carefully removed, wrapped in foil, and sealed in plastic bags. Eight samples were chosen for assay, and all were submitted to Beta Analytic, Inc. in Miami.

All bone was washed and counted by context. All recognizable tools were removed and described. Approximately 50% of the bone from selected contexts was submitted to Gwenyth Duncan for systematic analysis. Details concerning methodology are provided with her report in Appendix C.

Standardized soil samples were taken from all excavation contexts for flotation. The standard sample volume was three liters and multiple samples were taken as appropriate, but with at least one sample per context. Flotation was conducted using a Flote-Tech system using only water and agitation.

Ethnobotanical samples were taken primarily from flotation fractions, although some floral remains were picked from screens in the field. A representative sample of flotation fractions was submitted to Justine McKnight for ethnobotanical analysis. The sample consisted of material from 20 contexts representing 16 features. Details concerning her methodology are provided with her report in Appendix B.

Five samples from five features were submitted to Dr. Lisa Kealhoffer at the Colonial Williamsburg Foundation for phytolith analysis. The emphasis of this work was to further gauge the occurrence of tropical cultigens, especially maize. The samples were unprocessed soil from which phytolithic remains were extracted using a standard, controlled procedure. Details concerning methods and results are provided in Appendix D.

ARTIFACT CURATION

All material generated by this project have been curated according to standards outlined in 36 CFR Part 79 "Curation of Federally-Owned and Administered Archaeological Collections." All artifacts were washed and placed in resealable polyurethane bags with labels. These were in turn logically ordered in acid-free Hollinger boxes for permanent storage. These materials are temporarily stored at WMCAR until final disposition is arranged with DHR.

CHAPTER 3:
Results of Excavation

OVERVIEW OF THE EXPOSED AREA

The 34 × 18.5 m exposure constituting the project area corresponds to the northwestern perimeter of the enclosed site (Figure 6) (see Figure 4). A portion of the area had been previously excavated by Graham and Stewart between 1935 and 1940 (approximately 11% of the project area), during which time most of the features examined during the present project were revealed and recorded for the first time. Some of these were also partially excavated, as noted in the discussion to follow. What the current investigation has contributed is more complete exposure of the features in this area combined with thorough, systematic sampling of the contents.

The quality of Stewart's (1992) site plan allows us to overlay our results and marry them to those from 60 years ago. The area reported on here is equivalent to about 50% of the maximum site radius and, specifically, the outermost section (see Figure 4). As such, it contains segments of all but the innermost palisade feature and offers the opportunity to closely examine the sequence and methods of enclosure construction. This position does not permit new investigation of the innermost section of the enclosed area and may account in part for the rarity of pit features and building patterns. As addressed below, this may also restrict our ability to interpret certain phases of the occupation.

A general note about overall stratigraphy is in order here. The site deposits are rather shallow but are typical for the area. The A-horizon consists almost entirely of a former plowzone and overlies a sandy clay subsoil with an abundance of pebbles. The plowzone averages about 25–30 cm thick above the top of subsoil. This plowed deposit was sampled during the initial stage of this investigation by CRI before they stripped it away to expose features intrusive into subsoil (Outlaw and Tyrer 1996).

The WMCAR created distribution plots of various artifact groups recovered in the CRI plowzone sample. Their systematic results offer general insights, but details relating to internal spatial organization are as yet elusive. Each of the plots exhibits a notable decrease in artifact density at the outermost palisade enclosure (Figures 7–10). Inside the village perimeter, there is a consistent decline in density in a north-south band at about the 90E gridline. This may be an effect of sampling from earlier excavation at the site in the 1930s. Otherwise, there are no clear patterns that associate strongly with specific features or obvious activity areas. At the very least, however, the association with the village margin supports contentions that plow movement is usually negligible.

RADIOCARBON DATING RESULTS

Establishing the date of occupation for this site was a key goal of the project. Eight radiocarbon samples were submitted to Beta Analytic, Inc., for assay (Table 4). Four of the dates required accelerator mass spectrometry (AMS) dating due to the small sample size. Three others required extended counting under conventional procedures, and one is a conventionally processed sample. AMS and extended counting was expected in most cases since individual pieces of carbon were selected to obtain precise results. Samples were intentionally chosen to evaluate the sequence of site expansion or contraction, and to date discrete assemblages from pit features.

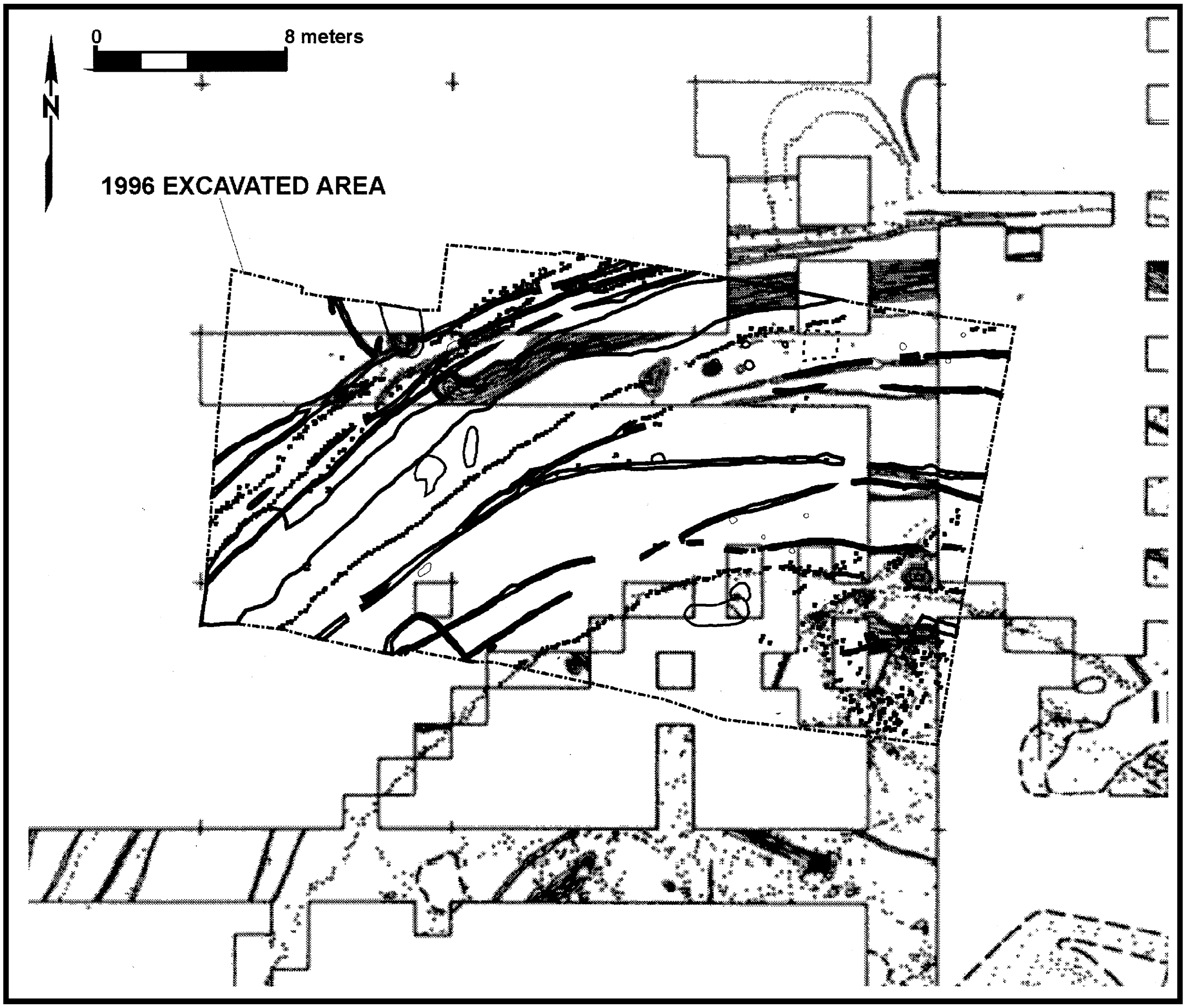


Figure 6. Site 44ST2, correlation of 1996 excavation area with Stewart's site plan.

All but one of the dates conform comfortably to the expected range for a Potomac Creek occupation (Potter 1993). The range of occupation as measured from intercepts with the tree ring calibration curve is AD 1285–1630. The mean date of the intercepts is AD 1458. Expanding the range based on a calibrated 2-sigma (95% probability) span is AD 1260–1655. The mean, median date of these ranges is AD 1426.

The calibrated date of AD 1025 for Feature 25 is earlier than expected. Whether it represents an old wood problem or contamination is uncertain. The artifacts in the feature indicate that the deposit is Potomac Creek in age and should not pre-date AD 1300.

These results indicate that the Potomac Creek Site was settled early in the Potomac Creek phase and is, perhaps, one of the first sites established by this population. The overall archaeological results also make clear that the occupation probably did not extend into the historic period, and that the site may have been largely abandoned for residential use as much as a century before AD 1607.

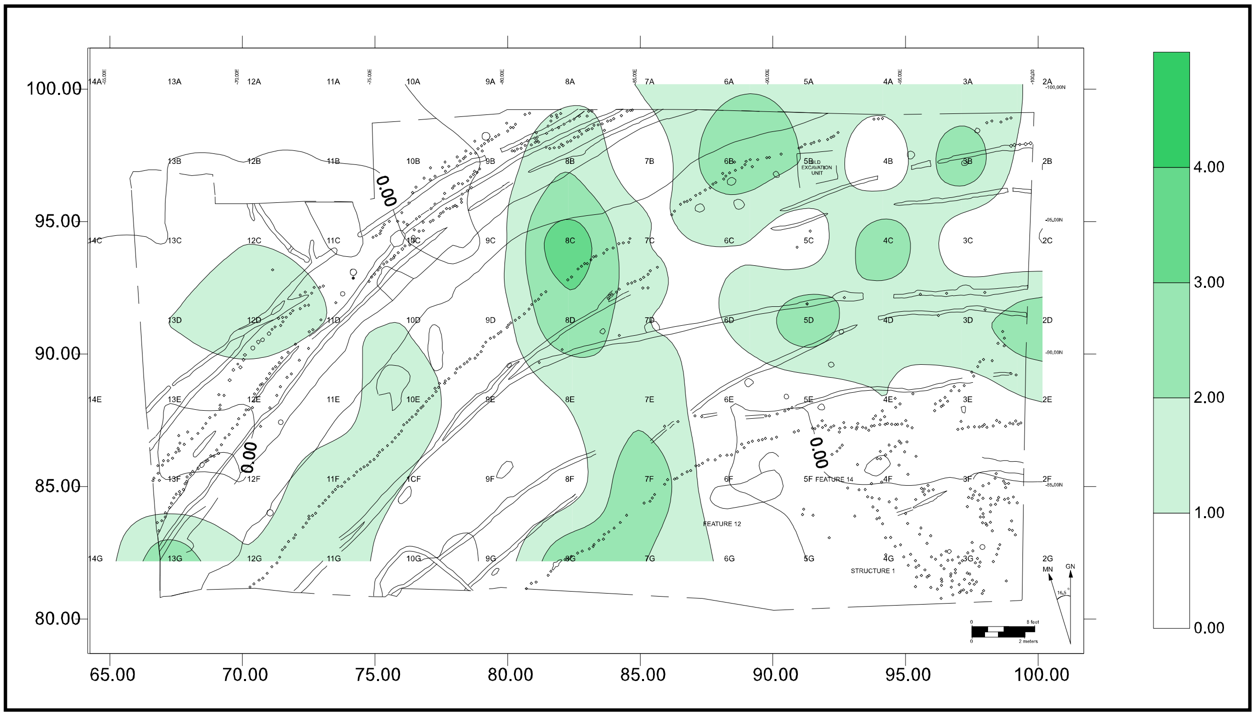


Figure 7. Site 44ST2, distribution of fire-cracked rock from 1996 CRI shovel tests.

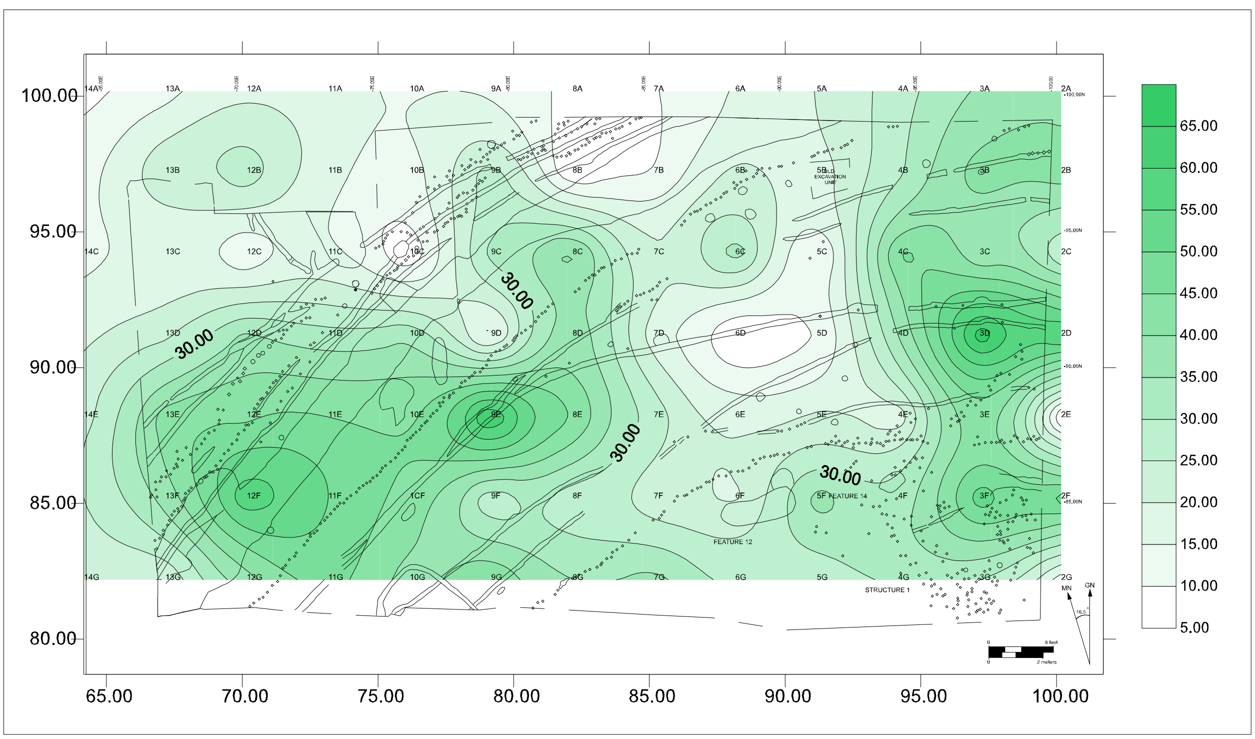


Figure 8. Site 44ST2, distribution of debitage from 1996 CRI shovel tests.

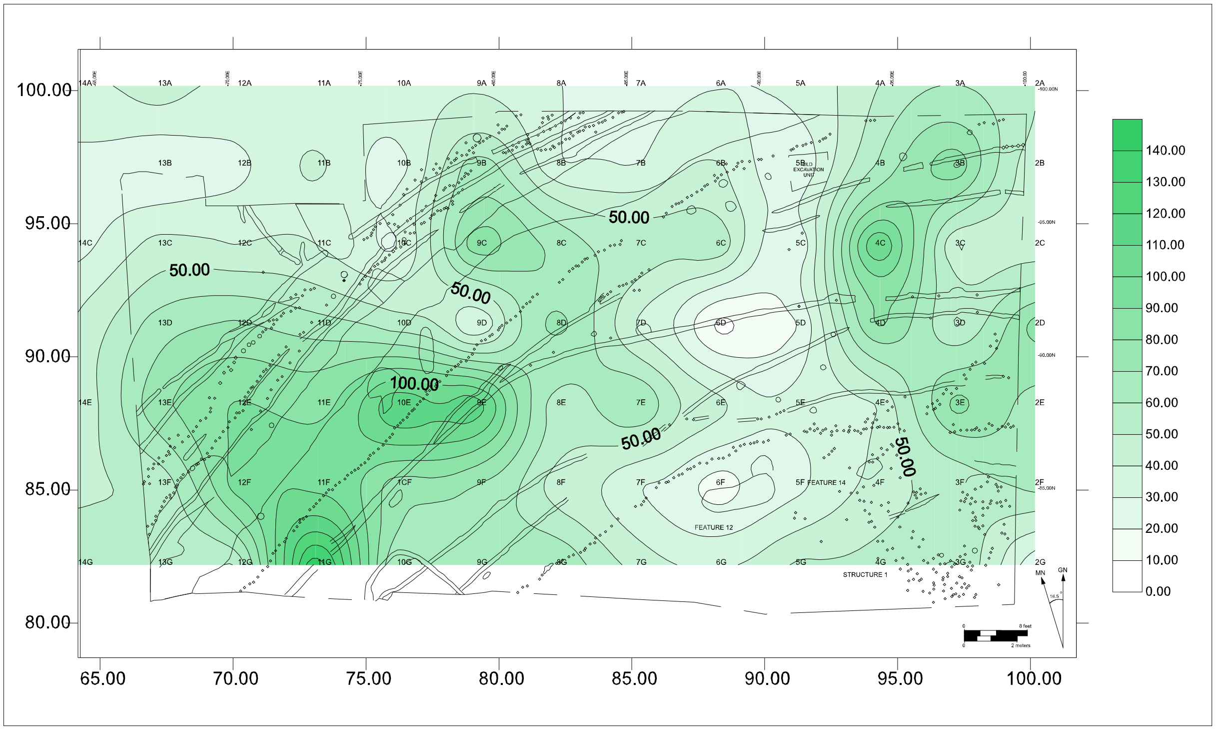


Figure 9. Site 44ST2, distribution of ceramics from 1996 CRI shovel tests.

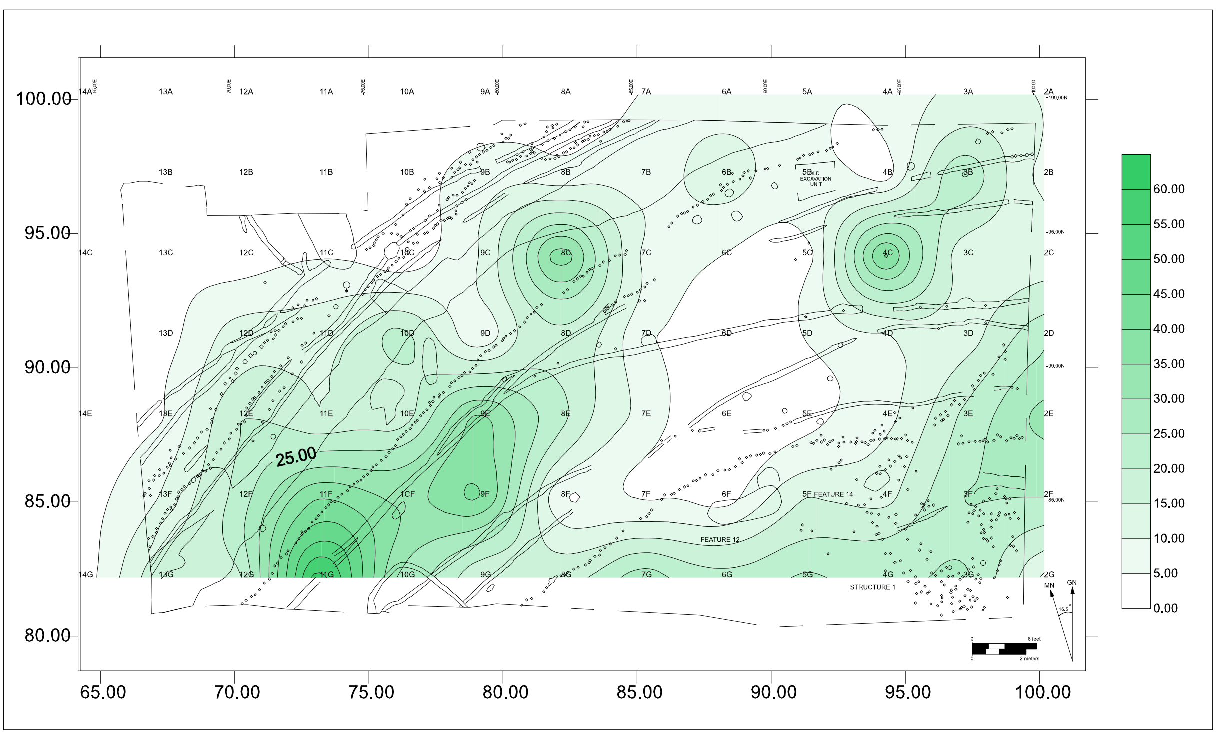


Figure 10. Site 44ST2, distribution of bone from 1996 CRI shovel tests.

Beta Sample No.	Feature No./ Description	Measured C14 Age (BP)	Conventional C14 Age (BP)	Intercept(s) w/ Calibration Curve	Calibrated Age (2 sigma)
104594	25 - small basin	990 ± 70 (ext*)	990 ± 70	AD 1025	AD 950–1215
104593	23 - structural trench	740 ± 30 (AMS**)	730 ± 30	AD 1285	AD 1260–1300
102325	17 - large basin	670 ± 60 (ext)	670 ± 60	AD 1300	AD 1260–1410
102322	1 (Sct. E) - ditch	640 ± 50	640 ± 50	AD 1310, 1365, 1375	AD 1280–1415
102323	4 - palisade trench	540 ± 60 (AMS**)	540 ± 60	AD 1415	AD 1300–1455
102324	12 - large basin	410 ± 50 (ext)	410 ± 50	AD 1460	AD 1425–1640
102595	6/7 - palisade trench	370 ± 30 (AMS**)	350 ± 30	AD 1515, 1585, 1625	AD 1460–1645
104592	10 - palisade trench	340 ± 40 (AMS**)	340 ± 40	AD 1520, 1570, 1630	AD 1455–1655

* ext: extended counting for a conventional date
** AMS: accelerator mass spectrometry

Table 4. Site 44ST2, summary of radiocarbon assay results.

FEATURE DESCRIPTIONS

Twenty-four cultural features, or parts of features, were exposed in the project area (Figure 11). They are summarized in Table 5. Eleven (46%) of these represent enclosure features, or palisade lines. Some that are assigned separate numbers merge with others also designated separately, so that they actually represent part of the same enclosure system. The palisade features are of two kinds to be described below: narrow trenches or driven posts. Two palisade posts were also assigned separate feature numbers. Another feature that also served as part of the enclosure system is a ditch, which also exhibits two "extensions." Only five (21%) features represent "pit features," and in each case are really shallow, refuse-filled basins. Three features are structural in nature. Two may be trenches defining bastions along palisade lines, and the other is a building pattern. Three non-cultural anomalies were also assigned numbers.

PALISADE TRENCHES AND POST LINES

Features 3, 4, 5, 6, and 7 are all palisade trenches located inside the large Feature 1 ditch; Features 9, 10, and 11 are palisade trenches located outside the Feature 1 ditch (Figure 12) (see Figure 11). Feature 2 is a palisade post line, the innermost palisade wall identified within the project boundaries. Feature 8 is also a palisade post line, located inside the Feature 1 ditch. These palisade features are described from the innermost line (Feature 2) to the outermost line (Feature 11).

Feature 2

Feature 2 is represented by the innermost line of postmolds identified. These postmolds are 0.10–0.15 m in diameter, with variable spacing of about 0.20 m. A 2-m section of posts in this feature was excavated, and they are similar in profile to post Features 18 and 19 in the Feature 3 palisade trench, described below. About 20.41 m of this palisade was exposed by this project.

Fea. No.	Type	Length (m)	Width* (m)	Depth* (m)	Portion Excavated**	Total Artifacts	Comments
Palisade Trenches and Post Lines							
2	Palisade post line	20.41	0.10	–	2.0	–	Width is post diameter
3	Palisade trench	25.79	0.14	0.15	7.46	273	Excavated in 2 sections
4	Palisade trench	24.21	0.18	0.12	10.17	305	Excavated in 3 sections
5/6a	Palisade trench	31.03	0.24	0.16	14.54	960	Excavated in 4 sections; includes 2.58 m of Fea. 6a and 1.15 m of Fea. 6
6	Palisade trench	21.38	0.15	0.14	9.54	176	Excavated in 3 sections; includes 1.54 m of Fea. 7
7	Palisade trench	17.1	0.15	0.22	8.00	235	Excavated in 2 sections
8	Palisade post line	29.93	0.13	–	9 posts	–	Width is post diameter; all soil saved as sample
9	Palisade trench	24.14	0.17	0.08	7.73	73	Excavated in 2 sections
10	Palisade trench	23.45	0.19	0.16	9.00	225	Excavated in 2 sections
11	Palisade trench	20.41	0.20	0.15	6.62	50	Excavated in 2 sections
27	Palisade trench	7.45	0.14	–	None	–	Not shown on CRI plan
Postmolds							
18	Palisade post	0.10	0.10 m	0.13 m	All	0	
19	Palisade post	0.10	0.10 m	0.18 m	All	7	
Main Ditch and Ditch Extensions							
1	Ditch	28.97 m	0.93 m	0.24 m	25.94 m	14891	Excavated in 13 sections
15	Ditch extension	>2.37 m	0.84 m	0.22 m	All exposed	1492	
24	Ditch extension	1.00 m	0.88 m	0.09 m	All	63	N ½ trowel sorted
Basin Features							
12	Large basin	2.70 m	0.84 m	0.18 m	All	1755	E ½ trowel sorted
17	Large basin	>2.60 m	1.50 m	0.28 m	All exposed	748	N ½ trowel sorted; unexposed not excavated
25	Medium basin	1.40 m	0.90 m	0.12 m	All	385	N ½ trowel sorted
26	Small basin	0.76 m	0.62 m	0.04 m	All	46	
14	Small basin	0.70 m	0.65 m	0.05 m	W ½	28	
Structural Features							
23	Structural trench	>4.61 m	0.18 m	0.12 m	All exposed	85	Unexposed not excavated
21	Structural trench	2.69 m	0.15 m	0.11 m	All	38	
Miscellaneous Features							
22	Non-cultural	1.68 m	0.48 m	0.06 m	S ½	31	
20	Tree root	2.62 m	0.12 m	0.05 m	All	2	
13	Non-cultural						Unexcavated
16	Tree	1.19 m	0.73 m	–	S ½	1	

*For trenches of variable width and depth, measurements are listed as the median of the range.
**Portion of feature measured in linear meters.

Table 5. Site 44ST2, summary of feature descriptions.

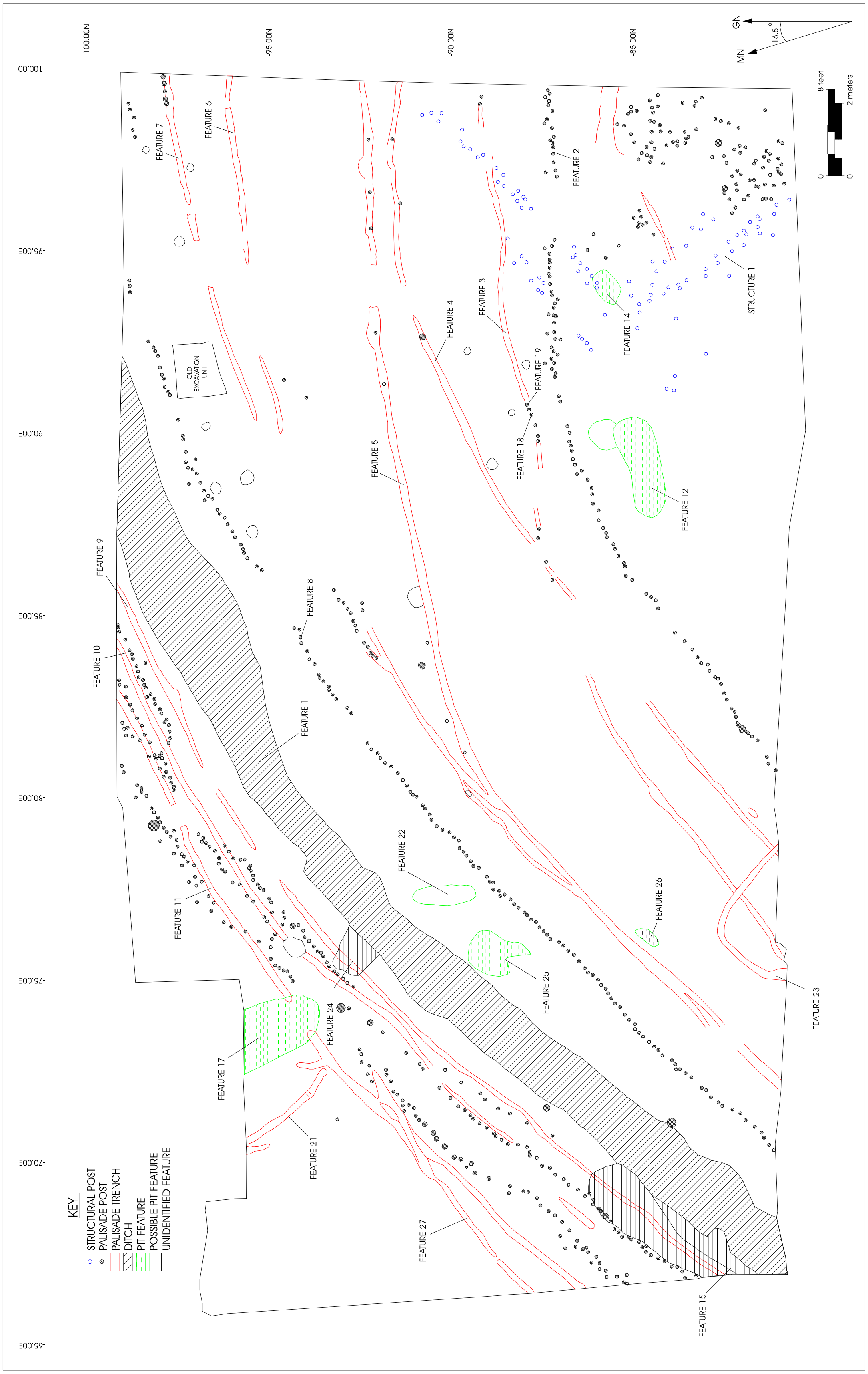


Figure 11. Site 44ST2, plan of excavation area.

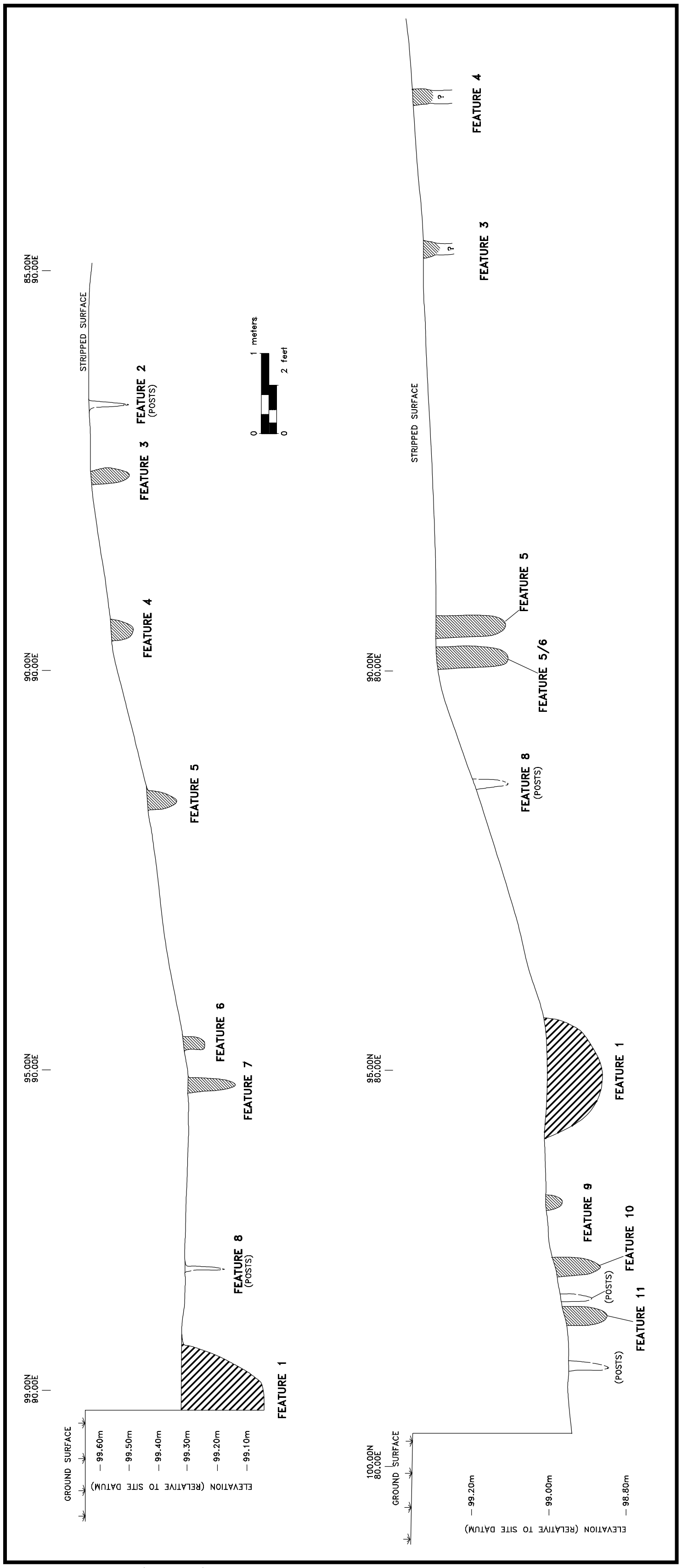


Figure 12. Site 44ST2, cross-section through excavation area.

Features 3, 4, 18, and 19

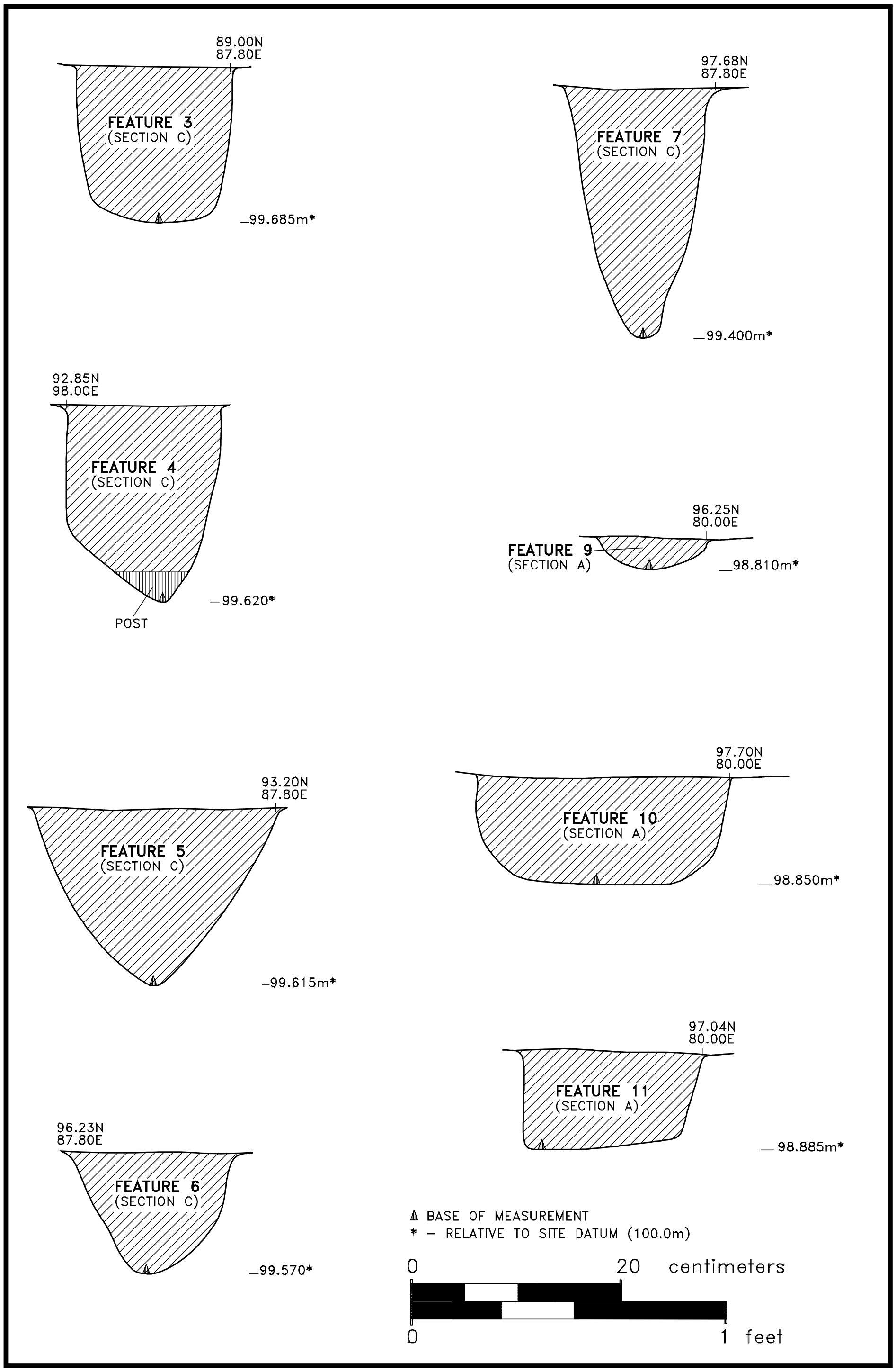
Features 3 and 4 are the innermost of the palisade trenches exposed by the project area; Features 18 and 19 are two of several postmolds identified at the base of Feature 3. These two palisade trenches cross between the 86E and 87E gridlines; east of this crossing, Feature 3 is the innermost trench, and Feature 4 is the innermost trench west of this crossing.

Two contiguous sections of Feature 3 were excavated, one between the 90E and 94E gridlines (Section B), and one from the 94E gridline east to a modern disturbance at about 97.6E (Section C). Most of Section C would have been exposed by Stewart's excavations. The width of the trench ranged from 0.12 to 0.15 m wide and about 0.15 m deep below the stripped surface (Figure 13). The base of the trench is flat to wedge-shaped. Posts were identified at the base of the feature in some places, especially near the western end of Section B where the trench became shallow (perhaps due to uneven stripping). Two of these posts in Section B (Features 18 and 19) were excavated. These circular, contracting postmolds extend 0.13 to 0.18 m below the *base* of the palisade trench, and are 0.10 m in diameter. The southwestern end of the exposed trench is cut by Feature 23, which appears to represent wall trenches associated with a structure. The Feature 23 structure appears to post-date the Feature 3 palisade trench, since there was no evidence of Feature 3 fill in the larger Feature 23 trench.

Both sections of Feature 3 were completely screened through 6.4 mm hardware cloth, and an east-facing profile was recorded. Trench soils consisted of a dark brown (10YR3/3) loamy sand. A total of 273 artifacts was recovered from Sections B and C, including 82 ceramic sherds, one pipe fragment, 148 bone fragments, 15 pieces of shell, 33 pieces of debitage, one piece of fire-cracked rock, one small triangular hafted biface, one informal tool, and one piece of unmodified limestone. Most of these artifacts were recovered from Section C (67%, n=183). No artifacts were recovered from the Feature 18 post; two small ceramic sherds, four bone fragments, and a piece of unmodified bog iron were recovered from the Feature 19 postmold. Soils in both molds were the same as the palisade trench.

Feature 4 was excavated in three contiguous sections between the 88E and 98E gridlines. Section A was about 2 m long, Section C was about 4 m long, while Section B was slightly longer at 4.17 m. These sections are located about 0.38 to 1.92 m north of Feature 3. The width of the trench ranged from 0.15 to 0.20 m wide and about 0.08 to 0.15 m deep below the stripped surface. The base of the trench is basin-shaped, and posts were identified at the base of the feature in some places. As with Feature 3, the southwestern end of the exposed trench is cut by Feature 23, and Feature 23 appears to post-date the Feature 4 palisade trench, since there was no evidence of Feature 4 fill in the larger Feature 23 trench.

All three sections of Feature 4 were completely screened through 6.4 mm hardware cloth, with a east-facing profile recorded for Sections A, B, and C, and a west-facing profile for Section A. Soils in all sections consisted of a dark brown (10YR3/3) loamy sand. A total of 305 artifacts were recovered from the three sections of Feature 4; as with Feature 3, most artifacts were recovered from Section C between 94E and 98E (78%, n=234). The total artifact assemblage includes 94 ceramic sherds, one pipe fragment, 126 bone fragments, seven pieces of shell, 64 pieces of debitage, eight pieces of fire-cracked rock, one unfinished biface, one unidentified hafted biface, two quartz cores, and one piece of unidentified ceramic. This feature was radiocarbon dated to AD 1300–1455 (2-sigma calibrated range) (see Table 4).



KEY

Features 3–11 - Dark Brown (10YR3/3) Loamy Sand

Figure 13. Site 44ST2, cross-section of palisade trench features.

Features 5, 6, and 7

These three palisade trenches are well separated in the eastern portion of the project area, but merge into a single trench toward the west. At the extreme eastern end, Features 6 and 7 are separated by about 1.57 m, with Feature 7 merging into Feature 6 at about the 84E gridline. Feature 6 then continues westward, merging with Feature 5 at the 80E gridline. Feature 5 continues westward to the southwestern edge of the project area, with two split/rejoin sections (one of which was designated Feature 6A) that may represent repairs to the palisade. At the eastern end of the project area, Feature 5 is separated from Feature 6 by 7.86 m before eventually merging with Feature 6 at around the 80E gridline.

In addition to the excavation of two 3 to 4 m sections (Sections B and C) in each of these three palisade trenches, segments were excavated where Feature 7 joins Feature 6 (Section F), where Feature 6A meets Feature 6 and Feature 6 merges with Feature 5 (Section D), and where the Feature 6A repair rejoins Feature 5 (Section E). Sections B and C in Features 6 and 7 would have been exposed by Stewart's excavations, as would Section C of Feature 5.

The width of Feature 5 ranged from 0.20 to 0.27 m wide and 0.10 to 0.22 m deep below the stripped surface. The base of the trench is usually basin-shaped but is occasionally more flat. Posts were identified at the base of the feature in some places; one post evident in the west profile of Section E extended 0.10 cm below the base of the trench. All sections of Feature 5 were completely screened through 6.4 mm hardware cloth. Soils consisted of a dark brown (10YR3/3) loamy sand in Sections B, C, and E. In Section D, Feature 5 consisted of very dark grayish brown (10YR3/2) loamy sand, the same as the Feature 6A repair segment. The total artifact assemblage from Feature 5 (including 21 artifacts recovered during the final cleanup of the feature) consists of 960 artifacts. Section E of Feature 5 (which includes a portion of Feature 6A) was about 2 m in length, and accounted for 349 (36%) of these artifacts. The Section E artifact subassemblage includes nine ceramic sherds, one pipe fragment, 198 bone fragments, 61 pieces of shell, 55 pieces of debitage, 13 pieces of fire-cracked rock, one small triangular hafted biface, one quartz core fragment, one unidentified hafted biface fragment, one endscraper, one piece of unmodified slate, and seven pieces of unidentified ceramic. Section D of Feature 5, about 2.25 m in length, includes portions of Features 6 and 6A and contained 280 artifacts (29% of the Feature 5 assemblage). This subassemblage includes 71 ceramic sherds, 154 bone fragments, two pieces of shell, one shell bead, 41 pieces of debitage, six pieces of fire-cracked rock, one unfinished biface, one pitted, informal ground stone, and three pieces of unmodified bog iron. Section B of Feature 5 was about 3.19 m in length and contained 143 artifacts (15%). This subassemblage includes 44 ceramic sherds, 53 bone fragments, ten pieces of shell, 29 pieces of debitage, four pieces of fire-cracked rock, one quartz core fragment, and one piece of unmodified limestone. Section C of Feature 5, also about 3.19 m in length, contained 167 artifacts (17%), including 97 ceramic sherds, two unfinished bifaces, 28 bone fragments, 33 pieces of debitage, one piece of fire-cracked rock, one quartz endscraper, and five pieces of shell.

Feature 6 was 0.15 m in width at all profiles, extending 0.07 to 0.21 m deep below the stripped surface (the shallower measurements coming at the northeastern end). The base of the trench is generally basin-shaped, and posts were identified at the base of the feature in some places. All excavated sections of Feature 6 were completely screened through 6.4 mm hardware cloth. As with Feature 5, Feature 6 soils consisted of a dark brown (10YR3/3) loamy sand in Sections B and C. In Section D, Feature 6 was comprised of very dark grayish brown (10YR3/2) loamy sand, the same as the Feature 6A repair segment and Feature 5 in Section D. The total assemblage from this palisade trench, including 22 artifacts recovered during cleanup procedures, consists of only 176 artifacts. Section F of Feature 6 (which includes a short section of Feature

7 where it joins Feature 6) was about 2 m in length, and accounted for 72 (41%) of these artifacts. The artifact subassemblage includes 26 ceramic sherds, 25 bone fragments, 11 pieces of shell, seven pieces of debitage, two pieces of fire-cracked rock, and one shell bead. Section B of Feature 6, about 2.88 m in length, contained only 26 artifacts (15%). This subassemblage includes 15 ceramic sherds, six bone fragments, two pieces of shell, and three pieces of debitage. Section C of Feature 6 was about 3.08 m in length and contained 56 artifacts (32%). This subassemblage includes 29 ceramic sherds, eight bone fragments, 15 pieces of debitage, three pieces of fire-cracked rock, and one piece of unmodified bog iron.

Feature 7 was 0.13 to 0.16 m in width and, on average, deeper than Features 5 and 6 at 0.17 to 0.27 m below the stripped surface. The base of the trench is generally more wedge-shaped than other trenches, and posts were identified at the base of the feature in some places. All excavated sections of Feature 7 were completely screened through 6.4 mm hardware cloth, and all soils in the two contiguous excavated sections consisted of a dark brown (10YR3/3) loamy sand. The total assemblage from the 8 m excavated in this palisade trench (including six artifacts recovered during cleanup procedures) consists of 235 artifacts (76% from Section B). These artifacts include 132 ceramic sherds, one pipe fragment, 36 bone fragments, one small triangular hafted biface, one unfinished quartz biface, 53 pieces of debitage, seven pieces of fire-cracked rock, three pieces of shell, and one piece of unmodified, unidentified lithic material. Feature 6/7 was radiocarbon dated to AD 1460–1645 (2-sigma calibrated range) (see Table 4).

Feature 8

Feature 8 is a line of palisade postmolds like Feature 2. As with Feature 2, these postmolds are 0.10 to 0.15 m in diameter, with variable spacing of about 0.20 m. Nine consecutive posts in this line were excavated east of the 75E gridline. All of the soil from these posts was retained as a soil sample; these results are pending. About 29.93 m of this palisade were exposed by this project.

Feature 9

Feature 9 is a palisade trench located very close to the outer edge of the Feature 1 ditch (from 0.40 to 1 m north and west of the ditch). Features 15 and 24 both post-date Feature 9, which appears in the bottom of these features but not in the fill. Two contiguous sections of Feature 9 were excavated, between the 76E and 84E gridlines (Sections A and B). Very little of these sections would have been exposed by Stewart's excavations. The width of the trench ranged from 0.14 to 0.20 m wide and only about 0.08 m deep below the stripped surface. The base of the trench is basin-shaped to flat, and posts were identified in at the base of the feature in some places. About 24.14 m of this palisade were exposed by this project.

Both sections of Feature 9 were completely screened through 6.4 mm hardware cloth. Trench soils consisted of a dark brown (10YR3/3) loamy sand. A total of 73 artifacts was recovered from Sections A and B, including 23 ceramic sherds, 44 bone fragments, one piece of shell, three pieces of debitage, and two pieces of fire-cracked rock. Most of these artifacts were recovered from Section B (86%, n=63).

Feature 10

The Feature 10 palisade trench parallels Feature 9 closely, located about 0.75 m outside of Feature 9. There is also evidence in some places of an old line of palisade posts adjacent to Feature 10 which may have eventually merged into Feature 10 near the 70E gridline. Two contiguous sections of Feature 10 were excavated, between the 76E and 84E gridlines (Sections A and B). As with Feature 9, very little of these sections would have been exposed by Stewart's excavations. The width of the trench ranged from 0.17 to 0.20 m wide and anywhere from 0.09 to 0.22 m deep below the stripped surface, getting deeper to west. The base of the trench is basin-shaped to flat, and posts were identified in at the base of the feature in some places. About 23.45 m of this palisade were exposed by this project.

Both sections of Feature 10 were completely screened through 6.4 mm hardware cloth. Trench soils consisted of a dark brown (10YR3/3) loamy sand. A total of 225 artifacts was recovered from Sections A and B, including 109 ceramic sherds, 54 bone fragments, one piece of shell, 47 pieces of debitage, 11 pieces of fire-cracked rock, one pipe fragment, one unidentified ceramic, and one unmodified piece of limestone. Most of these artifacts were recovered from Section A (82%, n=184). This feature was radiocarbon dated to AD 1455–1655 (2-sigma calibrated range) (see Table 4).

Feature 11

Feature 11 is a palisade trench that roughly parallels Features 9 and 10, intersecting the Feature 27 palisade trench near the 70E gridline, about the same point that Feature 10 merges with the unnamed line of palisade posts. Feature 11 is cut by Feature 27, indicating that Feature 11 represents the earlier palisade. Two contiguous sections of Feature 11 were excavated, between the 76E and 84E gridlines (Sections A and B); none of these sections would have been exposed by Stewart's excavations. The width of the trench ranged from 0.15 to 0.24 m wide and anywhere from 0.09 to 0.20 m deep below the stripped surface, getting deeper to west like Feature 10. The base of the trench is basin-shaped to flat, and posts were identified in at the base of the feature in some places. About 20.41 m of this palisade were exposed by this project.

Both sections of Feature 11 were completely screened through 6.4 mm hardware cloth. Trench soils consisted of a dark brown (10YR3/3) loamy sand. A total of 50 artifacts was recovered from Sections A and B, including 25 ceramic sherds, 20 bone fragments, 4 pieces of debitage, and one piece of fire-cracked rock. Most of these artifacts were recovered from Section B (82%, n=41).

Feature 27

Feature 27 is a palisade trench that was identified west of the 73E gridline. This short section (7.45 m) of palisade trench represents the outermost palisade line until its intersection with Feature 11 near the 70E gridline, where it cuts through and postdates Feature 11. The trench appears to terminate east of the 73E gridline. It may be that Feature 27 originally merged with Feature 9 or 10, but the evidence is now lacking. This section of palisade trench was not identified until the final WMCAR mapping phase when plowzone remnants in the vicinity were removed. The feature measured about 0.14 m wide; no excavations were conducted with regard to this feature, and no artifacts were recovered.

MAIN DITCH AND DITCH EXTENSIONS

Feature 1

Feature 1 is a curved, linear ditch encircling portions of the Potomac Creek village. The ditch is located generally about 0.75 m inside the Feature 9 palisade trench, and 1.5 to 2.3 m outside of the Feature 8 palisade post line (see Figures 11 and 12). About 28.97 m of the ditch feature was exposed; the average width of the ditch, as measured *perpendicular to the trench walls* at each of 10 drawn profiles, is 0.85 m, ranging from 0.62 m to 1.23 m. This is *not* the same width as presented in the trench profile drawings, which are based on angled profiles cut by project gridlines (Figures 14 and 15). Average depth of the ten profiles is 0.24 m, ranging from 0.12 to 0.34 m below the stripped surface. The bottom of the ditch is irregular but generally basin-shaped except for Section C at the extreme southwestern end, where the base of the feature is fairly level. The elevation at the base of the ditch ranged from 98.630 m (relative to the site datum) in Section E at the southwest end of the feature to 99.035 m at the northeast end in Section A. The feature was excavated in 13 sections (A through M), cut into one or two meter sections using the north-south gridlines. For example, Section D is that portion of Feature 1 excavated between the 80E and 82E gridlines. A 2-m length of Feature 1 was left unexcavated between Section M and H, but has since been excavated by Mary Washington College under the direction of Dr. Doug Sanford; these results are pending.

Soils in the northeastern portion of the ditch (Sections I, B, and A) were consistently very dark grayish brown (10YR3/2) loamy sands; soils in the southwestern portion of the ditch (Sections C, E, and M), consisted of very dark brown (10YR2/2) loamy sands. Sections F, D, L, K, and J all lie partially or completely within the portion of the site previously excavated by Stewart (1992). Close examination of the southwestern profiles associated with Sections J, K, and F revealed two distinct strata within the ditch that were generally not recognized during excavation (except in Section K). In all three profiles, it appeared that the portion of the ditch roughly within Stewart's excavation area had been scooped out and refilled; soil differences were, however, very subtle, with very dark brown (10YR2/2) loamy sand identified on part of the profile and dark brown (10YR3/3) loamy sand identified in the other part. The portions of the ditch that were theoretically part of Stewart's earlier excavations did not exhibit consistent soil colors: in Sections F and D, the hypothetical "previously excavated portions" consisted of dark brown soil, but in Sections L and K these hypothetically excavated portions consisted of very dark brown soils. Generalizing from these specific soil descriptions, then, it appears that soils likely untouched by Stewart were very dark brown to very dark grayish brown, and soils in Feature 1 that may have been partially excavated by Stewart were dark brown to very dark brown. Soil color patterns suggest that portions of the ditch previously excavated by Stewart were likely refilled quickly and with little mixing, since texture differences were nonexistent and color differences were slight and difficult to observe. No posts were identified at the base of the feature.

Seven sections (A through G) were completely screened through 6.4 mm hardware cloth. Fill from five sections (H, J, K, L, and M) was screened, but recovery techniques were primarily trowel-sorting. Section I was screened entirely by volunteers. A total of 14,891 artifacts was recovered from Feature 1, including 4,887 ceramic sherds, 21 unidentified ceramic fragments, two miniature ceramic vessels, 61 unfinished bifaces, 6,730 pieces of bone, 29 lithic cores, 1,572 pieces of debitage, 455 pieces of fire-cracked rock, four pieces of formal ground stone (including a steatite bowl fragment, part of a slate celt, and part of a slate gorget), 34 hafted bifaces and biface fragments, 15 pieces of informal ground stone, two drills, 15 endscrapers, one other formal tool, 13 informal tools, 36 pipes and pipe fragments, 936 pieces of shell, 47 pieces of unmodified bog iron, 21 pieces of unmodified limestone, two pieces of unmodified slate, and eight other pieces of miscellaneous/unidentified stone. Feature 1 was radiocarbon dated to AD 1280–1415 (2-sigma calibrated range) (see Table 4).

Feature 15

Feature 15 is an extension of Feature 1 with regard to its spatial position; temporally, Feature 1 actually post-dates Feature 15, as described below. Feature 15 is a large, basin-shaped feature located directly adjacent to the outside of Feature 1 in the extreme southwest portion of the project area. The feature was very difficult to distinguish from Feature 1 at the surface, but the limits were identifiable during excavation and in profile. The Feature 15 is cut by Feature 1, and therefore appears to have been created *prior* to the ditch

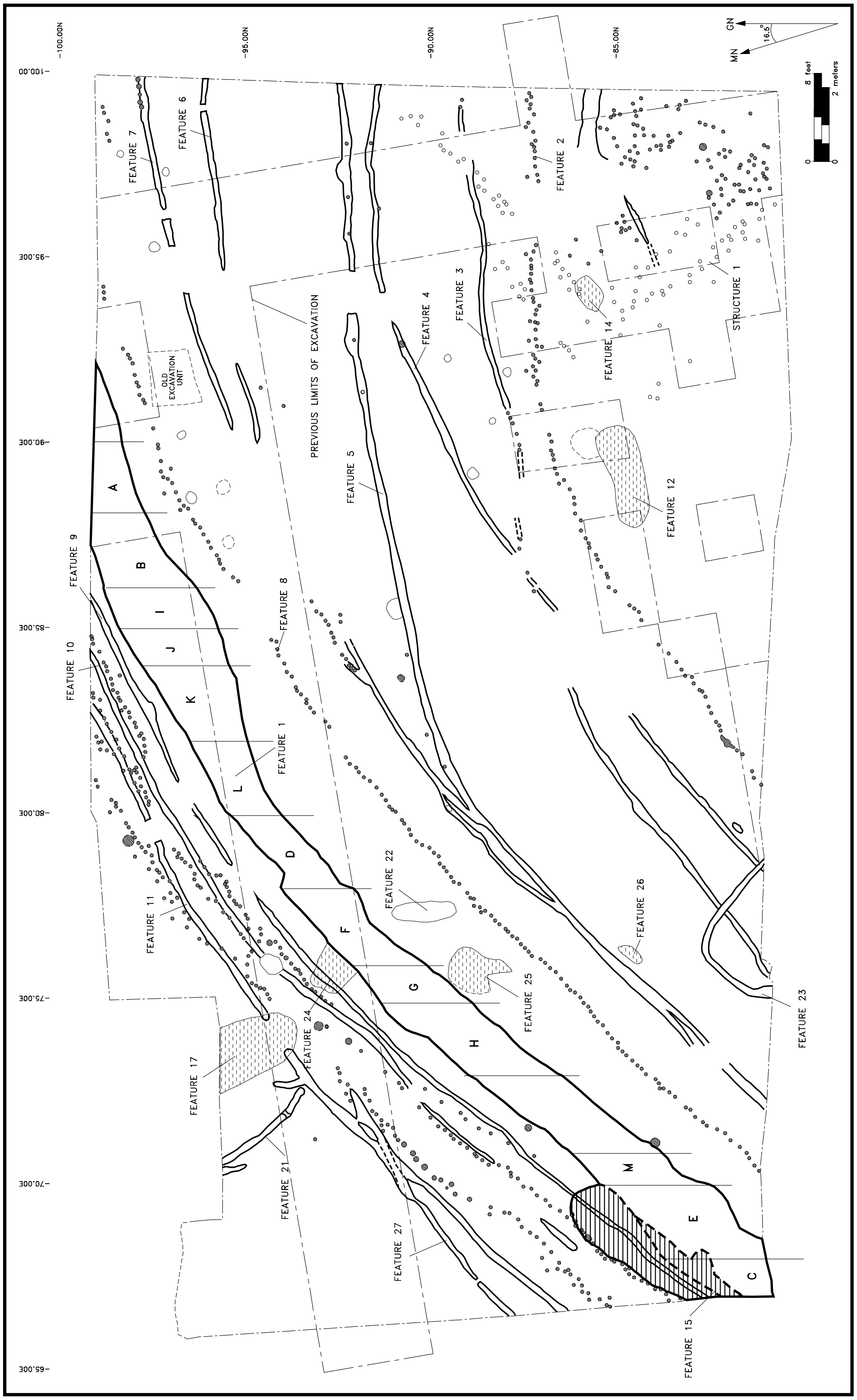


Figure 14. Site 44ST2, plan showing excavated sections of Feature 1 and overlay of previous excavations.

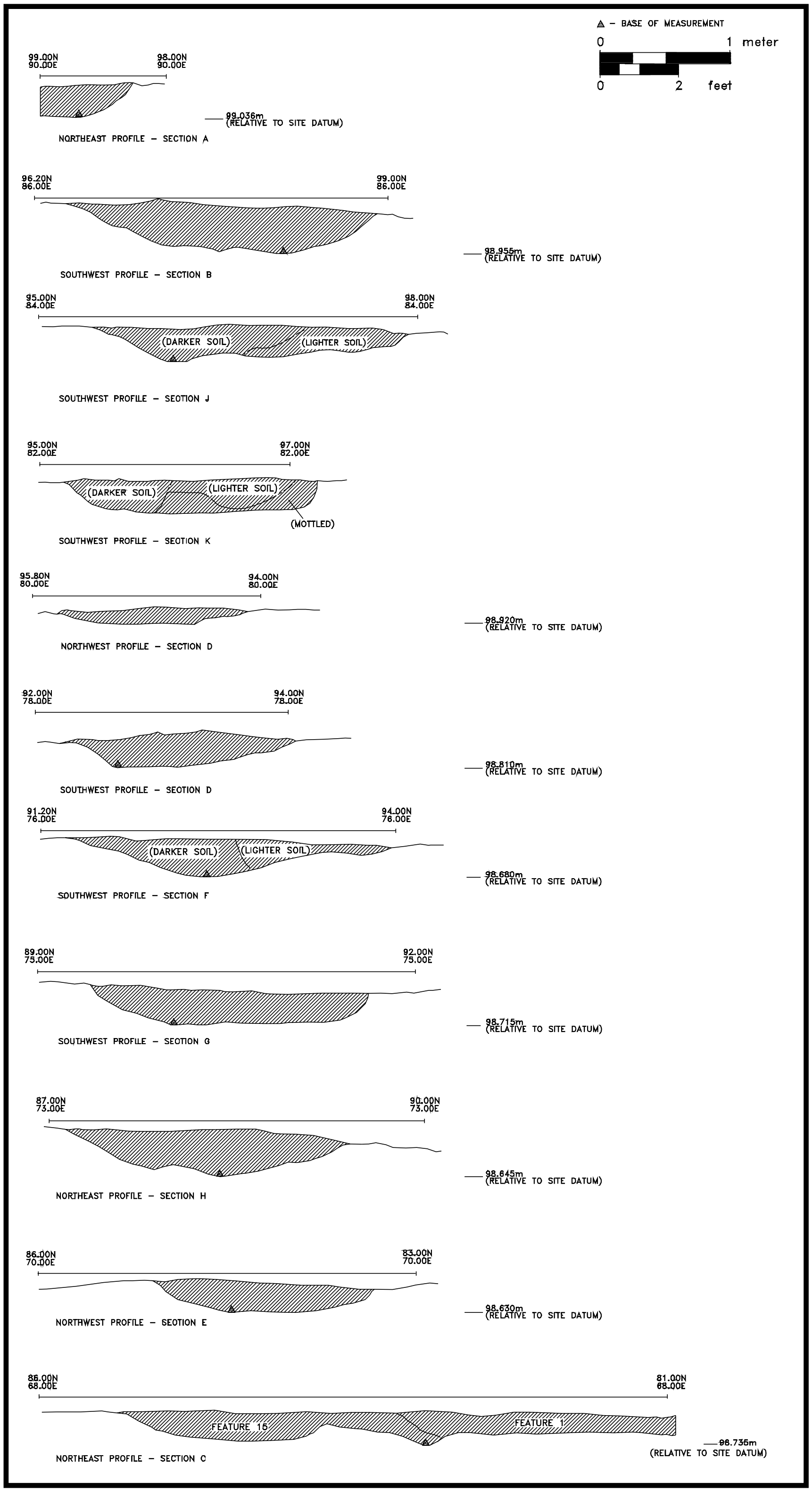


Figure 15. Site 44ST2, cross-sections of Feature 1 (for soil description, see facing page).

KEY

Sections I, B, and A - Very Dark Grayish Brown (10YR3/2) Loamy Sand
Sections C, E, and M - Very Dark Brown (10YR2/2) Loamy Sand
Sections J, K, and F (Lighter Soil) - Dark Brown (10YR3/3) Loamy Sand
Sections J, K, and F (Darker Soil) - Very Dark Brown (10YR2/2) Loamy Sand
Sections D, G, and H - Dark Brown (10YR3/3) Loamy Sand
Section K (Lighter Soil) - Dark Brown (10YR3/3) Silty Loam
Section K (Darker Soil) - Very Dark Brown (10YR2/2) Silty Loam
Section K (Mottled Soil) - Dark Yellowish Brown (10YR3/4) Sandy Loam
Mottled with Light Gray (10YR7/2) Sandy Loam and Yellowish Brown (10YR5/8) Sandy Clay

Figure 15 soil descriptions; see figure facing page.

construction. The Feature 9 palisade trench is visible in the east and west walls of Feature 15, as well as at the base of the feature. No evidence of Feature 9 was identified in the Feature 15 fill or in the bisecting profile, so Feature 15 appears to post-date this palisade trench. The feature measures 0.84 m northwest-southeast by at least 2.37 m northeast-southwest; the southwestern end of the feature is truncated by the western edge of the project area. In profile, the feature extends 0.22 m below the stripped surface to an elevation of 98.655 m relative to the site datum.

The feature was bisected into two roughly equal halves (east and west); the western half was removed first and completely screened through 6.4 mm hardware cloth. After recording an east-facing profile, the eastern half was removed and also completely screened through 6.4 mm hardware cloth. Soils consisted of a very dark brown (7.5YR2.5/2) loamy sand. A total of 1,492 artifacts was recovered from the combined east and west halves, a density similar to the adjacent Feature 1 ditch. These artifacts include 368 ceramic sherds, three pieces of unidentified ceramic, two pipe fragments, 869 bone fragments, 106 pieces of shell, four quartz bifaces, six quartz cores, 59 pieces of debitage, 52 pieces of fire-cracked rock, five small triangular hafted bifaces, three quartz endscrapers, one quartz sidescraper, two informal tools, five pieces of unmodified bog iron, and seven pieces of unmodified limestone.

Feature 24

Feature 24 is a medium-sized, amorphous feature in the western portion of the project area, about 0.96 m south of Feature 17 and directly adjacent to the outer edge of the large ditch (Feature 1). The feature cuts and appears to post-date the Feature 1 ditch. As with Feature 15, the Feature 9 palisade trench is visible in the east and west walls of Feature 24, as well as at the base of the feature. No evidence of Feature 9 was identified in the Feature 24 fill, so Feature 24 appears to post-date this palisade trench. The feature measures 1.0 m north-south and 0.88 m east-west. The feature was shallow and somewhat irregular at the base, roughly flat but uneven. In profile, the feature extended 0.09 m below the stripped surface to an elevation of 98.820 m relative to the site datum.

The feature was sectioned into north and south halves, with the south half screened through 6.4 mm hardware cloth. After the north-facing profile was recorded, the northern half was removed as well, but artifact recovery was limited to trowel-sorting in the screen. Soils consisted of a very dark grayish brown (10YR3/2) loamy sand. A total of 63 artifacts was recovered from the combined halves, including 60 (95%) from the screened south half and only three (5%) from the trowel-sorted north half. The total assemblage consists of three ceramic sherds, 34 bone fragments, one pipe fragment, 22 pieces of debitage, and three pieces of unmodified limestone.

BASIN FEATURES

Feature 12

Feature 12 is a large, oblong basin in the southeast portion of the project area, inside the innermost line of palisade posts identified within the project area (Feature 2). The feature measures 2.7 m east-west × 0.84 m north-south (Figure 16). The feature was basin-shaped, extending 0.18 m below the stripped surface to an elevation of 99.470 m relative to the site datum (Figure 17).

The feature was bisected into two roughly equal halves (east and west); the western half was removed first and completely screened through 6.4 mm hardware cloth. After recording an east-facing profile, the eastern half was removed as well, but artifact recovery was limited to trowel-sorting in the screen. Two soil zones were identified at the surface of Feature 12. Feature 12a soils consisted of very dark grayish brown (10YR3/2) loamy sand. The remnants of an earlier fill episode, designated as Feature 12c, were identified at the western end of the feature. The Feature 12c soils were visible on the surface, but sloped sharply eastward down to the base of the feature and did not appear in the east profile. Soil in Feature 12c had the same general texture and Munsell color reading as the rest of Feature 12, but was visually lighter and texturally more compact, and was excavated separately. The charcoal sample used for radiocarbon dating was retrieved from the Feature 12a portion, as were the soil samples; the relatively small volume of Feature 12c precluded adequate soil sampling. When the eastern half of Feature 12 was removed, only Feature 12a soils were evident.

A total of 1,755 artifacts were recovered from Feature 12, including 1,147 (65%) from the screened west half, 599 (34%) from the trowel-sorted east half, and nine (1%) artifacts recovered from the surface of the feature. The artifact assemblage from the combined halves and surface of Feature 12a (but not including artifacts from 12c) is comprised of 1,574 artifacts, including 233 ceramic sherds, one clay pipe fragment, three unidentified ceramic fragments, five unfinished quartz bifaces, one bipolar quartz core, one small triangular hafted biface, one midsection of an unidentified hafted biface, one quartz endscraper, one other formal tool, 113 pieces of debitage, one quartzite hammerstone, two pitted informal ground stone pieces, 44 pieces of fire-cracked rock, three pieces of unmodified limestone, eight pieces of unmodified bog iron, 1,009 bone fragments, and 146 pieces of shell. As noted above, the compact, lighter-colored soils that remained in the west half (Feature 12c) were screened separately; about 10% (n=181) of the 1,755 artifacts recovered from Feature 12 were found in Feature 12c soils, including 36 ceramic sherds, six unidentified ceramics, 106 bone fragments, three bipolar quartz cores, 12 pieces of quartz debitage, three pieces of fire-cracked rock, and 15 pieces of shell. The original function of Feature 12 is unknown; it appears to have been eventually used as a refuse pit, perhaps related to Structure 1 located about 2.88 m east of the feature. Feature 12 was radiocarbon dated to AD 1425–1640 (2-sigma calibrated range) (see Table 4).

An area of brown (10YR4/3) loamy sand was identified at the surface adjacent to Feature 12. This area was mottled and amorphous, with poorly defined edges, and was judged to represent a natural disturbance; it is referred to as Feature 12b on the plan map, but it does not join with Feature 12 and was not excavated. Feature 13, just north of Feature 12, is very similar to Feature 12b, and consists of mottled, dark brown (10YR3/3) loamy sand; this feature was also considered to be a natural disturbance, and was not excavated.

Feature 17

Feature 17 is a large, oblong basin in the northwest portion of the project area, oriented roughly north-south. Feature 17 post-dates Feature 11, the outermost palisade trench identified by these investigations. The

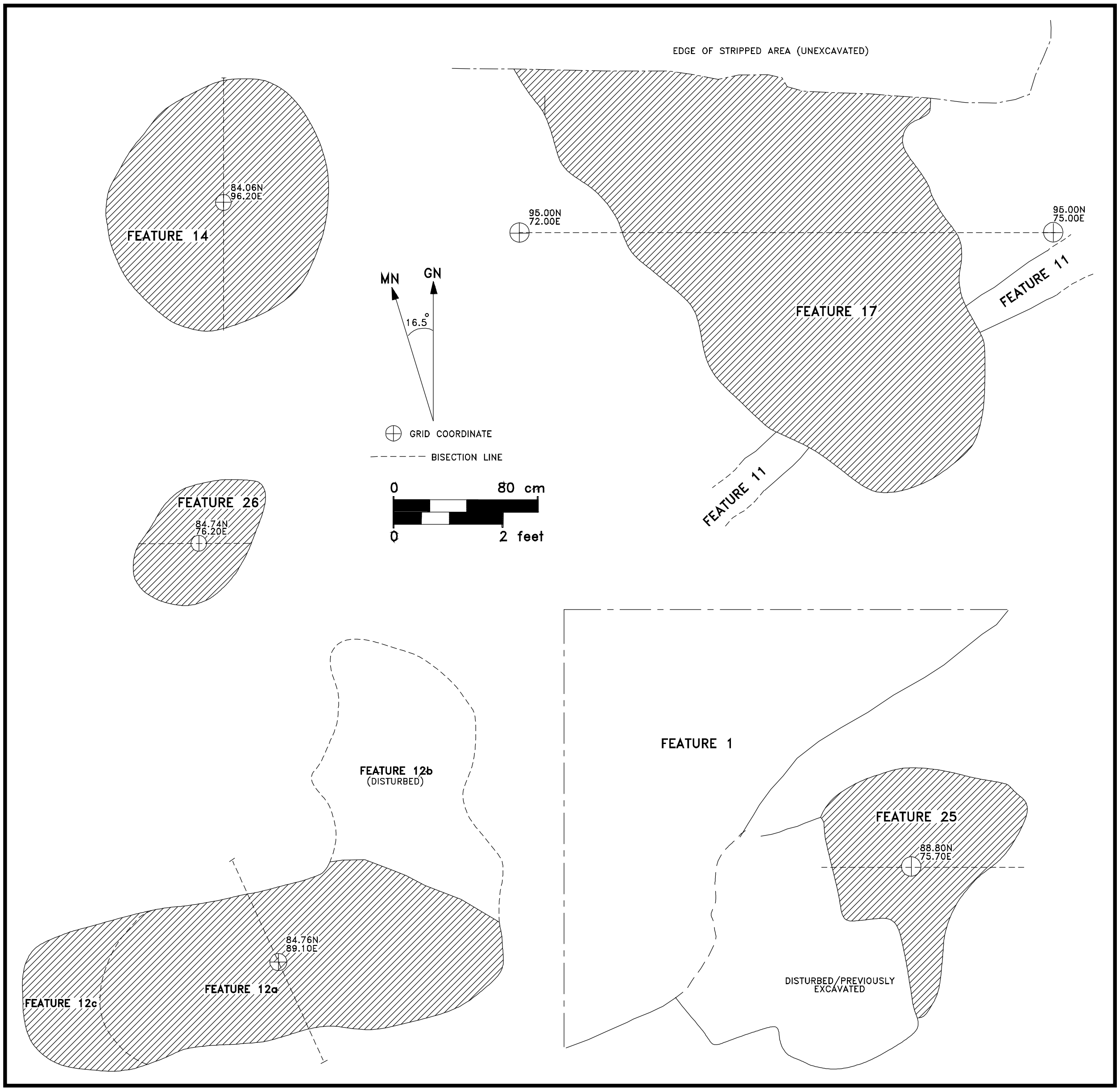
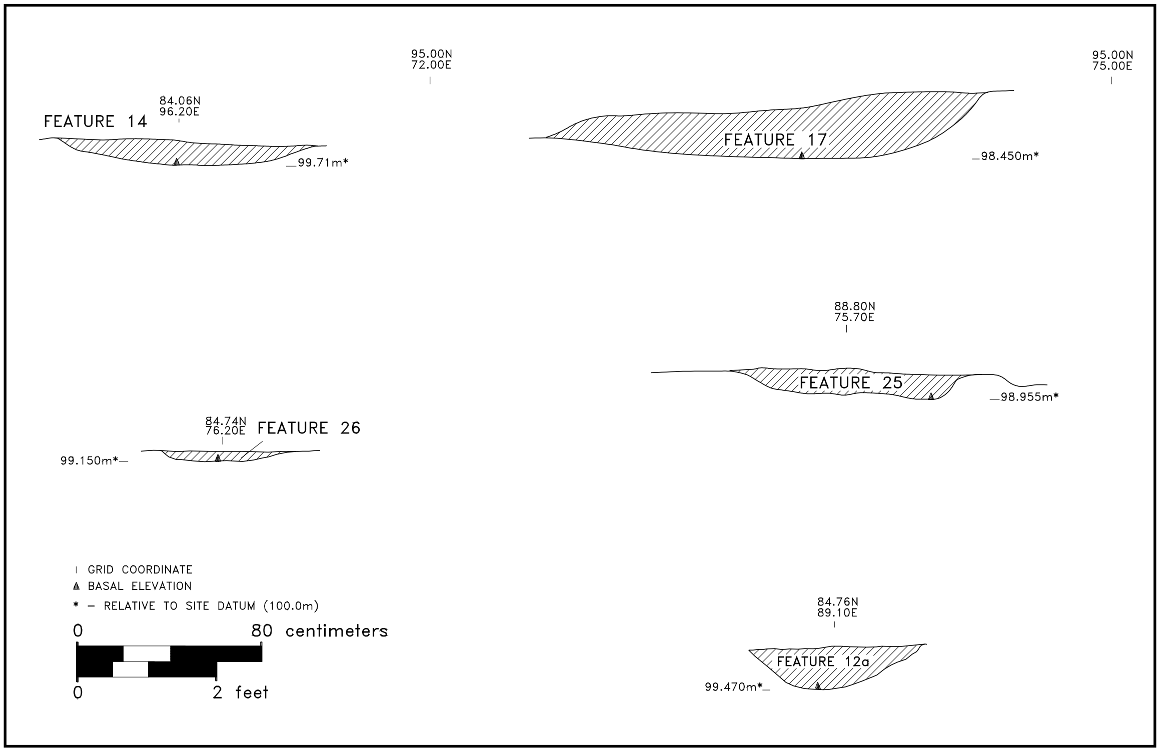


Figure 16. Site 44ST2, plans of pit features.



KEY

Feature 14 - Very Dark Grayish Brown (10YR3/2) Loamy Sand
Feature 17 - Dark Brown (10YR2/2) Loamy Sand
Feature 26 - Dark Brown (10YR3/3) Loamy Sand
Feature 25 - Very Dark Gray (10YR3/1) Loamy Sand
Feature 12a - Very Dark Grayish Brown (10YR3/2) Loamy Sand

Figure 17. Site 44ST2, cross-sections of pit features.

Feature 11 palisade trench was clearly visible at the east and west edges of Feature 17, but the palisade trench outline was not evident within the Feature 17 fill. Feature 21, running parallel to and about 1.15 m west of Feature 17, is a narrow trench, morphologically similar but perpendicular to the Feature 11 palisade trench. It does not, however, connect with Feature 11, and its relationship to Feature 17, if any, is unknown.

Feature 17 measures 1.5 m east-west; the northern end of the feature was not uncovered when the site was stripped due to landowner restrictions, but 2.6 m of the north-south length were exposed. The feature was basin-shaped, extending to about 0.28 m below the stripped surface along the north profile; the elevation relative to the site datum was 98.450 m at the base.

The feature was excavated in two halves, with the southern portion removed first (bisected by the 95N gridline) and completely screened through 6.4 mm hardware cloth. After recording a north-facing profile, the northern half was removed as well, but artifact recovery was limited to trowel-sorting in the screen. Soils consisted of dark brown (10YR2/2) loamy sand. The soil was somewhat sandier on the east side and center of the feature, associated with a distinctly higher artifact density; there was, however, no discernable stratification within the feature.

A total of 748 artifacts were recovered from Feature 17, most of them (72%, n=538) from the screened south half. Artifacts recovered include 283 ceramic sherds, one clay pipe fragment, two pieces of unidentified ceramic, one quartzite core, one small triangular hafted biface, 75 pieces of debitage, 31 pieces of fire-cracked rock, 327 bone fragments, 26 pieces of shell, and one piece of unmodified bog iron. The original function of Feature 17 is unknown; it may have eventually been used as a refuse pit outside of the palisade walls. This feature was radiocarbon dated to AD 1260–1410 (2-sigma calibrated range) (see Table 4).

Feature 25

Feature 25 is a medium-sized, relatively amorphous basin in the western portion of the project area, about 3.85 m south of Feature 17 on the inside edge of the Feature 1 ditch, a little further south and west of Feature 24. The feature has been partially truncated by an old test unit or other modern disturbance. The portion remaining measures 1.4 m north-south × 0.9 m east-west. The feature was basin-shaped and relatively shallow, extending 0.12 m below the stripped surface to an elevation of 98.955 m relative to the site datum.

The feature was sectioned into north and south halves, with the north half screened through 6.4 mm hardware cloth. After the south-facing profile was recorded, the northern half was removed as well, but artifact recovery was limited to trowel-sorting in the screen. Soils consisted of a very dark gray (10YR3/1) loamy sand. A total of 385 artifacts was recovered from the combined halves, including 286 (74%) from the screened north half and 99 (26%) from the trowel-sorted south half. The total assemblage consists of 139 ceramic sherds, one unidentified ceramic fragment, 154 bone fragments, one quartz core fragment, one quartz endscraper, one unidentified hafted biface fragment, 32 pieces of debitage, six pieces of fire-cracked rock, and 50 pieces of shell. The original function of Feature 25 is unknown; it appears to have eventually been used as a refuse pit along the palisade walls. This feature was radiocarbon dated to AD 950–1215 (2-sigma calibrated range) (see Table 4).

Feature 14

Feature 14 is a small, roughly circular basin in the southeast portion of the project area, right at the northwest corner of Structure 1. The feature measured between .65 m and .70 m in diameter, and was basin-shaped and very shallow, extending only 0.05 m below the stripped surface to an elevation of 99.710 m relative to the site datum.

The feature was bisected into two roughly equal halves (east and west); the western half was removed first and completely screened through 6.4 mm hardware cloth. An east-facing profile was recorded, but the eastern half of the feature was not excavated. Soils consisted of very dark grayish brown (10YR3/2) loamy sand. A total of 28 artifacts was recovered from the west half, including eight ceramic sherds, 11 bone fragments, five pieces of quartz debitage, one piece of fire-cracked rock, and three pieces of shell. The function of Feature 14 remains unknown, although it could represent the remnants of a shallow refuse pit that has since been mostly plowed away.

Feature 26

Feature 26 is a small, slightly oval basin in the southwest portion of the project area, only about 0.18 m inside of the Feature 5 palisade trench. The feature measured 0.62 m east-west × 0.76 m north-south. The feature was basin-shaped and very shallow, extending only 0.04 m below the stripped surface to an elevation of 99.150 m relative to the site datum.

The feature was bisected into two roughly equal halves (north and south); the southern half was removed first and completely screened through 6.4 mm hardware cloth. After recording a north-facing profile, the northern half was removed as well and also completely screened through 6.4 mm hardware cloth. Soils consisted of a dark brown (10YR3/3) loamy sand. A total of 46 artifacts was recovered from the combined feature halves, including 15 ceramic sherds, one clay pipe fragment, 25 bone fragments, three pieces of quartz debitage, one fire-cracked rock, and one piece of unmodified bog iron. The function of Feature 26 remains unknown, although it could represent the remnants of a shallow refuse pit that has since been mostly plowed away.

STRUCTURAL FEATURES

Feature 23

Feature 23 appears to represent a portion of a wall trench structure that has been truncated by the southern edge of the project area. The feature cuts palisade trench Features 3 and 4, post-dating both. About 2.69 m of the northeast wall (Section A) of the structure and 1.92 m of the northwest wall (Section B) were exposed and excavated (Figure 18). The trench varied from 0.16 to 0.20 m wide and 0.10 to 0.13 m deep below the stripped surface.

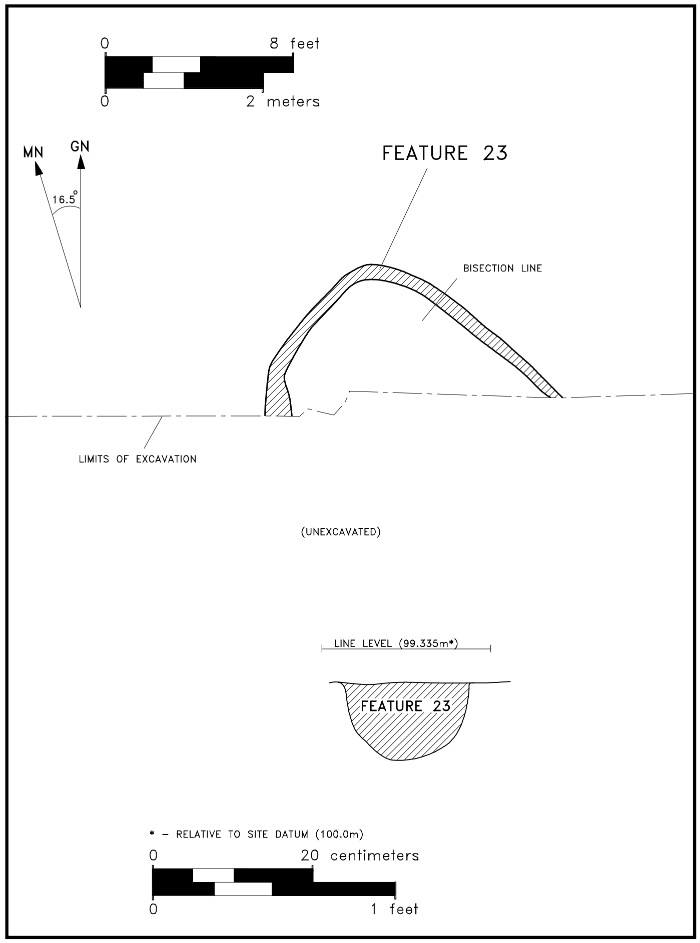
All of the fill was completely screened through 6.4 mm hardware cloth. Soils were comprised of dark brown (10YR3/3) loamy sand; posts were identified at the base of the trench in some places. A total of 85 artifacts were recovered, including 13 ceramic sherds, 54 bone fragments, 12 pieces of debitage, four pieces of fire-cracked rock, one piece of shell, and one unfinished biface. This feature was radiocarbon dated to AD 1260–1300 (2-sigma calibrated range) (see Table 4). More of this feature has since been exposed by Mary Washington College, and these results are pending.

Feature 21

Feature 21 is a short length of trench running northwest-southeast, parallel to the long axis of the Feature 17 basin and perpendicular to (but not connected with) the Feature 11 palisade trench. The trench is about 2.69 m long, 0.10 to 0.20 m wide, and 0.07 to 0.15 m deep below the stripped surface. Soils consisted of a dark brown (10YR3/3) loamy sand. The location and position of the feature suggest that it may represent part of a defensive bastion. A total of 38 artifacts were recovered, including 22 ceramic sherds, 10 bone fragments, three pieces of debitage, two pieces of fire-cracked rock, and one piece of unmodified limestone.

Structure 1

Portions of two walls of Structure 1 were exposed by this project, in the southeastern corner of the project area. Unlike the Feature 23 structure, Structure 1 is defined by paired postholes forming the north and west walls of the structure (Figure 19). Basin Features 14 and 12 are located nearby or directly adjacent to Structure 1, and a group of unpatterned postmolds are concentrated within the interior of the structure. The posts are, on average, about 0.12 m in diameter; none of the posts were excavated, and no soil samples were taken. The relationship of the structure to palisade trench Features 3 and 4, both of which cross the structure,



KEY

Feature 23 - Dark Brown (10YR3/3) Loamy Sand

Figure 18. Site 44ST2, plan and profile of Feature 23.

is currently undetermined. The structure measured at least 4 × 6 m and was generally rectilinear in outline. Roughly parallel lines of doubled postholes indicate that the building may have been reconstructed at least once.

MISCELLANEOUS FEATURES

Feature 22

Feature 22 was originally thought to be an oblong, basin-shaped pit similar to Feature 12 or Feature 17. After excavation, the feature was revealed as probably non-cultural in origin, perhaps an incidental depression. The feature measured 1.68 m north-south × 0.48 m east-west, extending only 0.06 m below the stripped surface to an elevation of 99.045 m relative to the site datum. Soils were comprised of dark brown (10YR3/3) loamy sand, like most other features, but the base of the feature was irregular, with poorly defined edges. Only the south half was excavated, recovering an assemblage of 31 artifacts that include nine ceramic sherds, nine bone fragments, twelve pieces of debitage, and one piece of fire-cracked rock.

Feature 13

This anomaly was recorded by CRI immediately north of Feature 12. Upon investigation during the WMCAR data recovery, the faintly discolored area was determined to be noncultural in origin, potentially representing a tree disturbance.

Feature 16

The southern half of Feature 16 was excavated, revealing the feature to be a tree just south of Section B of the Feature 6 palisade trench. A single piece of quartz debitage was recovered; no further excavations were conducted, and the feature does not appear on the WMCAR site plan.

Feature 20

Feature 20 was initially thought to be a cultural trench feature, but was revealed in excavation to be a tree root trace. The feature was located just north of and at an angle to Section A of Feature 11.One ceramic sherd and one piece of bone were recovered; no further excavation was conducted, and the feature does not appear on the WMCAR site plan.

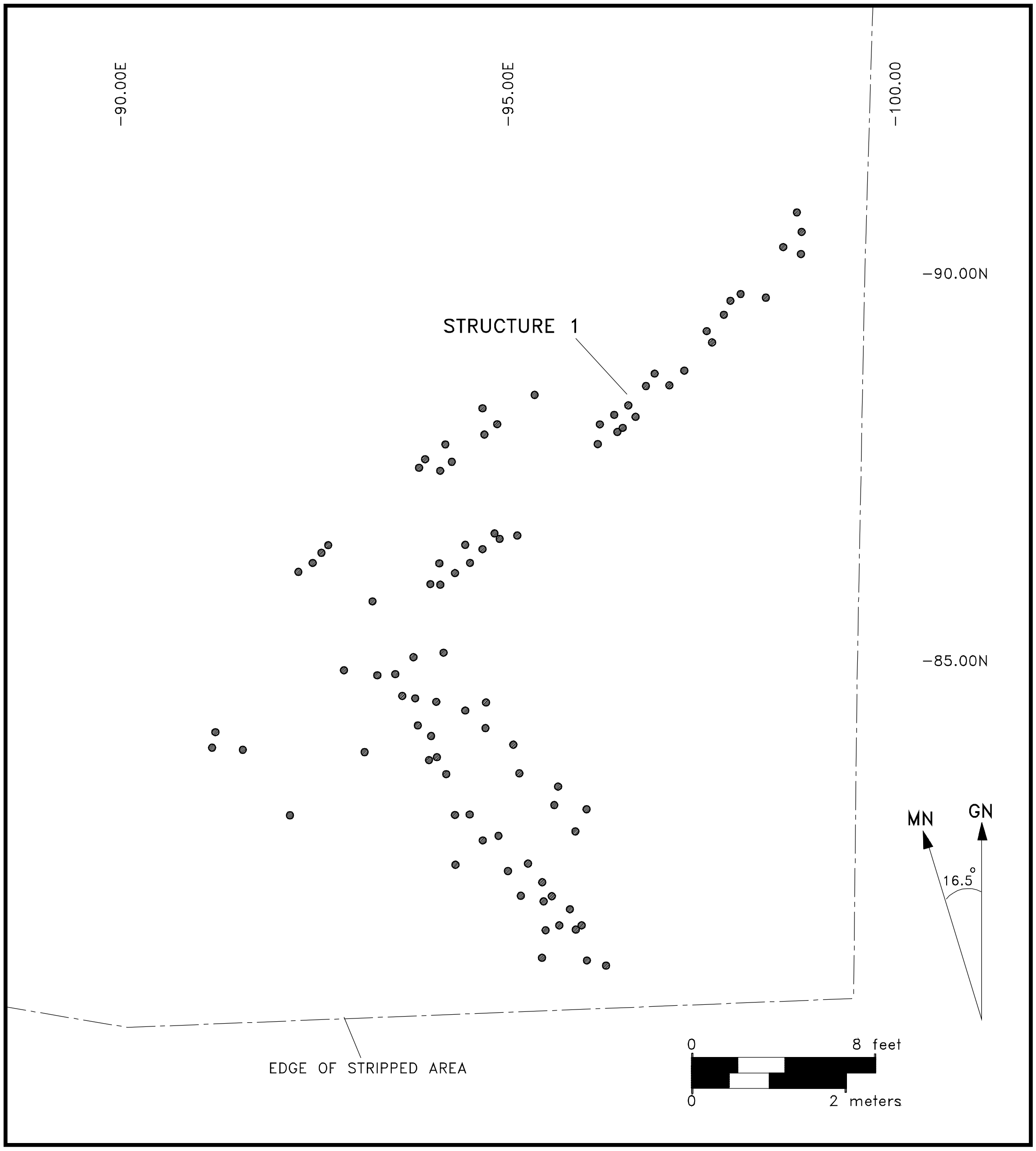


Figure 19. Site 44ST2, plan of Structure 1.

CHAPTER 4:
Description of Artifacts

INTRODUCTION

This second stage of data recovery in the proposed drain field parcel produced a total of 22,137 artifacts, a count that includes 118 pieces of unmodified stone also returned to the lab. The complete inventory of artifacts is provided in Appendix A. The sample can be summarized according to major artifact groups as follows: 6,946 (31%) ceramic sherds, 99 (<1%) other ceramic artifacts, 2,497 (11%) flaked stone artifacts, 797 (4%) other stone artifacts, 23 (<1%) ground stone items, and 11,701 (53%) faunal/floral remains (most of which [n=9,872] is animal bone). Distributional analysis of artifacts from the first stage of data recovery conducted by CRI is discussed in Chapter 3 (see Figures 7–10).

Artifacts are described in this chapter according to usual categories. Readers are reminded that some artifact classes were described more thoroughly than others, and explanations are provided in Chapter 2. The intention was to maximize information return within project constraints, and emphasis was placed on the kinds of physical remains from this site that had not been fully described in the past.

ASSESSMENT OF PREHISTORIC CERAMIC TECHNOLOGY

ANALYSIS PROCEDURES/OVERVIEW OF ASSEMBLAGE

A total of 6,946 sherds were recovered from 44ST2. Because time and budget constraints prevented a complete analysis of the entire assemblage, these sherds were initially sorted by size. All sherds larger than 2.5 cm in diameter (n=1,951) were divided by vessel portion, and then by surface treatment and temper (Table 6). A sample of sherds less than 2.5 cm in diameter from each of the primary features were also fully described (n=1,578); the remainder (n=3,417) were only counted and listed by feature (Table 7). Because no significant differences in the >2.5-cm and <2.5-cm samples were detected, all further analysis was based entirely on the >2.5-cm sample.

The >2.5-cm sample includes 214 rim sherds, 1,490 body sherds, 243 basal sherds, three vessels, and one appendage. Cord marking was the predominant surface treatment; smoothed or plain surfaces were also common (see Table 6). Only three other surface treatments represented by 22 sherds were present. These are fabric impression, simple stamping, and net impression. Most of the assemblage was either grit or sand and grit-tempered; smaller numbers of sand, micaceous sand, angular/crushed grit, limestone, shell, and untempered sherds were also identified (see Table 6). The distribution of surface treatment and temper in major features is summarized in Tables 8–11.

For this project, sand has been defined as lithic temper with an average particle size of less than 1 mm in diameter. Coarse sand may occasionally contain some particles that are over 1 mm; however, no particles are ever larger than 2 mm. Sand within the current 44ST2 sample is typically very fine, with particles well under 1 mm. Grit is composed of lithic material with an average particle size larger than 2 mm in diameter. Temper with an average particle size between 1 and 2 mm may also be placed within this category if no sand is present. In general, grit includes primarily rounded, subrounded, and subangular particles, although small amounts of crushed inclusions may be present. Grit temper is not associated with any particular raw material; however, in the 44ST2 collection the primary constituent is quartz. Other materials, including quartzite and

Surface Treatment	Sand	Sand and Grit	Grit	Angular/ Crushed Grit	Micaceous Sand	Limestone	Shell	No Temper	Total
Cord-marked	48	690	504	43	5	19	11	6	1326
Smoothed	18	235	152	8	2	8	5	3	431
Plain	14	21	5	9	6	–	2	51	108
Fabric-impressed	–	–	–	–	–	–	19	–	19
Simple-stamped	–	1	–	–	–	–	–	–	1
Net-impressed	–	2	–	–	–	–	–	–	2
Unidentifiable	5	30	11	13	1	–	4	–	64
Total	**85**	**979**	**672**	**73**	**14**	**27**	**41**	**60**	**1951**

Table 6. Site 44ST2, surface treatment and temper for all ceramics >2.5 cm

Surface Treatment	Sand	Sand and Grit	Grit	Angular/ Crushed Grit	Micaceous Sand	Limestone	Shell	No Temper	Unid.*	Total
Cord-marked	67	385	204	25	4	10	2	3	–	700
Smoothed	13	146	133	12	1	–	2	1	–	308
Plain	17	74	4	8	–	–	4	60	–	167
Fabric-impressed	–	–	–	–	–	–	23	1	–	24
Simple-stamped	1	–	1	–	–	–	1	–	–	3
Net-impressed	–	1	–	–	–	–	–	–	–	1
Unid.	68	175	74	9	1	3	21	24	3417	3792
Total	**166**	**781**	**416**	**54**	**6**	**13**	**53**	**89**	**3417**	**4995**

Unid. = unidentifiable

Table 7. Site 4ST2, surface treatment and temper for all ceramics <2.5 cm.

sandstone, are also present. The sand and grit category is used to describe sherds containing a combination of the two temper types. Angular/crushed grit temper is defined as lithic material that has been intentionally and completely crushed. Due to crushing, particle size within this category is usually more uniform, often averaging between 1 and 2 mm in diameter. This type of temper usually comprises a high percentage of the paste. Angular/crushed grit within the 44ST2 sample is primarily composed of quartz. The micaceous sand temper classification is used to distinguish a specific group of sherds that contain a high percentage of medium to large flakes of golden mica in combination with a medium-grained sand.

A study of vessel form was possible due to the number of relatively large sherds recovered, most of which are from the ditch (Feature 1). All rim and decorated sherds were examined and crossmended when possible. These sherds were then divided by vessel form. Using these fragments a minimum of 212 separate vessels was identified. Sixty-three of the vessels were rims with measurable diameters (sherds at least 5 cm wide). It is important to note that rim diameter measurements may be imperfect because the vessel openings are not always symmetrical and therefore may not be consistent in curvature.

Feature No.	Cord-Marked	Smoothed	Plain	Fabric-Impressed	Net-Impressed	Unid.	Total
1	1027	341	88	14	2	45	1517
12	46	15	5	–	–	2	68
15	120	25	4	3	–	3	155
17	47	9	3	–	–	5	64
25	23	6	–	–	–	1	30
26	2	–	1	–	–	–	3
Total	**1265**	**396**	**101**	**17**	**2**	**56**	**1837**

Table 8. Site 44ST2, surface treatment for ceramic artifacts >2.5 cm from major features.

Feature No.	Sand	Sand and Grit	Grit	Angular/ Crushed Grit	Micaceous Sand	Limestone	Shell	No Temper	Total
1	54	790	499	54	12	27	31	50	1517
12	15	16	21	11	1	–	1	3	68
15	4	57	80	5	1	1	4	3	155
17	6	35	22	–	–	–	–	1	64
25	1	16	13	–	–	–	–	–	30
26	–	2	1	–	–	–	–	–	3
Total	**80**	**916**	**636**	**70**	**14**	**28**	**36**	**57**	**1837**

Table 9. Site 44ST2, temper types for ceramics >2.5 cm from major features.

Surface Treatment	Sand	Sand and Grit	Grit	Angular/ Crushed Grit	Micaceous Sand	Limestone	Shell	No Temper	Total
Cord-marked	32	556	371	30	3	18	11	6	1027
Smoothed	9	194	114	7	2	9	3	3	341
Plain	9	16	5	9	6	–	2	41	88
Fabric-impressed	–	–	–	–	–	–	14	–	14
Net-impressed	–	2	–	–	–	–	–	–	2
Unidentifiable	4	32	9	8	1	–	1	–	55
Total	**54**	**800**	**499**	**54**	**12**	**27**	**31**	**50**	**1527**

Table 10. Site 44ST2, surface treatment and temper for ceramics >2.5 cm from Feature 1.

Surface Treatment	Sand	Sand and Grit	Grit	Angular/ Crushed Grit	Micaceous Sand	Shell	No Temper	Total
Cord-marked	7	13	16	9	1	–	–	46
Smoothed	6	3	5	–	–	1	–	15
Plain	2	–	–	–	–	–	1	3
Unidentifiable	–	–	–	2	–	–	–	2
Total	**15**	**16**	**21**	**11**	**1**	**1**	**1**	**66**

Table 11. Site 44ST2, surface treatment & temper for ceramics >2.5 cm from Feature 12.

Typological divisions were made based on attributes such a temper, paste, and surface treatment. The results indicate that the majority of sherds are representative of the Late Woodland period. However, a minimal number of Middle Woodland ceramics were also identified.

TYPE DESIGNATIONS AND TEMPORAL AFFILIATIONS

Middle Woodland

Two net-impressed and sand and grit-tempered sherds were identified in the >2.5 cm sample. These sherds were not assigned to a specific type category. However, due to their overall surface treatment, temper, and paste they are believed to be representative of the Middle Woodland period. These sherds share paste and temper qualities with several net impressed Middle Woodland types identified to the south of 44ST2 in the James River drainage. They may represent a local variant of one of these wares. Both were recovered from Feature 1, Section K.

Late Woodland

A total of 1,884 Late Woodland ceramic sherds >2.5 cm were identified at 44ST2. The majority of these sherds fall within the parameters of Potomac Creek ware and probably originated at or near 44ST2. Minimal numbers of other Late Woodland ceramics including Townsend and Keyser wares were also recovered. Paste and temper characteristics of the 64 sherds with unidentifiable surface treatments also indicate that they are probably of Late Woodland origin.

Potomac Creek Wares

This ware was first described by W. H. Holmes (1903:55–156) based on surface collection material from the Potomac Creek site. Recent research has often used refinements of this type compiled by Stephenson et al. (1963) based on ceramics from Maryland's Accokeek Creek site. Traditionally, Potomac Creek vessels have been defined as having either cord-marked or plain (smoothed) surfaces. Their temper has been described as crushed quartz and/or fine to medium grained sand with a compact and hard paste. Vessels are coil constructed with globular bodies, everted or straight rims, and rounded bases. Vessel walls are relatively thin. Two main types, Potomac Creek Cord-Impressed and Potomac Creek Plain, are recognized within this ware (Figures 20 and 21). In addition, sherds that fall into categories previously designated as Potomac Creek Sand-Tempered or Moyaone ware have also been included in this discussion due to shared ceramic characteristics and provenience. Potomac Creek ware is believed to date from AD 1200 to the seventeenth century (Potter 1993:125).

The original definition of Potomac Creek ware included two types: Potomac Creek Cord-Impressed and Potomac Creek Plain (Stephenson et al. 1963:113). The primary characteristics of Potomac Creek Cord-Impressed were corded decoration and cord-marked surface treatment. It is noted that "decoration is always present..." on Potomac Creek Cord-Impressed sherds (Stephenson et al. 1963:115). Potomac Creek Plain was defined as having plain or smoothed surfaces with little or no decoration. In a recent discussion of Potomac Creek ceramics, Stephen Potter redefines the cord-impressed variety as Potomac Creek Cord-Marked based on its surface treatment (Potter 1993). This new designation is more useful because decoration is usually restricted to rim and neck sherds, and some vessels were not decorated at all. This report will also use the designation Potomac Creek Cord-Marked.

The Potomac Creek ceramic sample examined during this study has indicated that temper within this ware may vary from what has been characterized in previous descriptions. In what is perhaps the most often used definition, Stephenson et al. (1963:115) state:

> Temper is predominately of angular crushed quartz with occasional inclusions of other crushed, hard rock or coarse sand. Temper particles are 1 to 4 mm in diameter, but usually about 2 mm. A minority of sherds is tempered with coarse to medium sand but with small amounts of crushed quartz.

In the current 44ST2 sample, rounded to sub-angular grit alone or in combination with a fine- to medium-grained sand rather than crushed quartz predominate Potomac Creek temper. This generally agrees with descriptions in Schmitt's 1942 anaylsis (Stewart 1992:40), which referred to "coarse" and "fine" gravel. Coarse gravel was defined as "a quartz gravel apparently obtained from the beach of Potomac Creek..." with particles ranging in size from 1 to 7 mm (Stewart 1992:40). The rounded to subangluar grit particles identified during the WMCAR analysis are consistent with the coarse-grained portion of river sand. Fine gravel was defined as a variation of coarse gravel with particle sizes running consistently smaller (due to crushing of larger particles), with an average size of 1 mm or smaller (Stewart 1992: 40). This material would most likely be equivalent to the WMCAR'S sand and grit or angular/crushed grit categories.

There were 1,807 sherds of Potomac Creek ware identified in the collection. These sherds were divided into three surface treatment and five temper categories (Table 12).Various combinations of these two traits can be used to classify the sherds into four subcategories.

Potomac Creek Cord-Marked. This type includes 1,285 sherds and is primarily distinguished by its surface treatment (Figure 22). All sherds assigned to this group are cord-marked with either sand, sand and grit, grit, or crushed/angular grit temper. Vessel paste was always hard and compact, and often included fine micaceous sand. Every variation of temper and paste present was also observed in the Potomac Creek Plain subcategory. A wide range of sherd colors occurred; however, tan, gray, and black surfaces predominated.

Decoration occurred on 36.9% of all rim sherds within the Potomac Creek Cord-Marked subcategory. Techniques used included incising, punctuation, and cord and cord wrapped dowel impressions. These techniques and related data are discussed more thoroughly in the following decorative analysis discussion.

Potomac Creek Plain (Smoothed). This group includes 413 sherds and is primarily distinguished by its surface treatment. All of the ceramics in this category had smoothed surfaces (Figure 23b–g). In some cases roughened areas which probably represent residual cord marking are visible. Examples of sand, sand and grit, grit, or crushed/angular grit temper were present. Vessel paste was always hard and compact, often including fine micaceous sand. A wide range of sherd colors occurred; however, tan, gray, and black surfaces predominated.

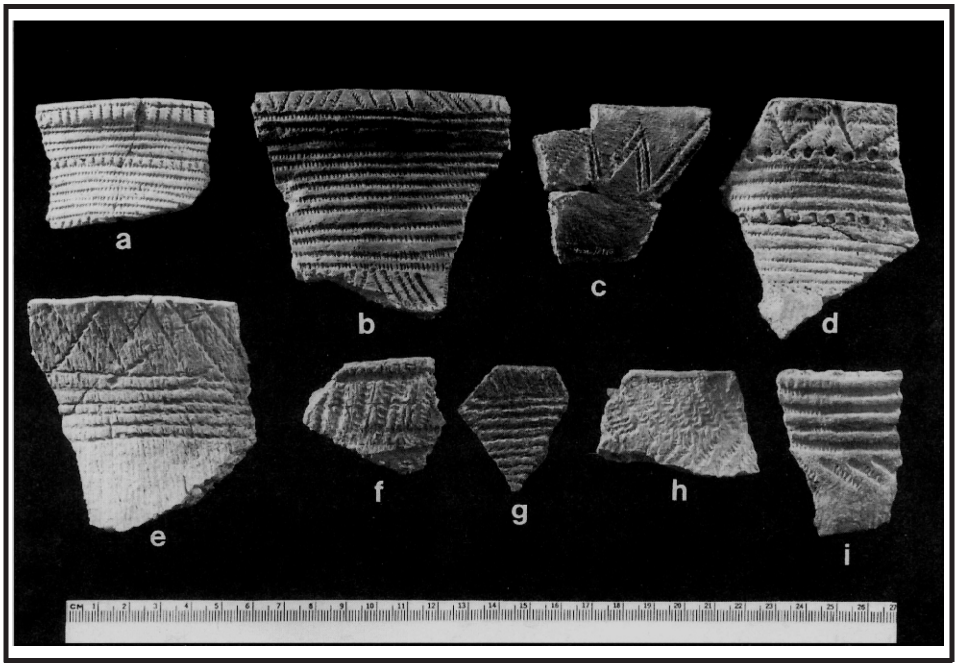


Figure 20. Site 44ST2, decorated Potomac Creek ceramics (a - cord-wrapped-dowel-impressed, simple design [F.26 N½]; b - cord-wrapped-dowel-impressed, complex design [F.1/I]; c - cord-wrapped-dowel-impressed, simple design, interior [F.1/G]; d - cord-wrapped-dowel-impressed, punctate, complex combination [F.1/K]; e - cord-impressed, complex design [F.1/G]; f - cord-wrapped dowel impressed, simple design [F.17 N½]; g - cord-impressed, simple design [F.12 E½]; h - cord-wrapped-dowel-impressed, simple design [F.1/G]; i - cord-wrapped-dowel-impressed, simple design [F.1/B]).

Surface Treatment	Sand	Sand and Grit	Grit	Angular/ Crushed Grit	No Temper	Total
Cord-marked	48	690	504	43	6	1291
Smoothed	18	235	152	8	3	416
Plain	14	21	5	9	51	100
Total	**80**	**946**	**661**	**60**	**60**	**1807**

Table 12. Site 44ST2, surface treatment and temper for Potomac Creek ware.

Decoration occurred on 25% of all rim sherds within the Potomac Creek Plain subcategory. Techniques used included incising, and cord and cord wrapped dowel impressions.

It is important to note that examination of this collection has indicated that the majority of smoothed sherds are either basal or neck/rim fragments. It appears that many cord-marked vessels had smoothed bases and neck/rim areas. This indicates that many of the sherds in this category may be misclassified and actually belong to the cord-marked type. Temper and paste qualities of Potomac Creek Cord-Marked and Potomac Creek Plain have the same range, further strengthening this correlation.

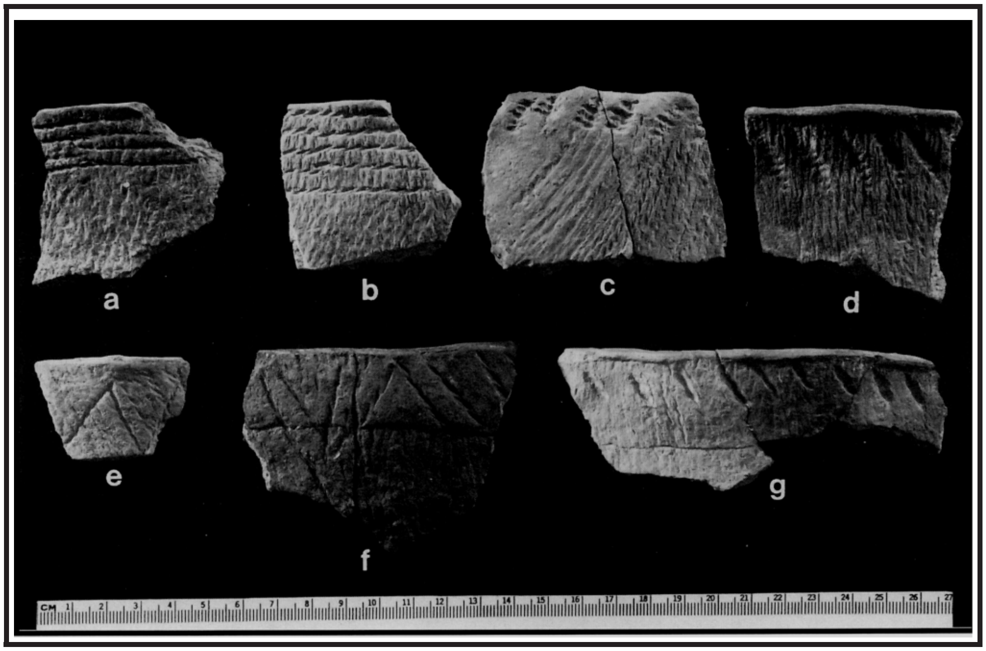


Figure 21. Site 44ST2, decorated Potomac Creek ceramics (a - cord-impressed, horizontal motif [F.1/M]; b - cord-impressed, horizontal motif [F.1/K]; c - cord-wrapped-dowel-impressed, diagonals top right [F.1/K]; d - cord-wrapped-dowel-impressed, diagonals top left [F.12A W½]; e - cord-impressed, simple design [F.1/B]; f - cord-impressed, simple design [F.1/L]; g - cord-wrapped-dowel-impressed, diagonals top left, applied strip [F.1/I/L]).

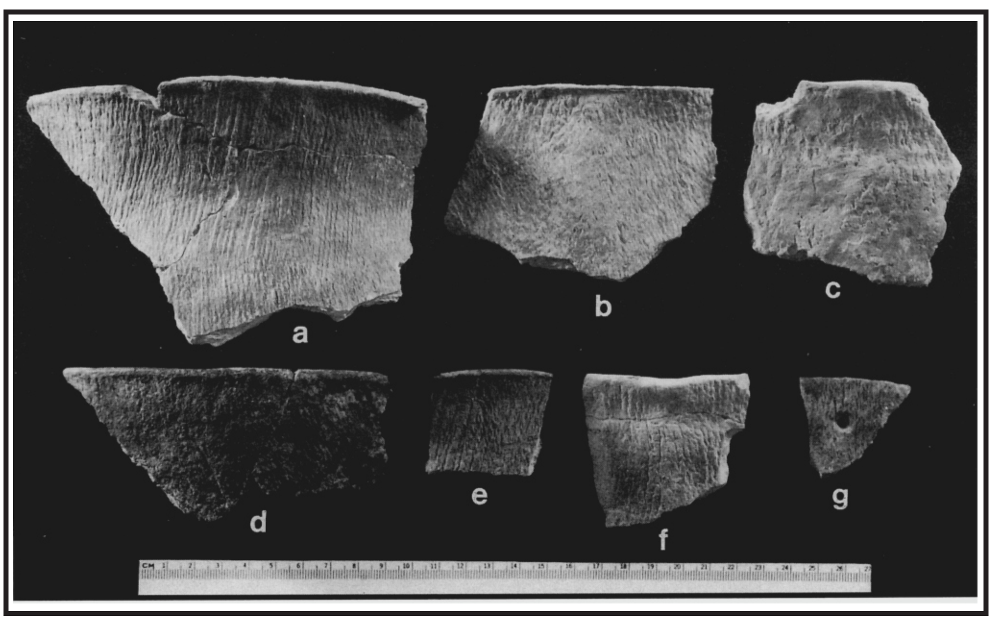


Figure 22. Site 44ST2, Potomac Creek Cord-Marked ceramics (a - F.1/E; b - F.1/H; c - F.1/G; d - F.1/F/G; e - F.1/G; f - F.1/C; g - F.1/E).

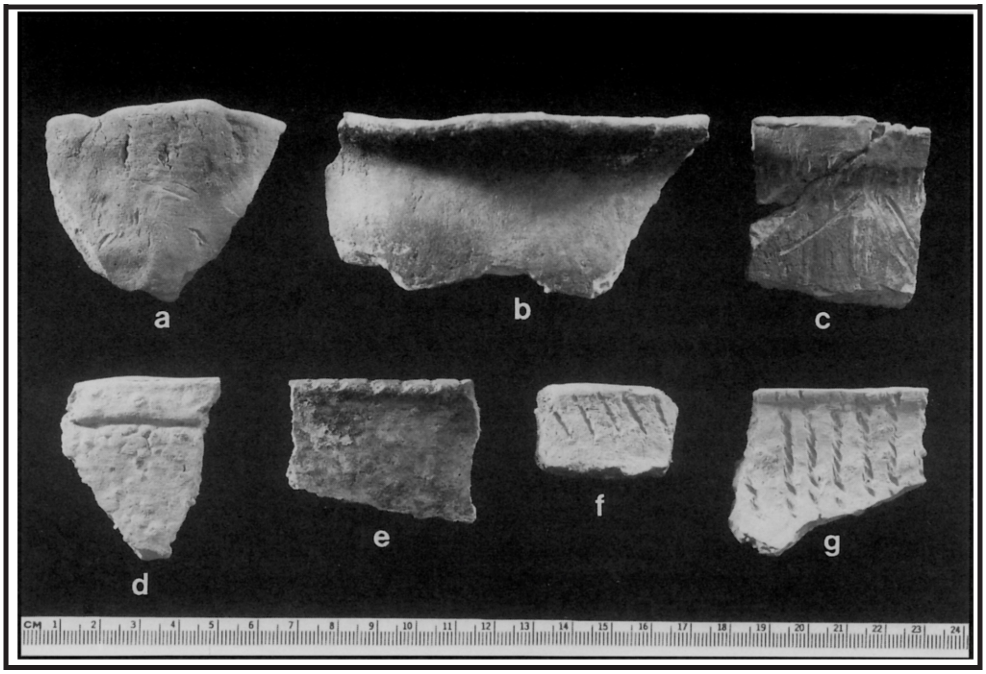


Figure 23. Site 44ST2, Potomac Creek ceramics (a - untyped Potomac Creek [F.1/C]; b - untyped Potomac Creek [F.1/H]; c - Potomac Creek Plain, incised [F.1/J]; d - Potomac Creek Plain, applied strip [F.1/F]; e - Potomac Creek Plain, cord-impressed lip [F.1/H]; f - Potomac Creek Plain, cord-impressed, diagonals top left [F.17 S½]; g - Potomac Creek Plain, cord-impressed, vertical motif [F.5/cleanup]).

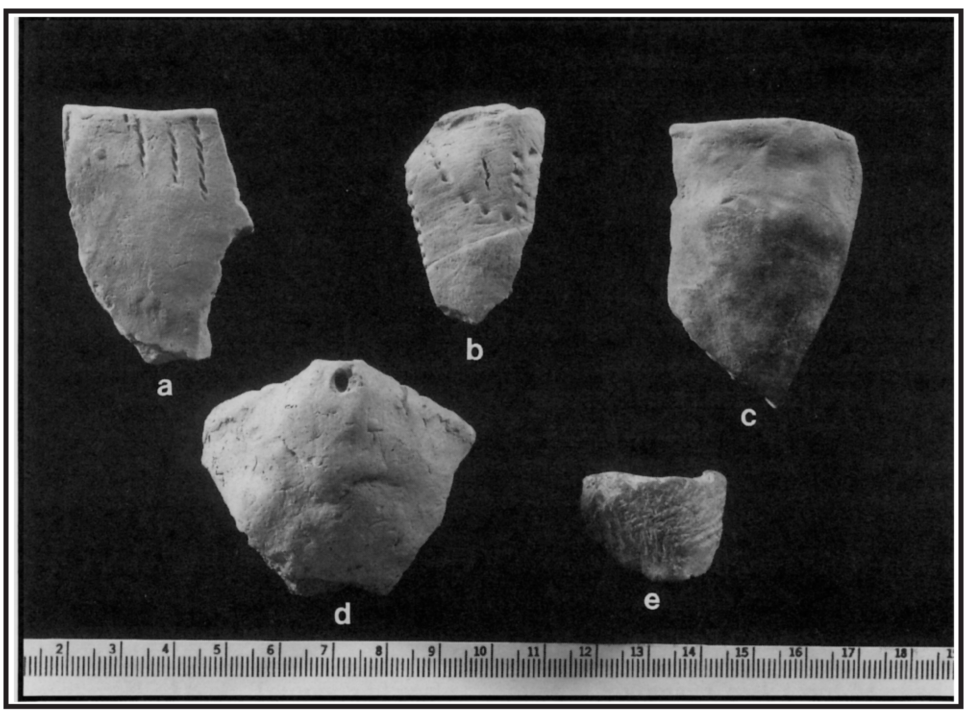


Figure 24. Site 44ST2, Potomac Creek Sand-Tempered (Moyaone) ceramics (a - cord-impressed, vertical motif [F.1/H]; b - punctate, simple design [F.1/E]; c - undecorated [F. 12 E½]; d - undecorated [F.1/H]; e - cord-marked [F.1/H]).

A small number of Potomac Creek basal fragments from Feature 1 seemed to contain more organic inclusions and/or organic impressions on their surfaces than any of the recovered rim or body sherds. This may be indicative of differential manufacturing processes for the lower portion of the vessel, perhaps the modeling of these fragments on a grassy surface. Basal fragments were also more often smoothed than other vessel portions, and it is possible than reeds or grasses were used during this process.

Potomac Creek Sand-Tempered (Moyaone). This group includes 60 sherds and is primarily distinguished by its lack of temper (Figure 24). All sherds assigned to this group are believed to be untempered; however, their paste, which was always fairly hard and compact, usually includes a very fine micaceous sand. This sand, also observed in sherds representing other Potomac Creek subcategories, appears to be a component of the original clay source and not an intentionally added tempering agent. Surface treatments found within this subcategory are predominantly plain (85%). A few sherds had surfaces identified as either smoothed (5%) or cord-marked (10%). The majority of these sherds were from small or "miniature" vessels (Figure 25). Sherd color ranged from tan to gray; unlike the other Potomac Creek categories, no blackened surfaces were present.

Decoration occurred on 16.7% of all rim sherds within the Potomac Sand-Tempered subcategory. Techniques used included incising, and cord impressions.

Potomac Creek Sand-Tempered was defined by Karl Schmitt based on sherds from 44ST2. Later Stephenson et al. (1963) suggested that these ceramics be given their own ware group named Moyaone. This ware was distinguished by fine sand temper. Both incised and cord impressed decorations were noted (Stephenson et al. 1963:120–125).

Miscellaneous/Untyped Potomac Creek. The 49 sherds in this group could not be assigned to any of the other categories due to variation in surface treatment, temper, and paste (see Figure 23a, b). Examples of sand, sand and grit, grit, or crushed/angular grit temper were present. Reexamination of these sherds has indicated that most are probably variants of the other three Potomac Creek subcategories.

Decoration occurred on 76.5% of all rim sherds within this subcategory. Techniques used were cord wrapped dowel and cord impressions.

Minority Types

These sherds constitute only 4.1% (n=78) of the Late Woodland assemblage. This small proportion may indicate that these sherds represent trade wares or are from other ephemeral occupations. All of the types are generally contemporaneous with Potomac Creek ware, but are associated with different cultural and geographic areas. The high proportion of Potomac Creek ware at 44ST2 indicates that it was the locally manufactured ceramic during the majority of the Late Woodland period. Therefore, the trade hypothesis may be the most probable explanation for the occurrence of the minority wares.

Townsend Ware. This shell-tempered, fabric-impressed ware is common throughout Virginia's Coastal Plain (Egloff and Potter 1982:107, 109). It was first described by Blaker (1963), and later refined by Griffith into four types: Rappahannock Fabric-Impressed, Rappahannock Incised, Townsend Corded, and Townsend Herringbone (Blaker 1963:14–22; Griffith 1980). These types have been defined by the presence, absence, or kind of decoration applied to the ware (Griffith 1980). All types of Townsend Ware were impressed with a relatively fine weave wicker fabric (Egloff and Potter 1982:107; Mouer et al. 1992:99). The vessels are usually coil-constructed, wide-mouth jars of varying size with direct rims, conoidal bodies, and rounded or

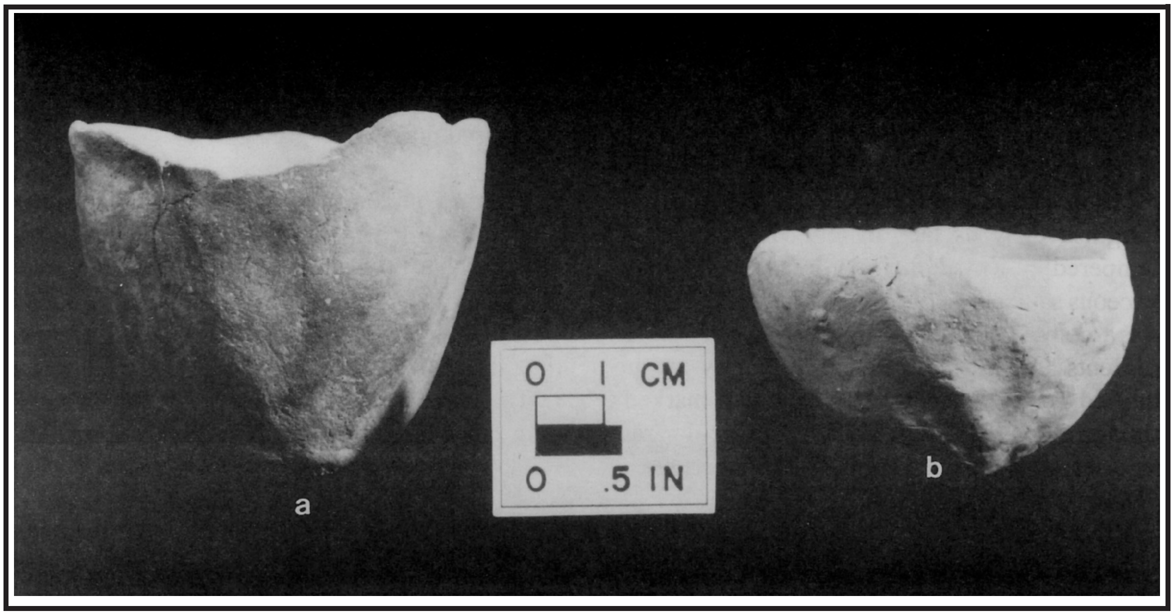


Figure 25. Site 44ST2, Potomac Creek Sand-Tempered (Moyaone) vessels (a - Plain, undecorated, miniature jar [F.1/E]; b - Plain, undecorated, miniature bowl [F.1/E]).

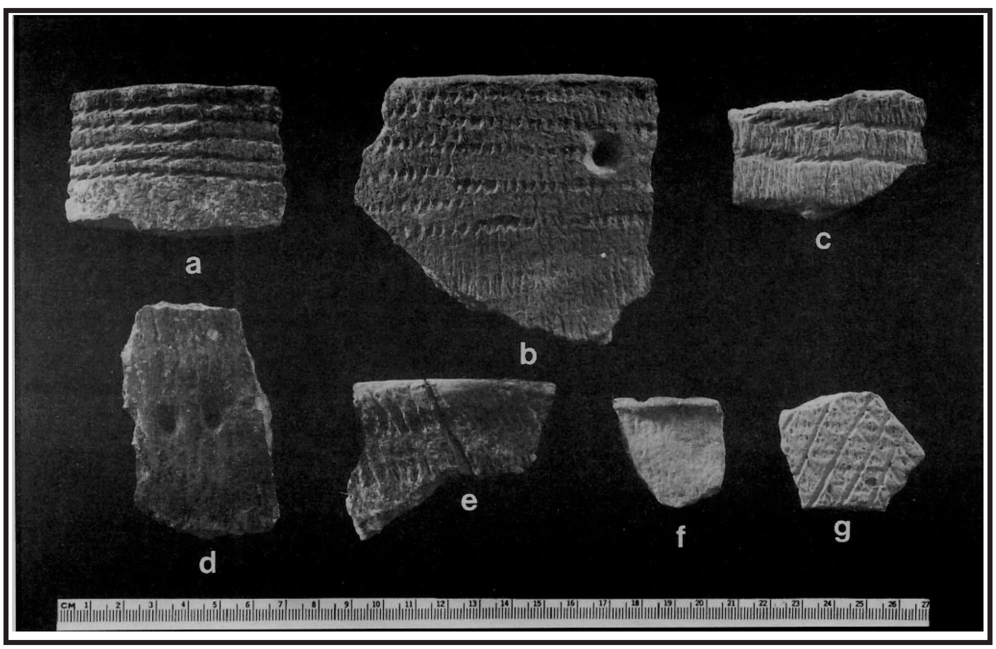


Figure 26. Site 44ST2, minority ceramics (a - Late Woodland micaceous sand-tempered, cord-marked, cord-impressed, horizontal motif [F.1/I]; b - Late Woodland micaceous sand-tempered, cord-marked, cord-wrapped-dowel-impressed, horizontal motif [F.15 W½]; c - Late Woodland, cord-marked, cord-impressed, horizontal motif [F.1/I]; d - Keyser Cord-Marked, punctate [F.1/E]; e - Page Cord-Marked [F.1/I/H]; f - Keyser Cord-Marked, notched lip [F.1/A]; g - Townsend Ware, Rappahannock Incised, simple design [F1/K]).

semiconical bases (Egloff and Potter 1982:107). Townsend ware generally dates from AD 900 into the early 1500s (Egloff and Potter 1982:107). Townsend is also frequent in Maryland and in North Carolina, where it is classified within the Colington series (Eastman and Lautzenheiser 1993:5).

Nineteen Townsend sherds were included in the 44ST2 sample, all of which conform to the traditional suite of expected traits. All are impressed with a fine-weave wicker fabric and have thin walls and a compact, well-fired paste. Two sherds with cross-hatched incised decoration representing the Rappahannock Incised type of this ware are present within the sample (Figure 26g). The remainder are of the Rappahannock Fabric-Impressed type. In most cases, the interiors of sherds have been well smoothed. All of the Townsend sherds have moderate amounts of medium to fine crushed shell temper and a compact well-fired paste.

Keyser Cord-Marked. This ware was first identified based on collections from a site in Page County, Virginia. It is shell-tempered with predominantly cord-marked exterior surfaces. Vessels usually have vertical to slightly flared rims, and often have loop handles or "pseudo-lugs" (Egloff and Hodges 1989). Decoration includes punctation, incising, and cord marking. It is a common occurrence on Late Woodland/Contact period sites in the Potomac Valley west on the Fall Line (Stewart 1992:51). Keyser may be associated with the Monongahela culture of western Pennsylvania (Egloff and Hodges 1989). Related sherds were reported at Maryland's Accokeek Creek Site (Stephenson et al. 1963:129).

Eleven sherds related to this type were identified at 44ST2 (see Figure 26d, f). All are cord-marked and shell-tempered with a hard, compact paste, and relatively thin vessel walls. Identified decoration is confined to one rim sherd with a scalloped lip and one sherd exhibiting wide oblong punctations near the vessel shoulder. In addition, five shell-tempered sherds with smoothed exterior surfaces were identified within the 44ST2 sample and may be associated with this category.

Page Cord-Marked. This limestone-tempered ware has predominantly cord-marked exterior surfaces (see Figure 26e). Vessels have vertical to slightly flared rims, often with attached collars (Egloff and Hodges 1989). Like Potomac Creek and Keyser Cord-Marked varieties, decoration includes punctation, incising, and cord-marking. Page Cord-Marked is a Late Woodland type (Egloff and Hodges 1989). This ceramic type has often been associated with the Radford series of southwestern Virginia; however, recent research indicates that it may be more correctly linked to the Shepard series with a more northern distribution range (Egloff and Hodges 1989). Similar sherds were identified at the Accokeek Creek Site (Stephenson et al. 1963:129).

Nineteen cord-marked and limestone-tempered sherds in the collection are attributed to this ware. All have a compact well fired paste. The sample includes examples with applied collars and horizontal cord impression. An additional eight limestone-tempered sherds with smoothed surfaces are included in the assemblage and may also be related to this type.

Gaston Ware. Gaston was first described as a simple-stamped ware with angular to subangular quartz temper in a clayey paste (Coe 1964:105–106). A common type in the Fall Zone area to the south of 44ST2, Gaston vessels are often globular in form with straight to excurvate rims (Egloff and Potter 1982:109). Vessel bases are usually round to flat, although conical variants do occur (Coe 1964:106). Decoration includes incising, punctations, or finger pinching below the rim. Lips of Gaston vessels are often flattened with a grooved paddle leaving behind a stamped impression, or they are notched at regular intervals with a paddle edge or other tool (Coe 1964:105–106). Gaston is believed to be representative of the terminal Late Woodland and protohistoric periods (AD 1200 to post-1700) (Egloff 1989:45). Recent research in the Hopewell/Prince George area has indicated that Gaston sherds may display greater variation in paste and temper than was allowed by the original parameters set in 1964 (Mouer et al. 1992:95–96).

Feature No.	Direct	Thickened	Applied Strip	N/A	Total
1	122	9	6	27	164
3	1	–	–	–	1
5	4	1	–	–	5
7	1	–	–	–	1
9	–	–	–	1	1
10	–	–	–	1	1
11	1	–	–	–	1
12	9	–	1	2	12
15	12	–	–	5	17
17	6	–	–	–	6
25	2	–	–	–	2
26	–	1	–	–	1
Total	**158**	**11**	**7**	**36**	**212**

Table 13. Site 44ST2, rim construction for all vessels.

One simple-stamped, sand- and grit-tempered sherd was identified within the 44ST2 sample. It has a hard compact paste, and is well fired. This sherd was recovered from Feature 6/7, Section F, and is believed to be Gaston.

Unidentified Late Woodland Micaceous Sand-Tempered. Fourteen sherds with micaceous sand temper were included in the 44ST2 sample (see Figure 26a, b). This tempering agent was primarily composed of medium to large flakes of golden mica in combination with a medium-grained sand. In some cases, small amounts of grit were also present. Cord-marked, smoothed, and plain surface treatments were identified. All sherd interiors were either smoothed or scraped. The paste of these sherds was hard and compact. Decoration includes cord and cord wrapped dowel impressions. Characteristics such as surface treatment, decoration, and paste indicate a Late Woodland origin for these sherds. Although consistently thicker in profile, decorative motifs, techniques, and surface treatment on these sherds share traits with some Potomac Creek wares and hint at a possible, as yet unidentified, relationship between the two wares.

DECORATION ANALYSIS

Once the standardized inventory of the 44ST2 collection was complete other analyses were conducted. All rim sherds >2.5 cm (n=214) and complete vessels (n=2) were included in these studies along with other diagnostic (decorated) fragments (n=36). Most of the decorated sherds found within the collection that were not rims, appear to be neck fragments. These rims, vessels, and decorated sherds were identified as having originated from at least 212 separate vessels. Ninety-nine of the rims did not have decoration on their exterior surfaces. Standardized information compiled during the analysis was introduced into a database format to facilitate interpretation. Attributes examined included rim and lip type, exterior decoration techniques, and motifs.

Rim Type

The first attribute group examined was rim type. Categories used were direct, thickened, and applied strip (Table 13). The majority of the rims examined in this study were direct (89.3%). Direct rims are basic, and not structurally embellished after their original formation (see Figure 21c). The remaining 10.7% are divided between thickened (6.2%) (see Figure 20f) and applied strip (4.5%) (see Figure 21f, g). Thickened rims had extra clay added, usually in the form of a small coil or half a coil adjacent to the lip. In some cases thickening may have been accomplished by folding. Applied strip refers to the application of a thin strip of clay, usually at least 1.5 to 2 cm in width along the vessel rim adjacent to the lip. Often the edges of this strip were visible on the exterior surface of the vessel as well as within the vessel profile. Thirty-six of the decorated sherds were not rims and, therefore, not applicable in this category.

Lip Type

Another trait group is lip type. It was divided into four basic types. *Rounded* lips were obviously rounded or rolled in order to create a smooth, well-defined arc. *Stamped* lips were flattened or stamped by the application of pressure with a cord-wrapped paddle or other textured tool (possibly a cord-wrapped dowel). *Flattened* lips were compressed by pressure from a non-textured tool or may have been flattened by stamping and then smoothed The term *simple* was used to identify lips that were not modified after construction by any of the above techniques. Two vessels had unidentifiable lip types due to erosion. In addition, 36 of the decorated sherds were not rims and, therefore, not applicable in this category.

Rounded lips were least common of the types (15.3%), followed closely by the simple category (18.2%). Stamped (31.3%) and flattened (34.1%) lips had a similar frequency within sample. When examined in conjunction with rim construction it is interesting to note that flattened lips were frequently associated with applied strip (71.4%) and thickened (72.7%) rims. Stamped lips were most often found with direct rims (34.3%). It is important to note that flattened lips with direct rims were almost as common (29.9%).

Exterior Decoration

Four primary exterior decoration techniques were identified within the sample. The first, *cord impression*, is defined as individual pieces of cord applied independently on the vessel body (see Figure 20e, g; 21a, b, e, f). The *cord-wrapped dowel* technique uses a dowel or other rounded object wrapped with a cord to impress the vessel surface (see Figure 20a–d, f, h, I). Because it is often difficult to distinguish between techniques such as cord-wrapped dowel, cord-wrapped paddle-edge impressions, and impressions that have been described as “pseudo cord” (Stewart 1992), this analysis groups all these techniques together under the heading of cord wrapped dowel impression. *Incising* consists of the inscribing of the vessel wall with a sharp, usually pointed, tool, possibly made of wood or bone (see Figure 23c). Within this assemblage, incised patterns seemed to imitate cord-impressed designs. *Punctation* consists of the impression on the vessel surface of a circular tool, possibly a reed or a stick (see Figure 20d). Both hollow and solid punctations occur within the assemblage.

Cord (24.9%) and cord-wrapped dowel (20.7%) impressions were the most often observed decorative techniques within the 44ST2 assemblage (Table 14). Combinations of decorative techniques were rare, but did occur. The most common was cord-wrapped dowel with punctation. Incising and punctuation were never observed on the same sherd. Ninety-nine (46.5%) of the vessels examined did not have decoration on their exterior surfaces.

Decorative Motifs

Eight different motif groups were created to encompass the variation found within the 44ST2 sample *Horizontal* motif is defined as lines applied horizontally below the vessel lip using only one decorative technique (see Figure 21a, b). *Vertical* motif is defined as lines impressed vertically below the vessel lip using one decorative technique (see Figure 23g). *Diagonals (top left)* consists of lines applied diagonally

Feature No.	Cord-Impressed	Cord-Wrapped Dowel	Incised	Cord-Impressed/ Incised	Punctate	Punctate/ Cord-Wrapped Dowel	Undecorated	Total
1	39	31	4	1	4	3	82	164
3	1	–	–	–	–	–	–	1
5	2	1	–	–	–	–	2	5
7	–	–	–	–	–	–	1	1
9	–	–	–	–	–	1	–	1
10	–	1	–	–	–	–	–	1
11	1	–	–	–	–	–	–	1
12	3	5	–	–	–	–	4	12
15	7	2	1	–	1	1	6	18
17	–	3	–	–	–	–	3	6
25	–	1	–	–	–	–	1	2
26	–	–	–	–	–	1	–	1
Total	**53**	**44**	**5**	**1**	**5**	**6**	**99**	**212**

Table 14. Site 44ST2, exterior decoration for all vessels.

below the vessel lip with the left edge of the diagonal closest to the rim (see Figure 21d, g). *Diagonals (top right)* consists of lines applied diagonally below the vessel lip with the right edge of the diagonal closest to the rim (see Figure 21e). *Simple designs* exhibit lines created using the same technique occurring in two separate directions. These lines are most often perpendicular to one another, creating a cross-hatched pattern, or are the components of a zig-zag line (see Figure 20a, c, f, g–I). *Complex designs* have lines that occur in more than two directions, but which were produced using the same decorative technique (see Figure 20b, e). *Simple combinations* consist of lines occurring in only one or two directions, but produced using more than one decorative technique. *Complex combinations* have lines occurring in more than two directions, created using more than one decorative technique (see Figure 20d).

The most common motifs found within the assemblage were horizontal, vertical, and diagonal impressions below the vessel rim (Table 15). These motifs accounted for 71.9% of all the decorated vessels identified. Note that the majority of the diagonal impressions were top left (87%). The most common geometric designs within the assemblage were simple with lines only occurring in two directions (15.8 %). More complex designs occurred on 4.4% of the decorated vessels. Combinations of decorative techniques, forming both simple and complex designs accounted for 6.1% of the decorated sample.

Summary

Decoration of the sherds from 44ST2 is confined to the rim and neck portion of vessels. The majority of the decoration is the result of cord or cord-wrapped dowel impressions applied horizontally, diagonally, or vertically to the vessel rim. The cords are usually deeply impressed and range in thickness from thin to heavy. Of all the vessel rims identified within the >2.5-cm sample, 44.1% were decorated.

When decorative technique and motifs are compared, several important trends may be identified. The majority of vessels decorated with cord impression had the horizontal motif (60.4%). The remaining 39.4% were diagonal top left (15.1%), diagonal top right (3.8%), vertical (6.6%), simple designs (9.4%), complex designs (1.9%), and unidentified (3.8%). Motifs on vessels decorated with the cord-wrapped dowel technique were more variable: 27.3% were horizontal, 25% diagonal top left, 22.7% simple designs, and the remaining

Feature No.	Horizontals	Verticals	Diagonals (Top Left)	Diagonals (Top Right)	Simple Designs	Complex Designs	Simple Combinations	Complex Combinations	Unid.	N/A	Total
1	32	7	15	3	14	4	2	2	3	82	164
3	–	–	1	–	–	–	–	–	–	–	1
5	1	1	–	–	–	1	–	–	–	2	5
7	–	–	–	–	–	–	–	–	–	1	1
9	–	–	–	–	–	–	1	–	–	–	1
10	1	–	–	–	–	–	–	–	–	–	1
11	1	–	–	–	–	–	–	–	–	–	1
12	4	–	2	–	2	–	–	–	–	4	12
15	8	1	1	–	1	–	–	–	–	6	17
17	1	–	1	–	1	–	–	–	–	3	6
25	–	1	–	–	–	–	–	–	–	1	2
26	–	–	–	–	–	–	1	–	–	–	1
Total	**48**	**10**	**20**	**3**	**18**	**5**	**4**	**2**	**3**	**99**	**212**

Unid. = unidentifiable

Table 15. Site 44ST2, decorated vessels motifs.

25% vertical, diagonal top right, and complex designs. This clustering of particular decorative techniques and motifs may indicate particular trends within the Potomac Creek ceramics industry.

ANALYSIS OF CORDAGE TWIST

Data about cordage technology based on impressions in ceramics collected at 44ST2 was compiled by William C. Johnson (Appendix E). Johnson examined a combination of latex casts (approximately 88.1%) and plasticine impressions (approximately 11.9%) taken from samples collected by WMCAR, CRI, and Howard MacCord. The sample derived from MacCord's 1983 test excavations is from the southern edge of the village (Manson and MacCord 1985) and has been discussed by Johnson (1996) in a previous publication.

Sherds were selected that had the most promising surfaces for cord twist detection. Tables summarizing data collected about measurements and twist direction (Z or S) of the cordage used for surface treatment and decorative elements can be found in Appendix E. Analysis of cord twist was based on Maslowski (1973:4–6) and Hurley (1979:5–11). Note that all data about twist direction are based on a positive image (i.e., the direction of twist of the original cord rather than that of the impressed image). The cordage represented in the sample was generally two-ply, meaning that it was composed of two spun elements twisted together in the opposite direction of the initial spin. Two examples each of multiple-ply and replied cord were documented. Measurements compiled of the cordage used in the Potomac Creek ceramics industry include cord diameter, ply diameter, and cord twist angle.

Notably, 96.26% (n=438) of the cordage used in the surface treatment of examined Potomac Creek Cord-Marked sherds was identified as Z-twist. In addition, the majority of cord used to produce decorative elements was also Z-twist (direct cord [includes cord wrapped dowel] 77.97%; pseudo-cord 89.83%; total 83.9%) (see Appendix E Table B). The results show a significant tendency for Z-twist cord use in the manufacture of Potomac Creek ceramics. In contrast, individual sherds of Townsend and Keyser wares examined were both found to be manufactured using S-twist cordage. Differences in twist direction may be attributable to different cordage manufacturing traditions. In the future, examination of a larger sample of the Late Woodland minority wares from 44ST2 may confirm this important distinction among temporally similar ceramic types from the site. In addition, comparison of sherds from 44ST2 with other Late Woodland assemblages may help to refine cultural distinctions between the manufacturers of Potomac Creek and other Late Woodland ceramic wares.

VESSEL FORM ANALYSIS

Of the 212 vessels identified within the ceramic sample, 178 had identifiable vessel forms. The main categories recognized are beaker, bowl, jar, miniature bowl, miniature jar, and miniature vessel. For comparative purposes, all miniature vessels are grouped together in the following discussion.

The majority of the vessels are jars (82.6%). The two other categories of standard-sized vessel forms, beakers (2.8%) and bowls (6.7%), were much less common. Miniature vessels (7.8%) were also present, the majority of which are believed to be miniature jars.

Jars have everted, slightly everted, and straight rims (Figure 27 and 28). Most have slightly constricted to constricted necks, with well-defined shoulders. The generalized overall form of jars is globular. Beakers are conical in form with straight sides and rims, and unconstricted necks. Bowls within the assemblage tend to have everted rims, although a few are straight. Most of the bowls seem to be relatively shallow, with their

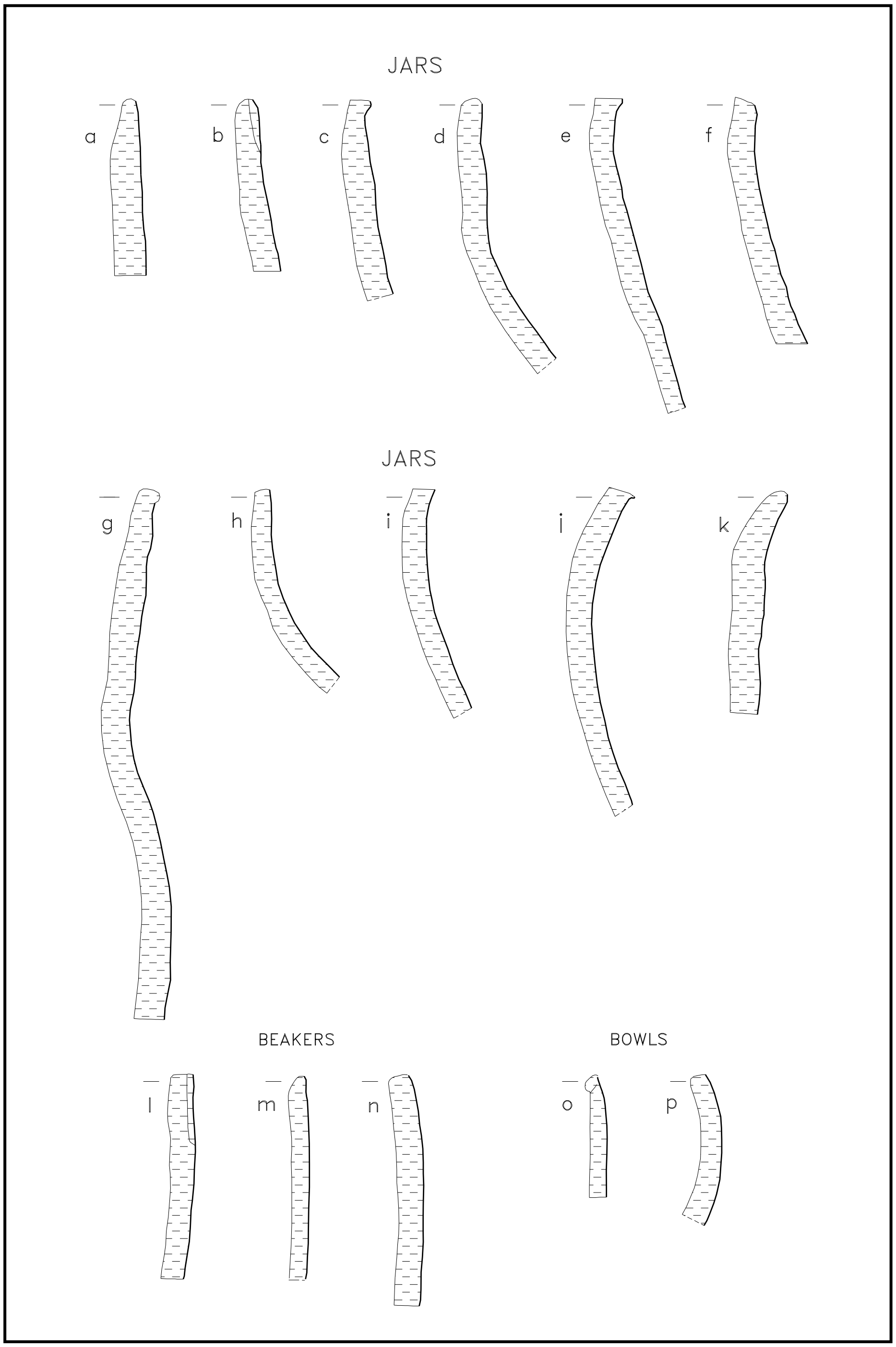


Figure 27. Rim profiles of Potomac Creek Cord-Marked vessels (a–k - jars [a - see Figure 21c; c - see Figure 21d; e - see Figure 22b; I - see Figure 20e; j - see Figure 22a; k - see Figure 22c]; l–n - beakers [l - see Figure 21f]; o–p - bowls).

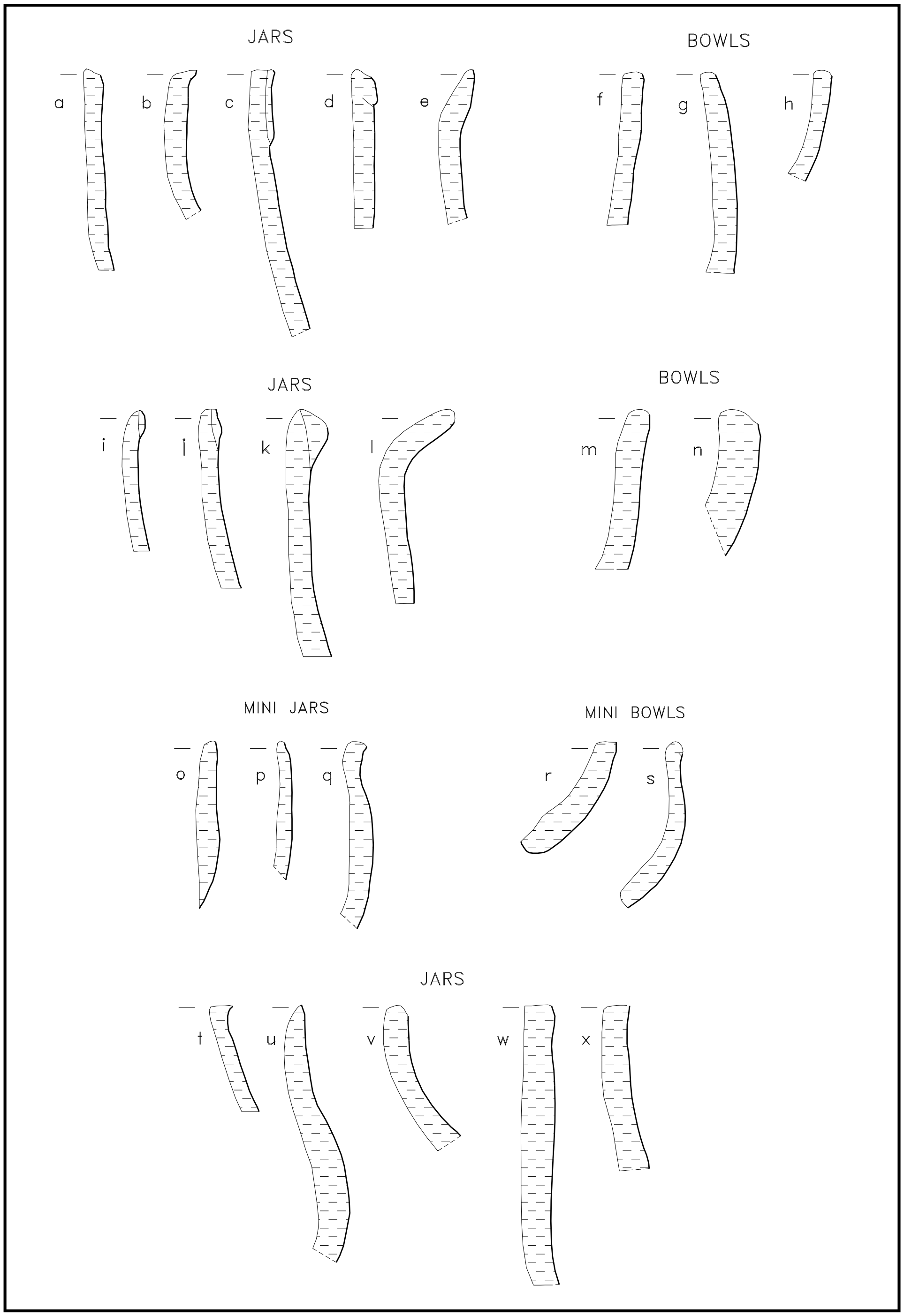


Figure 28. Rim profiles of Potomac Creek Plain, miscellaneous Potomac Creek, Potomac Creek Sand-Tempered, and minority ware vessels (a–e - Potomac Creek Plain jars [b - see Figure 23g; d - see Figure 23d; e - see Figure 23c]; f–h - Potomac Creek Plain bowls; i–l - miscellaneous Potomac Creek jars [i - see Figure 20a; j - see Figure 20c; k - see Figure 20b; l - see Figure 23b]; m–n - Potomac Creek Sand-Tempered bowls [n - see Figure 23a]; o–q - Potomac Creek Sand-Tempered mini jars [o - see Figure 24a; p - see Figure 24b; q - see Figure 24c]; r–s - Potomac Creek Sand-Tempered mini bowls; t–u Keyser jars [t - see Figure 26f]; v - Page jar [see Figure 26e]; w–x - Late Woodland micaceous sand-tempered jars [w - see Figure 26b; x - see Figure 26a]).

greatest circumference at their orifices. Among the miniature vessels, both bowl and jar forms are evident, and often seem to mimic the larger vessels. Rims are everted to straight, with both deep jar and shallow bowl examples of this range. Included in the miniature vessel category are two complete examples: one bowl and one jar recovered from Feature 1, Section E (see Figure 25).

Although miscellaneous basal fragments were not part of the vessel form analysis, the following general observations were made. Most bases are rounded to semi-conical in form, most appearing to be from globular-shaped vessels. A small number of bases are flat. Variation in vessel size is apparent, an observation reinforced by rim diameter measurements discussed below. As is common to most prehistoric ceramics, vessel wall thickness is greater in basal fragments than in body and rim sherds; however, this difference is not as pronounced as is often found in Late Woodland assemblages. Size differentiation made the basal fragments of miniature vessels easy to identify. None of the miniature examples were flat, all appeared rounded to semi-conical. The majority of basal fragments identified showed evidence of smoothing on their exterior surfaces. In addition many had striated abrasions and slightly battered areas that may be attributed to use wear, perhaps specifically to the use of stone or other material to prop up vessels with rounded or conical bottoms.

If vessel type is sorted by surface treatment, it is quickly evident that the cord-marked, smoothed, and plain categories are all dominated by jars, and include much smaller numbers of beakers and bowls (Table 16). Initially, this seems to indicate that all three types of surface treatment have a similar range with regard to the standard vessel forms. However, when each form is examined separately, it becomes apparent that although the jar and beaker categories are primarily cord-marked, the bowl group has predominantly smoothed and plain surfaces (see Table 16). All of the miniature vessels have plain surfaces, creating a group distinct from jars and beakers. Also included in the assemblage was one fabric-impressed jar.

Temper also establishes several distinctions between vessel forms. Jars have the widest range of temper variation, encompassing all of the identified categories; however, they also make up the majority of the sample (Table 17). Sand and grit is the most common temper in jars, followed closely by grit. Angular/crushed grit, micaceous sand, limestone, and shell temper were only identified within the jar category. All beakers were either grit- or sand- and grit-tempered. Half of the bowls were tempered with sand and grit, and the rest were untempered or contained a small amount of fine sand. The majority of miniature vessels were also untempered. This reinforces the link between bowls and the miniature vessels previously suggested by the commonality of plain surfaces.

Rim diameters of vessel forms establish general size parameters for each category. Jars have the greatest range in size (11 to 41 cm) with a mean measurement of 23.7 cm (Figure 29). The mean for bowls was 18.3 cm and 23 cm for beakers. Bowls were the smallest of the standard forms. Due to their overall size, miniature vessels are easily distinguished by their rim diameters. The mean diameter of all the miniature vessels was 6.5 cm, with none greater than 9 cm.

The examination of rim diameter in relation to surface treatment indicates that cord-marked (mean = 24.1) and smoothed (mean = 23 cm) surface treatments have a roughly similar size range (Table 18). However, both larger and smaller examples occur within the cord-marked category. Sherds with plain surface treatments have a smaller mean rim diameter (15.3 cm).This smaller average is due to the inclusion of all miniature vessels within this category, as well as many of the bowls that also have a small average rim diameter. One anomalous inclusion in the plain group has a rim diameter of 41 cm and is the largest vessel in the assemblage.

Vessel Form	Cord-Marked	Smoothed	Plain	Fabric-Impressed	Unidentifiable	Total
Beaker	3	1	1	–	–	5
Bowl	4	2	6	–	–	12
Jar	104	21	15	1	6	147
Miniature bowl	–	–	3	–	–	3
Miniature jar	–	–	8	–	–	8
Miniature vessel	–	–	3	–	–	3
Unidentifiable	21	5	1	1	6	34
Total	**132**	**29**	**37**	**2**	**12**	**212**

Table 16. Site 44ST2, surface treatment by vessel form.

Vessel Form	Sand	Sand and Grit	Grit	Angular/ Crushed Grit	Micaceous Sand	Limestone	Shell	No Temper	Total
Beaker	–	3	2	–	–	–	–	–	5
Bowl	1	6	–	–	–	–	–	5	12
Jar	6	79	42	9	4	2	4	1	147
Miniature bowl	–	2	–	–	–	–	–	1	3
Miniature jar	–	1	–	–	–	–	–	7	8
Miniature vessel	–	–	–	–	–	–	–	3	3
Unidentifiable	2	14	14	2	1	–	1	–	34
Total	**9**	**105**	**58**	**11**	**5**	**2**	**5**	**17**	**212**

Table 17. Site 44ST2, temper by vessel form.

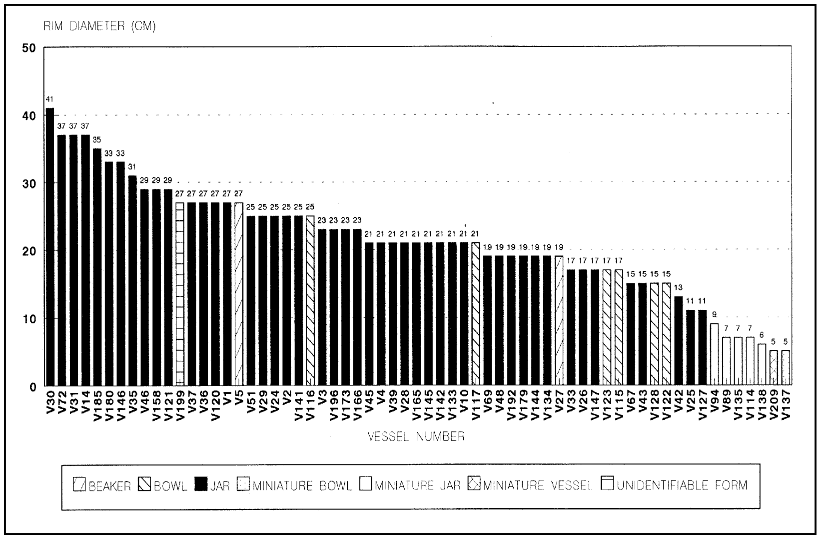


Figure 29. Site 44ST2, rim diameters of vessels >5 cm by form.

Rim Diameter	**Cord-Marked**	**Smoothed**	**Plain**	**Unidentifiable**	**Total**
5	–	–	2	–	2
6	–	–	1	–	1
7	–	–	3	–	3
9	–	–	1	–	1
11	1	–	1	–	2
13	1	–	–	–	1
15	2	1	1	–	4
17	1	–	3	1	5
19	4	1	2	–	7
21	8	2	–	–	10
23	3	–	1	–	4
25	2	2	2	–	6
27	5	1	–	–	6
29	3	–	–	–	3
31	–	1	–	–	1
33	2	–	–	–	2
35	1	–	–	–	1
37	3	–	–	–	3
41	–	–	1	–	1
Total	**36**	**8**	**18**	**1**	**63**

Table 18. Site 44ST2, surface treatment by rim diameter (rims >5 cm).

When vessel form data are examined in conjunction with typological distinctions, the following may be noted. Potomac Creek Cord-Marked is dominated by jars, although beaker and bowl forms are also recognized. This group, which makes up the majority of the sample, has the greatest variation in rim profiles and in decoration (see Figure 27). The majority of Potomac Creek Plain (smoothed) vessels are also jars, with smaller numbers of beakers and bowls completing the sample (see Figure 28). This category may be more standardized than the cord-marked group. Most of the bowls identified within the 44ST2 assemblage are Potomac Creek Plain or Potomac Creek Sand-Tempered. All of the miniature vessels in the assemblage were categorized as Potomac Creek Sand-Tempered, and in addition many of the standard-sized bowls may also be related to this group. The link between miniature vessels and plain untempered bowls is further reinforced by evidence that similar manufacturing techniques (such as finger pinching and hand modeling) were used to produce both types.

SURFACE RESIDUE ON CERAMIC VESSELS

Numerous sherds in the assemblage had residue on them. In this analysis, only residue on rim and decorated sherds was quantified. Of the 212 individual vessels identified, 141 (66.5%) had traces of residue on them (Table 19). Carbonized residues are often primary evidence in functional studies, allowing determination of whether or not a vessel was used over a fire and, therefore, presumably for cooking. Residue on vessels in this assemblage, which is black and flaky, is believed to be representative of either charred food remains or most likely the accumulation of soot from an open fire.

Jars most often (80.1%, n=113) have residue, and 76.9% of all jars identified are included in this group (see Table 19). This indicates that jars were a primary form for cooking vessels. Beakers also seem to have been used for cooking as 80% (n=4) of identified beakers had residue on them. Residue was less common on bowls, occurring on only 41.7% (n=5) of all those identified. This indicates that bowls were used most often as storage or serving vessels rather than for cooking. None of the miniature vessels had residue or other indications of heating after initial firing.

Although residue was present on both interior and exterior vessel surfaces, the majority was identified on exteriors (58.2%, n=82) (see Table 19). Most of the exterior residue is believed to be consistent with sooting resulting from placement over an open fire. Only two vessels, both jars, were identified with residue exclusively on their interior surfaces. Residue was identified on both the interior and exterior surfaces of 26.9% (n=57) of all stained vessels. When residue was identified on both the interior and exterior surfaces, the interior residue was often located near the lip. Residue on vessel exteriors was also often concentrated near vessel lips, although it was usually also present on many of the remaining exterior surfaces. Most of the exterior residue is believed to be sooting resulting from placement of vessels over an open fire.

Many of the vessels recovered from 44ST2 may be viable candidates for chemical analysis designed to identify the specific type of residue found on their surface. In addition, several have coatings thick enough that radiocarbon dating could be possible. Such studies may be able to expand and refine data gleaned from current zooarchaeological and paleobotantical studies. Caution should be taken however, given that most vessels probably had multiple contents and were employed in multiple episodes of food preparation. The residue on any given vessel is unlikely to represent one individual cooking episode.

PIPES

Fifty-one pipe fragments were recovered from 44ST2 (Figure 30). These fragments can be divided into two distinct categories. Pipes in one category have a tapered stem, a small bore diameter, and are never

Vessel Form	Interior	Exterior	Interior & Exterior	None	Total
Beaker	–	2	2	1	5
Bowl	–	4	1	7	12
Jar	2	73	38	34	147
Miniature Bowl	–	–	–	3	3
Miniature Jar	–	–	–	8	8
Miniature Vessel	–	–	–	3	3
Unidentifiable	–	3	16	15	34
Total	**2**	**82**	**57**	**71**	**212**

Table 19. Site 44ST2, residue by vessel form.

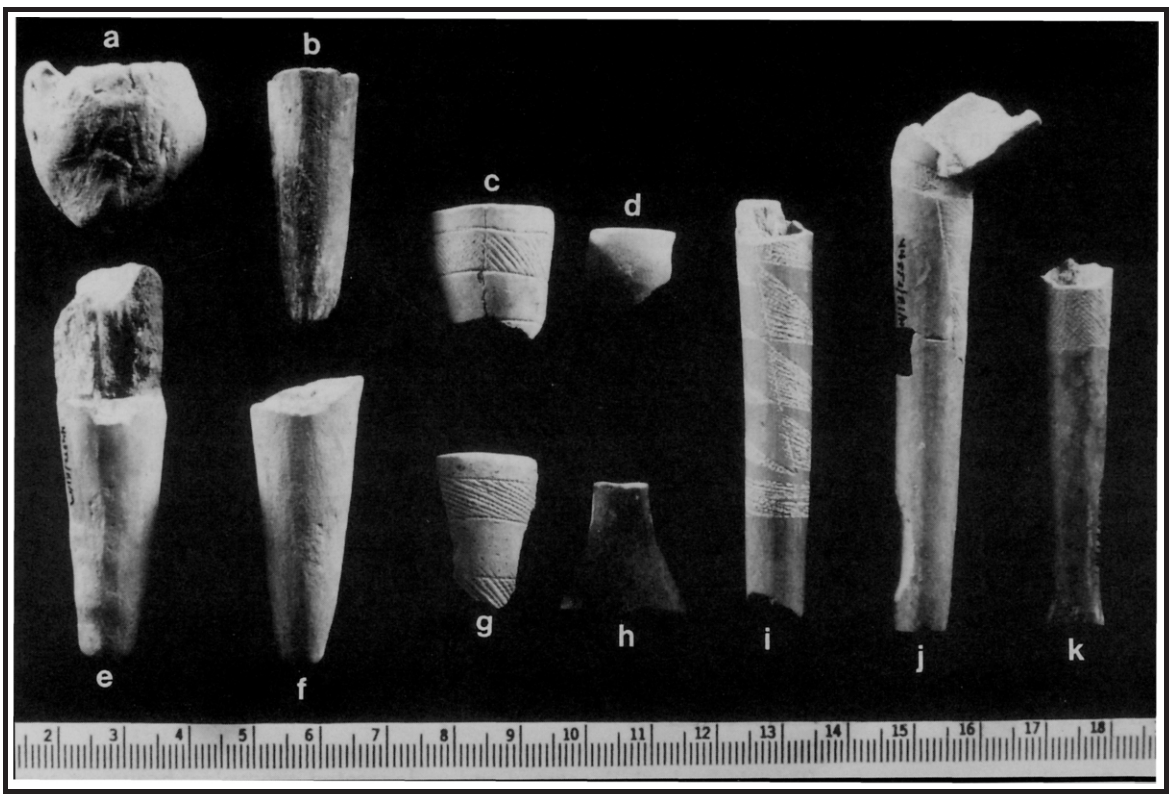


Figure 30. Site 44ST2, pipes (a - undecorated pipe bowl [F.1/C]; b - undecorated pipe stem [F.5/6/A]; c - decorated pipe bowl [F.1/H]; d - undecorated pipe bowl [F.1/K-1]; e - undecorated pipe stem [F.1/M]; f - undecorated pipe stem [F.1/E]; g - decorated pipe bowl [F.1/J]; h - triangular pipe bit [F.1/E]; i - decorated pipe stem [F.1/I]; j - decorated pipe bowl and stem [F.1/H]; k - decorated pipe stem [F.1/H]).

Provenience	Decorated		Undecorated	
	Bowl	*Stem*	*Bowl*	*Stem*
Surface	-	1	-	1
Feature 1	6	3	11	14
Feature 3	2	1	-	-
Feature 4	1	-	-	-
Feature 5/6	-	-	-	1
Feature 7	-	-	-	1
Feature 10	-	1	-	-
Feature 12	1	-	-	1
Feature 15	-	1	-	1
Feature 17	-	-	-	2
Feature 24	-	-	-	1
Feature 26	-	-	-	1
Total	**10**	**7**	**11**	**23**

Table 20. Site 44ST2, summary of pipe fragments by feature.

decorated. Those in the other category have an untapered stem, a large bore diameter, and are often decorated. Thirty-two percent of the pipes in the collection were decorated. Of these decorated fragments, 41.2% were bowl fragments and 58.8% were pipe stems (Table 20). Six of the decorated and five of the undecorated stems exhibited a high degree of polish. Decoration, when present, consists of "rouletted-like" linear bands (after Stewart 1992:57–73). Often these bands are accented with a triangle motif on both bowls and stems. Decorative techniques and styles seem to be consistent with pipes described from previous excavations at 44ST2 as well as examples from the Accokeek Creek Site (Moyaone). Color ranges from bright reddish orange to a pale buff. One stem contains burnt residue. The clay used to manufacture these pipes often included a fine micaceous sand similar to the ceramics classified as Potomac Creek Sand-Tempered.

Eighteen of the stems recovered have measurable bore diameters (Table 21). These fragments can be separated into two distinct groups based on pipe form. These two forms will be referred to as tapered and untapered (Figure 31). The tapered group includes six stems, none of which are decorated (see Figure 30b, e, f). Stems in this group have a larger outside diameter than the untapered group; however, their average bore diameter is significantly smaller. This group is associated with examples discussed in the Accokeek Creek Site report as Potomac Creek Plain Variant A (Stephenson et al. 1963:136). This group is probably related to the large undecorated bowls, and their overall form may be tubular (see Figure 30a).

The untapered group (n= 9) includes both decorated and undecorated examples; however, most of the undecorated fragments are small and often exhibit a surface polish consistent with decorated stems. Because decoration on most pipes does not extend the entire length of the stem, many of these fragments are suspected to be undecorated portions of decorated pipes. The untapered group has a larger average bore diameter than the tapered group, and bits are often flattened or slightly flared (see Figure 30j, k). One triangular pipe bit was recovered, and its surface polish and bore diameter potentially link it to the untapered decorated examples (see Figure 30h). The untapered group is consistent with examples discussed by

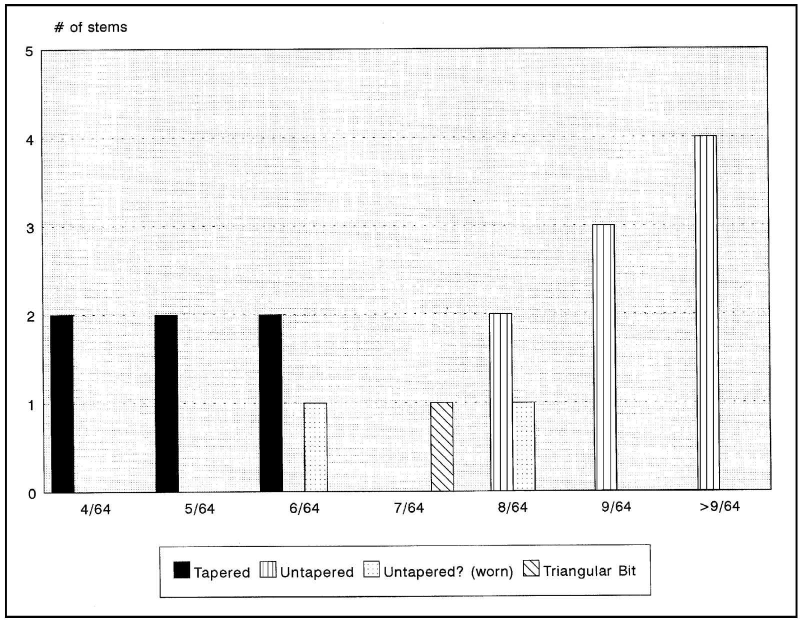


Figure 31. Site 44ST2, bore diameters of measurable pipe stems by form.

	Tapered	**Untapered**	**Untapered? (Worn)**	**Triangular bit**
Surface		1 - 9/64		
Feature 1	2 - 4/64 2 - 5/64	1 - 8/64 2 - 9/64 4 - >9/64		1 - 7/64
Feature 5/6	1 - 6/64			
Feature 7			1 - 8/64	
Feature 15		1 - 8/64	1 - 6/64	
Feature 17	1 - 6/64			
Average	**5/64**	**8.8/64**	**7/64**	**7/64**
Total	**6**	**9**	**2**	**1**

Table 21. Site 44ST2, bore diameters of measurable pipe stems by form.

Stephenson et al. (1963:133–136) as Potomac Creek Cord-Impressed or Potomac Creek Plain. One of these stems was mended to a partial bowl fragment creating an elbow pipe form (see Figure 30j). This group is probably associated with most of the decorated bowl fragments recovered. Two additional stems are also believed to belong to this group; however, the bits seem slightly tapered, possibly from use wear.

The two distinct groups of pipes identified within the 44ST2 assemblage are very different in form, bore diameter, and decoration. However, each of these groups has very little internal variation. The difference between the tapered and untapered categories in bore diameter and form may be reflective of separate functions and probably cultural traditions. Indeed, the more refined, rouletted, untapered form is distinctly "Chesapeake" in its style, to the point that many of the fragments from this late prehistoric site could be lost in later seventeenth-century collections from early English sites. They embody many of the attributes that Emerson (1988) and others (Henry 1979) refer to as specific to Chesapeake pipes. The tapered-stem style, however, is more commonly associated with Late Woodland forms throughout the Mid-Atlantic and based on stems alone cannot be strongly associated with a specific cultural tradition.

OTHER CERAMIC

Forty-eight ceramics that were not associated with ceramic vessels were recovered from 44ST2. These ceramics included three clay beads, one clay ladle fragment, and 44 pieces of unidentifiable ceramic (Figure 32).

Each of the clay beads has a unique shape. One is circular, one is oval, and one is a rounded square. All three of these beads are made of a clay similar in texture and composition to that typical of the Potomac Creek Sand-Tempered ceramics and pipe fragments. Similar clay beads were recovered during earlier excavations at 44ST2, and comparable examples were also identified at the Accokeek Creek Site (Stephenson et al. 1963; Stewart 1992).

One ladle fragment was identified. This artifact has a 4-cm-long handle that comes to a point on one end. The other end of the handle is attached to a portion of a hollowed bowl or scoop. This fragment appears to be composed of the same clay as the Potomac Creek Sand-Tempered ceramics. Similar ladle fragments were identified during previous excavations at 44ST2 (Stewart 1992).

The remainder of the materials classified as other ceramic were unidentifiable. However, one of these items may be a pipe preform, and another is a possible appendage for a ceramic vessel. Eight of the unidentifiable ceramics may be fragments of fired clay. These may represent accidental firing of pottery scraps. The remaining 34 items in the collection were too fragmentary to facilitate a positive identification. Similar amorphous ceramic bits were also identified during earlier excavations at the site. These have been previously interpreted as leftover material from pottery manufacture (Stewart 1992).

LITHIC ARTIFACTS

A total of 3,270 lithic artifacts were recovered, and as with all material generated by the project they are almost entirely from feature deposits. They represent only 15% of the total sample. The composition of the lithic artifact assemblage is as follows: 2,568 (78.5%) flaked stone, 23 (0.7%) ground stone, and 679 (20.8%) fire-cracked rock. Flaked stone and ground stone artifacts are summarized in Tables 22 and 23.

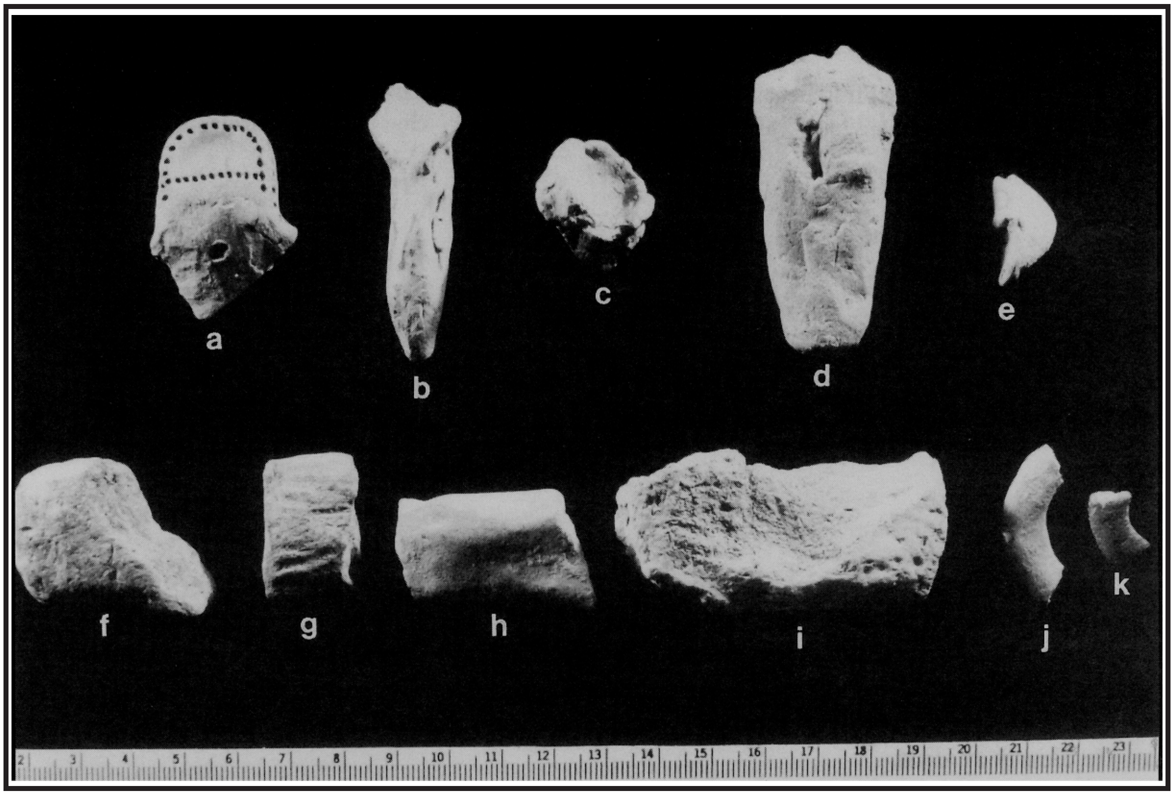


Figure 32. Site 44ST2, other ceramic artifacts (a - vessel appendage, punctate [F.1/E]; b - possible ladle fragment [F1/K-1]; c - unidentified ceramic [F.17 N½]; d - possible pipe preform [F.10/A]; e - unidentified ceramic [F1/D]; f - unidentified ceramic [F.15 W½]; g - unidentified ceramic [F.15 W½]; h - unidentified ceramic [F1/A]; i - unidentified ceramic [F1/C/D/surface]; j - unidentified ceramic [F1/M]; k - unidentified ceramic [F1/G]).

Raw Material	Hafted Bifaces	Other Bifaces	Other Formal Tools	Informal Tools	Cores	Debitage	Total
Quartz	45	87	28	22	78	2194	**2452**
Quartzite	3	3	3	–	3	31	**43**
Metavolcanic*	–	2	–	2	1	30	**35**
Chert*	1	–	–	–	1	12	**14**
Other*	1	1	1	–	1	18	**22**
Total	**50**	**93**	**32**	**24**	**84**	**2285**	**2568**

* "Metavolcanic" includes silicified slate, vitric tuff, and diabase. "Chert" includes unidentified chert, fossiliferous chert, chalcedony, and jasper. "Other" includes greenstone, orthoquartzite, slate, and steatite.

Table 22. Site 44ST2, flaked stone artifacts by raw material.

	Feature 1	Feature 5/6	Feature 12	Total
Steatite bowl fragment	2			2
Pitted cobble	3	1	2	6
Celt	1			1
Gorget	1			1
Hammerstone	1		1	2
Combination tool	1			1
Informal	10			10
Total	**19**	**1**	**3**	**23**

Table 23. Site 44ST2, ground stone artifacts by feature.

RAW MATERIALS

Localized lithic raw material procurement and use is the distinct pattern. Quartz (95%) is by far the most commonly utilized material (see Table 22). It is readily available at and near the site in the form of small cobbles and pebbles. The cobbles and pebbles are abundant in the marine sediments on the terrace at Indian Point and constantly erode from stream exposures or appear in subsoil. A very large proportion of the debitage and cores retain cortex from these rounded nodules. Specific strategies for reducing the small nodules are clearly evident.

Other kinds of raw material are represented among flaked stone artifacts, but none in a distinct majority after quartz (see Table 22). Quartzite is only slightly more common than metavolcanic, chert, and other materials. It is likely that even these types are occasionally available locally as small pebbles or cobbles. The more likely nonlocal materials are these pieces of debitage: two of fossiliferous chert, nine of unidentified chert, and seven of orthoquartzite. The likelihood is high that all of the “nonlocal” materials originated at western sources, specifically the Blue Ridge/Ridge and Valley area. Cherts occur widely in the Ridge and Valley, including fossiliferous types. Orthoquartzite is known to occur well up the Potomac in the vicinity of Harpers Ferry where there is a variety of the same name (Bottoms 1968). A source for metavolcanic materials may be in river cobbles, but a potential primary source are the outcrops known to occur in western Maryland in the Blue Ridge (Custer 1988).

The ground stone artifact assemblage also consists largely of locally available materials. These occur mainly as cobbles of limestone and quartzite. The slate is as likely to be nonlocal as local. The steatite bowl fragments represent an obvious nonlocal material, available west of the Fall Line in the Piedmont.

HAFTED BIFACES

Fifty hafted bifaces and hafted biface fragments were recovered (Table 24) (see Table 22). At least three different components are represented by these artifacts (Figure 33). Two Savannah River types are indicative of a light Late Archaic occupation. The single Piscataway point dates from the end of the Late Archaic or Early Woodland period. The majority (60%) of these artifacts are small triangular arrow points characteristic of the Late Woodland period. The remainder are unidentifiable fragments.

Feature No.	Hafted Bifaces	Other Bifaces	Other Formal Tools	Informal Tools	Cores	Debitage	Total	Ratio Debitage: Tools	Ratio Debitage: Cores
1	34	73	21	20	53	1515	1716	10.2	28.6
3	1			1		33	35		
4	1	1			5	61	68		
5/6	2	1	1	1	2	95	102		
5	1	2	1		1	62	67		
6/7						7	7		
6	1					20	21		
7	1	1				55	57		
8		2			2		4		
9						3	3		
10						47	47		
11						4	4		
12	2	5	3		7	117	134	11.7	16.7
14						5	5		
15	5	4	4	2	7	39	61	2.6	5.6
16					1		1		
17	1		1		3	72	77	36.0	24.0
21						3	3		
22						12	12		
23		1				12	13		
24						22	22		
25	1	1	1		2	30	35	10.0	15.0
26						3	3		
Surf/Spoil		2			1	68	71		
Total	**50**	**93**	**31**	**24**	**84**	**2285**	**2568**		

Table 24. Site 44ST2, flaked stone artifacts by feature.

Type	Quartz	Quartzite	Orthoquartzite	Unid. Chert	Total
Savannah River	1	1			2
Piscataway	1				1
Small Triangular	27	1	1	1	30
Unidentified/Fragments	16	1			17
Totals	**45**	**3**	**1**	**1**	**50**

Table 25. Site 44ST2, hafted bifaces by raw material.

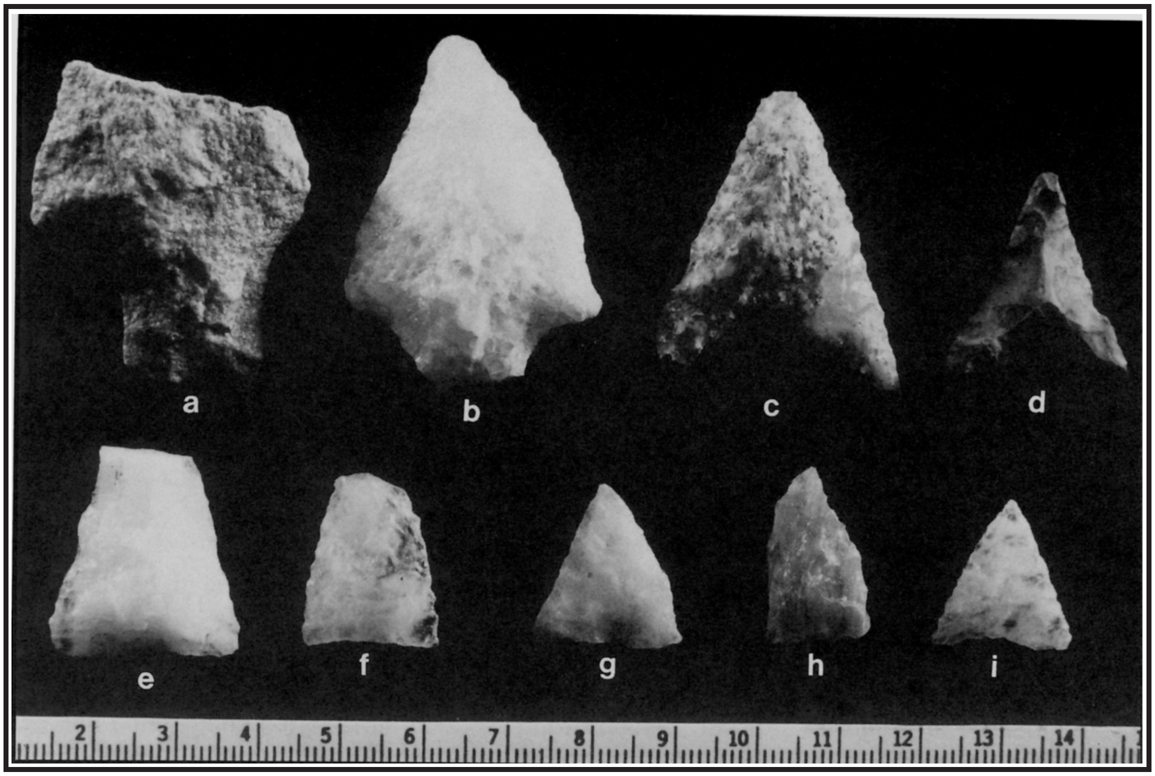


Figure 33. Site 44ST2, hafted bifaces (a - Savannah River cluster, quartzite [F.1/A]; b - Savannah River cluster, quartz [F.1/G]; c - small Woodland triangular cluster, metaquartz [F.1/J]; d - small Woodland triangular cluster, unidentified chert [F.15 W½]; e - small Woodland triangular cluster, quartz [F.5/6/A]; f - small Woodland triangular cluster, quartz [F.1/H]; g - small Woodland triangular cluster, quartz [F.15 W½]; h - small Woodland triangular cluster, quartz [F.1/I]; i - small Woodland triangular cluster, quartz [F.15 W½]).

Most hafted bifaces (78%) were recovered from Features 1 and 15, the perimeter ditch which contributed the largest volume of excavated fill and artifacts (see Table 24). Of the other 11, an intriguing 64% were found within the narrow palisade trenches. Only four are from pit features.

All hafted biface types exhibit the strong pattern of local lithic raw material utilization (Table 25). Only the small triangular points include examples of potentially nonlocal material, one of orthoquartzite and another of unidentified chert.

OTHER BIFACES

The 93 artifacts in this category generally represent what are also known as staged bifaces or preforms, or the unfinished products of biface reduction. Many are probable hafted biface preforms but almost any of them could also serve as cutting tools. The sizes of these artifacts indicate that they are broken preforms for small triangular points, but the fragmentary condition of most (71%) hinders positive functional classification. Like most artifact types, these bifaces were most (82.8%) often found in Feature 1/15 contexts (see Table 24).

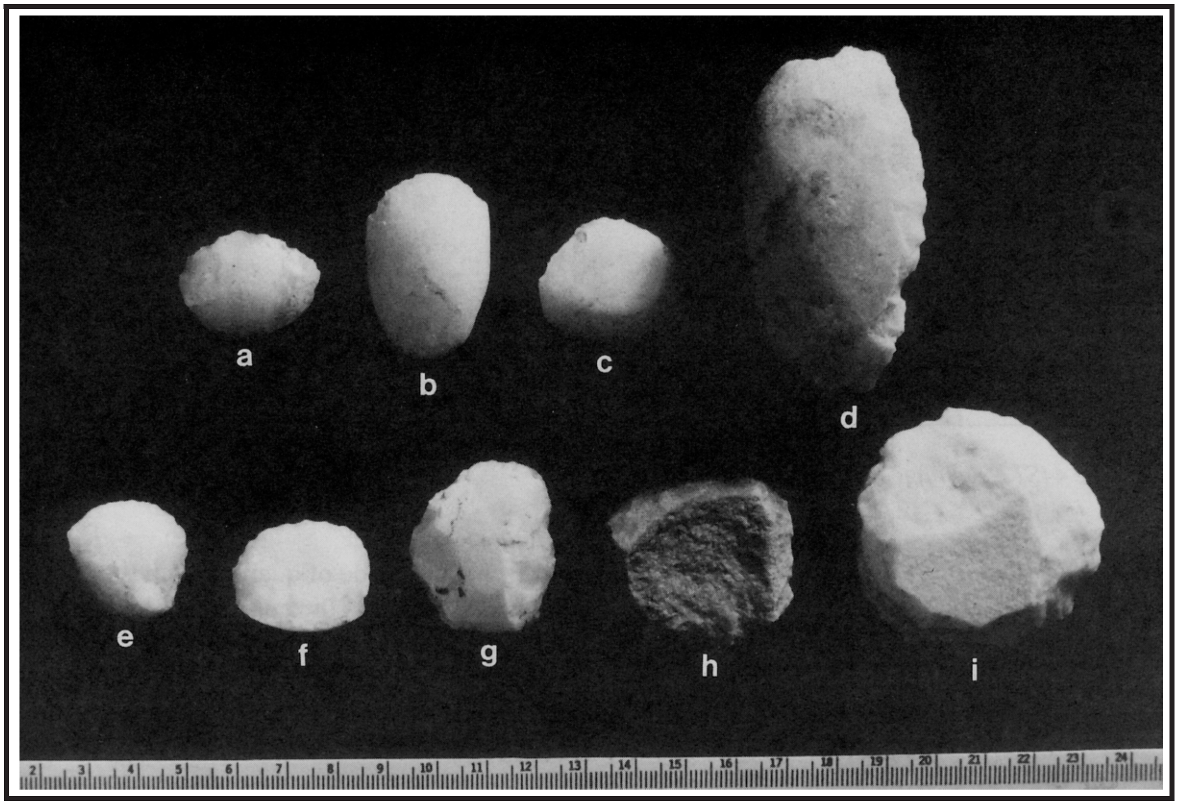


Figure 34. Site 44ST2, formal lithic tools (a - endscraper, quartz [F.1/J]; b - endscraper, quartz [F.1/E]; c - endscraper, quartz [F.1/H]; d - sidescraper, quartz [F.15 West Half]; e - endscraper, quartz [F.1/G]; f - endscraper, quartz [F.1/G]; g - endscraper, quartz [F.1/K-1]; h - other form scraper, quartzite [F.12a W½]; i - other form scraper, quartzite [F.12a W½]).

The bifaces were classified according to reduction stages following criteria defined primarily by Callahan (1979). Under this scheme, intermediate stages predominate, with Stage 2 and 3 types together representing 69.9% of the total. Early, Stage 1 bifaces (11.8%) and late, Stage 4 bifaces (18.3%) occur with similar low frequency.

The tendency to use quartz (93.5%) is also evident among the bifaces (see Table 22). Other materials represented, in order of frequency, are quartzite, vitric tuff, slate, and silicified slate.

OTHER FORMAL TOOLS

Four other types of formal tools (n=32) are identified (Figure 34). Most common are unifacial, steep-angle endscrapers (81.3%, n=26). The endscrapers resemble forms better known in Paleoindian and Early Archaic assemblages, but tend to be more disk-shaped than elongated. It is clear that they are an important element of the Potomac Creek lithic toolkit. Formalized unifacial scrapers are often interpreted as primarily hide-working tools and in this assemblage may reflect that hide preparation was a common activity. Endscrapers were recovered from secure feature contexts, with most (84.6%) from Feature 1/15; only three

Type	Quartz		Quartzite		Metavolcanic		Unidentified Chert		Other		Total
	NC	*C*	*N*	*C*	*NC*	*C*	*NC*	*C*	*N*	*C*	
Primary/Reduction Flake	18	176		10	2						**206**
Secondary/Biface Thinning Flake	489	230	4	1	10	2	5		5	1	**747**
Tertiary/Retouch Flake	1										**1**
Bipolar Flake	2	154									**156**
Flake Fragment/Shatter	712	392	11	3	12	3	2	1	9	3	**1146**
Angular, Blocky Fragment/ Chunks	6	12						4			**22**
Tested Cobble/Nodule		2		2		1					**5**
Total	**1228**	**966**	**15**	**1624**	**24**	**6**	**7**	**5**	**14**	**4**	**2285**

Table 26. Site 44ST2, debitage type by raw material and cortex.

are from pit features. It is notable, too, that all of the endscrapers are made of quartz. Patches of cortex on several establish that their production may account for a sizable portion of the quartz pebble debris.

Two flaked drill bits were recovered. One is made from quartz and the other from orthoquartzite. These rather small tools were carefully, bifacially flaked and likely were of a simple T-shaped form.

One sidescraper made from a quartz pebble spall is another tool in this general category. The other three formal tools are all made of quartzite and include an axe or hoe fragment and two discoidal scrapers.

INFORMAL TOOLS

The 24 informal tools identified are equally divided between retouched and utilized flakes. All but two are made from quartz, one of which is a retouched flake of silicified slate and the other a utilized flake of vitric tuff. Identification criteria for simple, flake tools was conservative, to the point that this sample size is probably well below what may actually be present. This is most true of simple, utilized flake tools that bear only the faintest macroscopic traces of use. All but two of the informal tools were recovered from the ditch features (Feature 1/15) (see Table 24).

CORES

Cores (n=84) were relatively common in the lithic assemblage. Bipolar cores (57.1%) are the most common recognizable type. These all consist of battered or split quartz pebble nuclei. As noted elsewhere, quartz was heavily used and the obvious source is small locally available pebbles and cobbles. It is widely recognized that an efficient method of flaking such small nodules is bipolar reduction (Flenniken 1981), whereby blanks for small points and tools like endscrapers can be generated. It will be noted later that the several pitted cobbles in the sample are candidates for anvils necessary in bipolar reduction.

Other core types represented are randomly flaked (13.1%) and bifacially flaked (5.4%) forms. All of the bifacial cores are small and made from quartz. Most of the 11 random cores are quartz, but three are quartzite and one is unidentified chert. Twenty (21.5%) examples are core fragments, at least some which are probable bipolar pieces. With the exception of one orthoquartzite and one vitric tuff fragment, all are of

Feature No.	Primary/ Reduction Flakes	Secondary/ Thinning Flakes	Tertiary/ Retouch Flakes	Bipolar Flakes	Flake Fragment/ Shatter	Angular, Blocky Fragment/ Chunks	Tested Cobble/ Nodule	Total
1	158	509	1	102	723	18	4	1515
3	3	9		4	17			33
4	1	19			41			61
5/6	3	33		4	53	1	1	95
5	1	17		4	40			62
6/7		3			4			7
6	1	7		1	11			20
7	3	18		5	29			55
9		1		1	1			3
10	4	20		2	21			47
11	1	1			2			4
12	15	32		13	55	2		117
14					5			5
15	5	11		4	18	1		39
16								0
17	3	24		5	40			72
21		2			1			3
22		5		1	6			12
23	3	1			8			12
24	1	5		2	14			22
25		11		3	16			30
26					3			3
Surf/Spoil	4	19		5	40			68
Total	**206**	**747**	**1**	**156**	**1148**	**22**	**5**	**2285**

Table 27. Site 44ST2, debitage type by feature.

quartz. Cores tended to be recovered from the ditch features as well, but they also occur in pit features and palisade trenches (see Table 24).

DEBITAGE

Lithic debitage, representing the by-product of flaked stone tool production, is among the more common artifact types (n=2,285) and accounts for most of lithic material in the overall assemblage. As noted in an earlier section, quartz is the most common raw material type (96%), and none of the other raw material categories contribute more than 1% to the assemblage (Table 26). Again, the dominance of quartz is not at all surprising given its local abundance, and it will be clear that this further accounts for characteristics of the lithic debris. Recall that locally available quartz tends to occur as small pebbles, found either in exposures of marine deposits or scattered along the shoreline.

Three characteristics of the debitage are revealing of the Late Woodland technology: a high frequency of cortical debitage (40–50%), common bipolar debitage/cores, and an abundance of flake fragments/shatter (50%) (Table 27). All of these characteristics, especially knowing of the intensive use of quartz pebbles, are highly indicative of a reliance on bipolar reduction. This reduction method is particularly well suited for splitting pebbles (Flenniken 1981) in the early stages of tool production. (Note that virtually all of the recognizable bipolar flakes retain pebble cortex (see Table 27). This mode of reduction creates an abundance of angular fragments but also results in relatively thin sections for projectile point or other tool "blanks." In fact, a number of the discoidal, uniface scrapers are clearly made from sections of split pebbles (see Figure 34). Also, the pitted stones described in a following section are probable "anvils" used in bipolar reduction.

Following flake fragments/shatter, secondary/thinning flakes are the most common category of debitage (33%). These pieces probably result from final tool reduction or tool maintenance. They are likely the product of finishing or resharpening small tools like small triangular points or scrapers using pressure-flaking or controlled percussion methods.

In short, the debitage assemblage is highly indicative of adjustments to local conditions and specific tool production. Bipolar reduction was the method of choice because it allows consistent production of usable pieces from small pebbles, including blanks suitable for small projectile points and unifacial scrapers, and it is these two formal tool types that dominate the hafted biface and other formal tool classes.

GROUND STONE

Twenty-three ground stone artifacts were recovered (see Table 23). Most common (n=10) are informal pieces that exhibit only light modification from use, the equivalent of utilized flakes in the flaked stone assemblage. The most common use alteration is from pecking or pounding.

Pitted stones (n=6), usually cobbles, are the most common recognizable form. They are distinguished by small, cup-like pits on flat surfaces, often on opposing faces of a stone. These traditionally are referred to as nutting stones but a more plausible interpretation is use as anvils for bipolar reduction.

Other types of ground stone artifacts are one celt fragment, one gorget fragment, two hammerstones, and two steatite bowl sherds. All of the ground stone artifacts, with the exception of the Late Archaic bowl fragments, are associated with the Potomac Creek occupation. The ground stone artifacts are primarily from Feature 1 (82%). One pitted stone is from a palisade trench (Feature 5/6) and two are from Feature 12, as is one hammerstone. The slate gorget fragment is flat and indicates that the overall form was rectangular. Stone gorgets of this kind tend to be associated with Early or Middle Woodland components, and at this site may have been deposited at roughly the same time as the Piscataway point. There is also the possibility that it was "recycled" by Late Woodland occupants of 44ST2.

BONE AND SHELL ARTIFACTS

Preservation of organic remains like bone and shell was very good in the excavated features. Bone was recovered in abundance, but shell was surprisingly scarce. Although all of the bone was not included in the formal, zooarchaeological analysis, a systematic search was made of the entire sample to identify tools.

Feature:	1	5	5/6	6/7	7	10	12	15	25	26	Total
Bone											
Cut	12						2		1		15
Polished	3										3
Awl	11		1		2		2		1		17
Splinter awl	5	1					2	1			9
Utilized splint.	10	1					2	1	1		15
Bead	1						1				2
Turtle	2						1				3
Fish hook			1								1
Other	1					1					2
Antler											
Flaker	9										9
Cut tine	4										4
Handle	8						2			1	11
Awl	2										2
Shell											
Bead			1	1							2
Fossil clam							1				1
Fossil tooth											1
Totals	**69**	**2**	**3**	**1**	**2**	**1**	**13**	**2**	**3**	**1**	**97**

Table 28. Site 44ST2, summary of worked bone and shell artifacts by feature.

BONE ARTIFACTS

Bone artifacts were common, with a total of 97 identified among the total sample of faunal material (Table 28); 1% of all animal bone was recognized as having been modified for or by use. Bone used for tools included turtle shell and antler.

Sixty-seven bone tools were recognized that represent six general categories (Figure 35) (see Table 28). The most common are awls or awl-like pieces (n=41) that can be subdivided according to degrees of refinement. Highly refined, polished and sharpened awls are the single most common type (n=17). They tend to be of medium to small size and are most often made from large mammal bone shaped overall. Less formal but obviously sharpened pieces were referred to as splinter awls (n=9). These are long splinters of bone or split bones with usually only one end carefully sharpened. The other awl type is referred to aptly as utilized splinters (n=15). They are relatively common and, as the general equivalent of expedient, utilized lithic flakes exhibit only damage from use rather than formal modification. These awl-like tools were primarily from Features 1 and 12.

Other formally shaped bone was not common. Two bone beads were recovered, one of which is a medium length tubular type and the other is heavier and barrel-shaped. One is from Feature 1 and the other from Feature 12. The other formal bone tool type is a fragment of a fish hook blank from Feature 12.

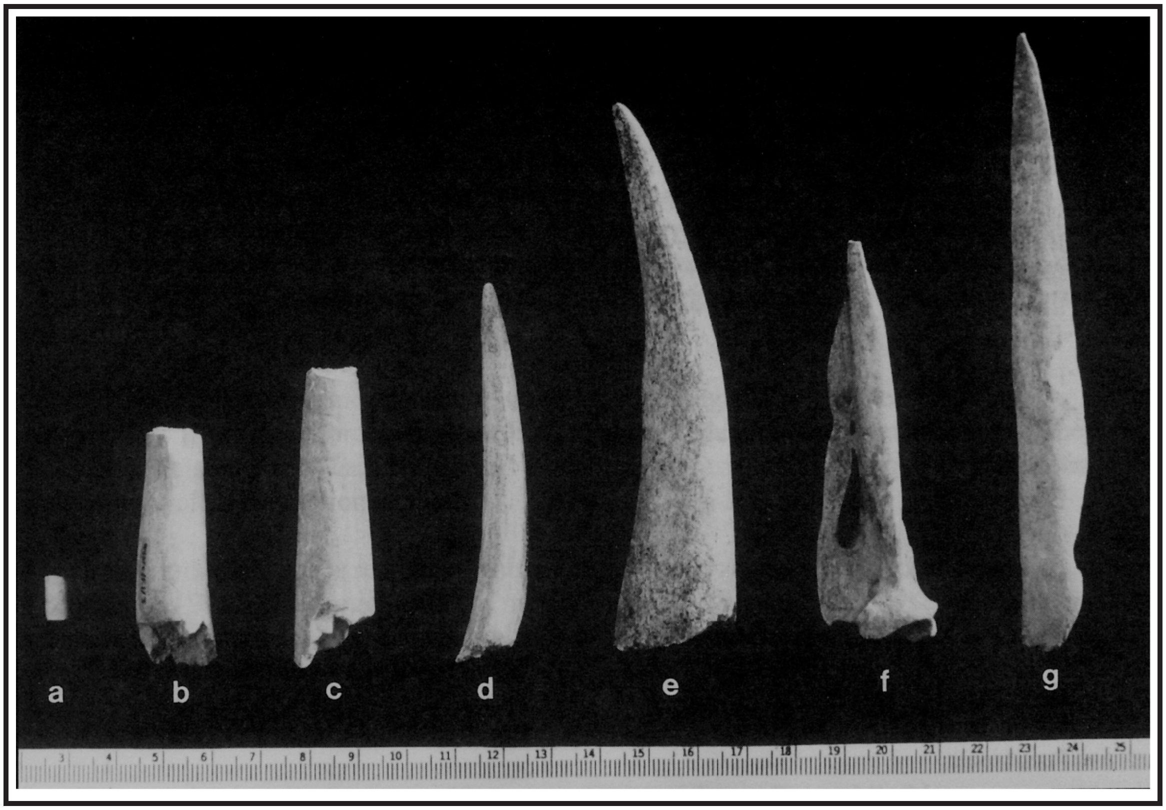


Figure 35. Site 44ST2, worked bone (a - bone bead [F1/E]; b - cut and worked antler [F.1/J]; c - cut and worked antler [F.1/E]; d - antler tine flaker [F.1/H]; e - antler tine flaker [F.1/G]; f - utilized bone awl [F.1/G]; g - bone awl [F.1/M]).

Many pieces of bone can only be described as modified. One category of this kind is cut bone (n=15). Most cut bone was recognized as having been scored and then snapped, presumably to obtain material for tools. A few polished bone pieces (n=3) were also identified, at least some of which are probably the midsections of refined awls. Three pieces of modified turtle shell were also recorded. One is highly polished on the dorsal surface and the inside of the shell has been modified by partially removing bony proturbences. Another example shows evidence of grinding along the margin and possibly some interior alteration. The use of these artifacts is uncertain, but they may have functioned as bowls or scoops, or as rattles. In this general group are two "other" pieces of worked bone of unknown function.

Twenty-six pieces of modified deer antler were identified. Most common (n=11) are possible tool handles or hafts. These are recognized by modification at one end to create either a socket-like cavity or a narrow incision for seating stone or bone tools. They are followed in frequency by what appear to be light-duty percussion flakers, or batons (n=9). These are typically not more than 5–8 cm long and only 1–2 cm in diameter, with rounded ends. Cut antler tines (n=4) were identified and, like cut bone, they show distinct evidence of having been scored and snapped. Here again, like cut bone, this was probably the first step in acquiring pieces or "blanks" for tool manufacture. Two highly sharpened pieces are fragments of awls or the distal tips of projectile points. All but three of the modified antler pieces are from Feature 1 (see Table 28).

SHELL AND FOSSIL ARTIFACTS

Shell artifacts were not common (n=3). Two are shell beads which, unexpectedly, are from narrow palisade trenches (see Table 28). They are both flat, disk-shaped beads, probably made from freshwater mussel shell.

There is some indication that fossil clam shells were modified for use, perhaps as scoops or bowls. In the clearest example from Feature 12, the ventral edges including the hinge portion have been ground flat. Other fossil shells (n=11) were found, and, in fact, their recovery is a longstanding feature of this site (Stewart 1992). Consistent with the earlier work, the most common type found is *Turitella* sp. shells (n=10); the other fossil shell is from a bivalve. Most show no obvious intentional alteration. Most fossil shells are from Feature 1.

One fossil shark tooth was recovered from Feature 1. It is elongated, and probably from a sand shark.

HISTORIC PERIOD/EUROPEAN MATERIAL

Only two historic period artifacts were recovered, both of which are nails from previously excavated sections of the ditch feature (Feature 1). There was, in fact, a remarkable absence of non-native artifacts given the expectations from earlier work. The total absence of seventeenth-century European items substantiates the prehistoric dates of the occupation.

ETHNOBOTANICAL MATERIAL

For the first time, ethnobotanical remains were recovered from secure contexts at 44ST2 and processed by flotation. Samples of this material were submitted to Justine K. McKnight for thorough ethnobotanical analysis, and her complete report is provided in Appendix B. This discussion consists only of a summary of the results. Readers should appreciate that the samples processed and analyzed for plant remains is small, amounting to a total of 56 liters of floated soil from 16 features. The results are considered to be representative but lack the richness that can permit sophisticated inferences.

The project has succeeded in recovering a sample of domesticated cultigens along with an array of expected, naturally available plant foods (Tables 29 and 30). Nutshell, primarily hickory, is the most common plant food remain in evidence, occurring in all samples. Tropical cultigens were also found to be nearly ubiquitous but occur in much smaller amounts. Indeed, the low visibility of these remains was not expected and raises taphanomic questions. McKnight reports that preservation of remains overall is quite good and goes on to state that this argues against loss to deterioration after deposition. Another factor may have to do with the means of processing the domesticated plant foods. Hypothetically, for example, preparation of stews or porridges is less likely to cause charring and, thus, also less likely to preserve seed remains than roasting would. Beans and squash are even less common than maize. Seeds from native starchy/oily plants were rare. The few seeds identified represent grape, chenopod, amaranth, and grass.

Ethnobotanical remains recovered from this project evince a fairly diversified economy, seemingly as reliant on native wild plants as domesticated species. This finding is consistent with studies elsewhere in the Mid-Atlantic and northeastern U.S. In these regions, the scale of horticultural food production is somewhat moderate and may represent a supplement to native food contributions as opposed to the reverse. Turner (1992:107–108), for example, determined that only nine sites in Virginia's Coastal Plain have records of tropical domestic remains. Among these is the Taft Site (44FX544), where one squash seed was found

Feature No./ Description	Maize	Squash (seed)	Bean	Flotation Sample Volume (l)
1/ditch	30	–	2	6
3	1	–	–	3
4	2	–	–	3
5/6	–	–	–	3
6/7	–	–	–	3
8	13	–	–	3
9	–	–	–	3
11	–	–	–	3
14	–	–	–	3
12/large basin	12	1	1	6
15/ditch extension	2	–	2	6
17	–	–	–	6
18	1	–	–	1
19	1	–	–	1
25/large basin	2	–	–	3
26/small basin	2	–	–	3

Table 29. Site 44ST2, summary of cultigens in ethnobotanical samples (total count).

associated with a Potomac Creek component. This observation runs counter to what might be anticipated from only ethnohistorical sources that document impressive quantities of corn at the historic Patawomeke village (Dent 1995:254; Potter 1989, 1993; Smith 1986b). Turner (1992:108) is inclined to attribute this disjunction to poor preservation rather than actual circumstances, but acknowledges that this may not be the case.

PHYTOLITH ANALYSIS

An interesting component to our assessment of Potomac Creek subsistence and the local environment involved phytolith analysis. Five samples from different features were examined by Dr. Lisa Kealhofer, the full report for which is provided in Appendix D. This pilot analysis was intended to assess the potential for phytolith studies in the area and to provide an independent measure of subsistence patterns, namely the prominence of maize.

The five features contributing samples were the perimeter ditch (Feature 1), two palisade trenches (Features 4 and 10), and two pit features (Features 12 and 14). The original samples were soil from feature fill, and these were processed to separate phytoliths, which ultimately were mounted on glass slides for examination. Approximately 200 phytoliths were counted per slide to record a representative range. Preservation tended to be good, but phytoliths were not common in the fill. Phytolith identifications relied on comparison with published references and with a growing reference collection housed at the Colonial Williamsburg Foundation.

Generally speaking, the local plant cover is described as open forest, meaning a mosaic of forested and open land. Kealhofer injects the caution that this characterization is tentative given the highly cultural character of the sample deposits. The degree of selection for plant remains that might have occurred in the context of a settlement of this kind may be significant. To the extent that this description is accurate, it is

Feature No.	Bone	Nutshell	Seed	Cultigen
1	6730	38 (.73 g)	2	31
3	148	4 (.15 g)	1	1
4	126	7 (.17 g)	–	2
5/6	352	2 (.04 g)	1	–
5	85	–	–	–
6/7	25	1 (<.01 g)	–	–
6	18	–	–	–
7	36	–	–	–
8		4 (.03 g)	6	13
9	44	1 (.02 g)	1	–
10	54	–	–	–
11	20	–	2	–
12	1115	92 (5.39 g)	3	14
14	11	61 (1.66 g)	1	–
15	869	23 (.33 g)	1	4
17	327	7 (.09 g)	5	–
18		4 (.06 g)	–	–
19	4	2 (.04 g)	–	–
20	1	–	–	–
21	10	–	–	–
22	9	–	–	–
23	54	–	–	–
24	34	–	–	–
25	154	16 (.26 g)	–	2
26	25	17 (.25 g)	2	2

Note: Floral remains listed are only those from analyzed flotation samples

Table 30. Site 44ST2, summary of subsistence remains by feature.

consistent with expectations for the environs of a Late Woodland village set in a clearing and surrounded by other clearings for farmsteads and gardens. The occurrence of Pooid grasses may indicate an environment experiencing cold, dry winters and a setting with areas open to sunlight where weedy plants could thrive.

The Panicoid subfamily of grasses dominates the sample, and it is in this taxon that *Zea mays* occurs. Phytoliths specifically diagnostic of maize were not abundant (5–10%), but other phytolith types are believed to represent maize. In other words, maize probably is better represented than the diagnostics indicate. The recognized maize forms also indicate that different parts of the plant are represented, but the distribution of husks versus cobs shows no significant patterning in the samples. If anything, these results show variable patterns of disposal within the site. The lack of diagnostic leaf forms, however, indicates that initial processing took place outside the site proper. In essence, and consistent with the ethnobotanical results based on flotation, maize is rather common in its occurrence and even ubiquitous across the project area, but it does not occur in notable abundance.

An interesting observation is that sclereid and dicot types typical of tree/shrub species have a particularly strong presence in Features 1 and 10, both of which are enclosure features. Their association with palisades makes the prominence of these types quite understandable. A clear abundance of starch grains in Feature 1 was noted, as well. These are indicative of the economically important parts of plants such as fruits and seeds. The ultimate function of the Feature 1 ditch for refuse disposal probably explains this evidence, in the sense that all manner of debris including food remains were disposed of there.

The limited exploration of phytoliths at this site serves to demonstrate the enormous potential this kind of evidence has in regional archaeology, especially as a complement to traditional ethnobotanical studies. Kealhofer notes, however, that more expansive analyses are necessary to allow thorough interpretations. A site-specific contribution is the independent determination that maize occurs, albeit at a modest level. Additionally, some details of the local environment and suggestions concerning potential feature function/disposal patterns were discerned.

ZOOARCHAEOLOGICAL MATERIAL

The systematic analysis of faunal remains conducted as part of this project is also the first of its kind for a Potomac Creek village. A sample of 4,587 bones from six features, 46% of the total recovered, was analyzed by Gwenyth Duncan; her report is included as Appendix C. The sample examined is considered to be strongly representative of the site as a whole. Key findings of the faunal analysis are summarized here.

1. Most (66%) of the bone examined is from Feature 1, the midden-filled, encircling ditch that produced most artifacts of all kinds.

2. The assemblage overall is reflective of year-round, permanent occupation. A broad spectrum of animal species were exploited but certain types were favored as food resources.

3. Most of the bone is from large to medium sized mammals, and the largest identifiable set represents whitetail deer (24%). Deer represent 74% of the total biomass. There is evidence that mature deer were selected for in the hunt, potentially to maximize meat yield. The high frequency of larger, mature deer in this assemblage may reflect the fact that it was the residence of chiefly elites and their families and associates.

4. Waterfowl and fish are not common in the assemblage. Undoubtedly, they were exploited to some degree but their capture and consumption may have been more characteristic of sites occupied by smaller groups on a seasonal basis.

5. There are differences among individual feature assemblages. Most notable is the distinction in Feature 12 of a higher proportion of fish. This is also the latest dated feature in the project area.

SUMMARY

The sample of artifacts generated by this project is impressive in terms of quantity, diversity, and quality. It is regarded as generally representative of the site as a whole, but it is derived from only one section representing approximately 11% of the maximum site area. Also, most of the material is from one feature (Feature 1), a ditch, that was filled with general debris over a span of time. Positive aspects are the controls offered by several dated pit features, as well as the simple fact that the material is almost all from secure feature context of one kind or another. Judging from reports of prior work, both the kinds of features sampled and the artifacts recovered are consistent with what lies elsewhere on the site, with the sole exception of burial contexts.

The ensuing discussion will address the implications of these findings in detail. A succinct summary of the material remains, however, is that occupation of the site occurred only during the prehistoric era, the predominant culture in evidence is what we know as Potomac Creek, the associated material culture changed over time, and the site’s function changed through time.

CHAPTER 5:
Summary and Conclusions

Preceding chapters have provided thorough descriptions of the results of this data recovery project at a portion of the Potomac Creek Site (44ST2). This final chapter is concerned with placing those results in the context of Late Woodland archaeology and Potomac Creek Culture studies at the regional level, and also with contributing to the interpretation of the Potomac Creek Site and the origins and development of Potomac Creek Culture. The hope is that our interpretations, some of which are intentionally provocative, will be put to the test and further improved.

CHRONOLOGY

Occupation of 44ST2 occurred only during the prehistoric era. Later use was limited to mortuary activity, probably by residents of nearby 44ST1.

The eight radiocarbon dates obtained by this project are quality assays in the sense that care was taken to select material for dating only from secure contexts, and as often as possible as individual pieces. Extended counting was approved as necessary, and they were all calibrated against tree ring curves. They indicate that occupation occurred by AD 1300 and ended before the seventeenth century, with a median calibrated date of AD 1458 (see Table 4).

These results are consistent with most published ranges for Potomac Creek Culture, except that the occupation does not extend into the historic period. Potter (1993:125) brackets the span of the Potomac Creek complex between AD 1300 and the seventeenth century, following similar estimates of Clark (1980:8) and Egloff and Potter (1982:112). He notes that earlier dates closer to AD 1200 are reported from sites in Delaware, Maryland, and Virginia but that the context for them is not always secure. Comparison with uncorrected and uncalibrated dates can also lead to inconsistent results.

These new dates for the Potomac Creek Site were examined against those reported for other neighboring, Late Woodland complexes. Rather than the neat succession of phases or complexes within and between physiographic regions depicted in regional overviews, there is considerable overlap. Dates for 44ST2 compare very closely to those from the Winslow Site (18MO9) (635±80 BP and 665±100 BP uncorrected), located on the Potomac River in the Piedmont (Moore 1994:18–19). This is one of several Montgomery Complex sites upstream that are routinely cited as the habitations abandoned by an antecedent population that was to become Potomac Creek. Similar dates are also reported within the broader span for the Rosenstock Site (18FR18), another Montgomery complex site on the Monocacy River, a Potomac tributary (Kavanaugh 1982). The Potomac Creek Site dates also correspond closely to those obtained from Luray Focus sites in Piedmont Maryland such as the Moore Village (18AG43) and the Hughes Site (18MO1) (Moore 1994:19). Eight uncorrected dates for these two sites range from 660±50 BP to 420±60 BP, with the exception of one date of about 200 BP. The Potomac Creek date range also falls within the lengthier span of the Townsend (Rappahannock complex) culture that persisted to the east and south between AD 900 and 1600 (Clark 1980; Potter 1993:114).

Expanding the temporal comparisons further afield is also helpful in defining the cultural context for the Potomac Creek Site. Well to the north, the Shenks Ferry Complex on the lower Susquehanna River was flourishing during the same period as Potomac Creek (Custer 1986) (Figure 36). Further north still, the

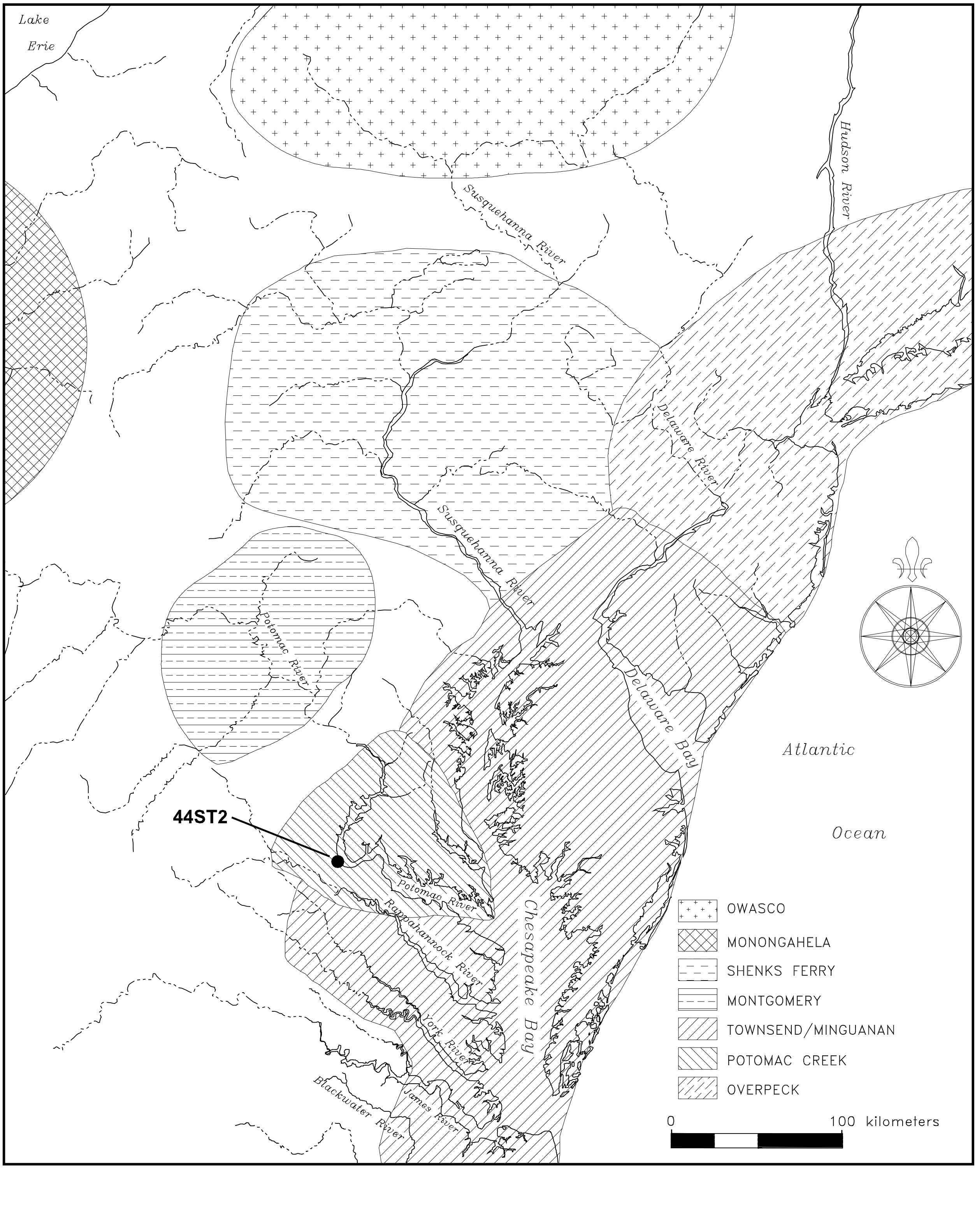


Figure 36. Late Woodland culture areas of the Mid-Atlantic region.

Owasco cultural complex was in its later stage, defined as the Castle Creek phase between AD 1250 and 1350 (Snow 1994a, 1995, 1997). It was succeeded in that area first by the early Iroquoian Oak Hill phase (AD 1350–1400) and later by the Chance phase (AD 1400–1550). Well to the west, beyond the Appalachian chain, the Monongahela culture was in place between AD 1100 and 1635 (Snow 1994b:211).

All of these neighboring, coeval cultural complexes potentially affected development of the Potomac Creek complex. As expected, material culture and other traits evident from work at 44ST2 indicate stronger links with some populations than others. Later discussion will elaborate on evidence that influences were stronger from the north and west and at perhaps greater distances than typically believed.

SITE FUNCTION AND DEVELOPMENT

The complex pattern of enclosure features at 44ST2 is a challenge to untangle, especially with less than complete documentation, and it is likely that a perfectly precise interpretation will always elude us. The challenge is an important one to meet, however, since understanding the basic sequence of events in the site's history can reveal much about the condition of Potomac Creek society over two and a half centuries.

That the Potomac Creek population had organized as a chiefdom with a "king" is most clear from early seventeenth-century ethnohistorical records. English observers recorded that the "Patawomeke" enjoyed reasonable relations with the Powhatan groups to the south, but that they remained independent of the paramount leader's influence.

Stephen Potter (1993) notes that explanations for formation of the Potomac Creek chiefdom are on par with those forwarded for emergence of the better-known Powhatan chiefdom. They variably are built around the need to control environmental resources like fish or soils, the desire to control traded commodities, the need to manage crop surpluses, and the need to organize in defense. Challenges of dealing with steady population increase are also implied if not explicit in some of the current explanations.

Accumulated archaeological evidence may allow us now to propose an alternative or at least improved chain of events leading to the formalization of a Potomac Creek chiefdom. An underlying assumption is that the original Potomac Creek population did, indeed, migrate from well to the north.

Michael Stewart (1994) has closely examined the Late Woodland cultures of the upper Mid-Atlantic and concludes that severe disruptions and hostilities characterized the period between AD 1300 and 1400. He, too, links these fundamentally to the maize shortfalls inflicted by the onset of Little Ice Age. He emphasizes that it was social-political stress induced by environmental change, rather than population increase or a necessity to manage crops, that fostered the development of more sophisticated social systems like simple chiefdoms.

In this vein, it is suspected that Potomac Creek emerged as a small chiefdom after the migration. Clearly, the intention was not to be absorbed as a subordinate society by the native population. Perpetuation of their culture is obvious from material remains, and a willingness to fight for it is apparent from the defensive works. Success would have been the reward of a population organized effectively to construct and maintain public works like palisades, and to organize against challenges from either locals or outside raiders. Aside from these pressing incentives, organization under a paramount chief would have also afforded the usual advantages of diplomatic clout, crop management, and administration of trade.

Prior to this investigation, theories of the site's development were proposed that fall into two categories. One offered by Schmitt (1965:6–8) was inspired in part by ethnohistorical descriptions of fortified sites. What he proposed was at least two phases of construction:

> At first a double stockade with diameters of 175 feet and 240 feet was built and outside this a defensive ditch was constructed encirculing [sic] three quarters of the site. Between the two main palisades were a series of shorter concentric elements arranged in a maze-like fashion. The entrance might have been to the west where the ditch and median stockade break simultaneously. There is an indication of overlappings of the posts composing the inner stockade on the northern and southern sides and final entrance to the village would have been at these points
>
> At some later date the outer stockade was built, devaluating the strategic importance of the ditch and inner stockades. The ditch was then used as a midden for dumping refuse and at least the innermost stockade torn down or allowed to decay. The large ossuary from which Judge Graham obtained the great bulk of the historic material interrupted the inner palisade pattern and is presumably later in time [Schmitt 1965:8].

This interpretation is based on the notion that the site plan expanded over time and that the encircling ditch served an intrinsically defensive role. Curiously, Schmitt does not account for the palisade trenches that lie outside of the ditch. Stewart (1992:36–37) placed even more emphasis on driven-post "stockade" lines, and identified three more substantial ones as the principal enclosures of different periods. The narrow trenches were regarded only as discontinuous, "weaker elements" erected to create a maze-like entry.

Another interpretation tends to equate one enclosure or palisade line with one episode of construction. The CRI report of the first stage of this project, for example, makes this assumption (Outlaw and Tyrer 1996:14). Their suggestion was based on comments by MacCord that construction occurred approximately every 12 years, meaning a minimum occupation span of 150 years.

On a related note, most interpretations of Potomac Creek village development have assumed that it grew outward, and often equate one palisade line with one period in the site's life history. Another interpretation is offered here, key elements of which are that the site did not necessarily expand outward, enclosures can occur in multiples or sets, the ditch was not intrinsically defensive in function, and the site did not always serve as a nucleated village. The three broad stages of this interpretation are described.

STAGE I: UNCOMFORTABLE IMMIGRANTS (CA. AD 1300–1400)

This stage corresponds to the initial occupation, we propose, by the immigrant group. Radiocarbon dates indicate arrival around AD 1300. Protection for the residents was clearly a concern at this time, and is one that likely reflects residual concerns from their homeland as well as uncertain relations with local groups. The frequency of fortified sites increases markedly to the north at about the same time and is taken as a sign of widespread conflict and disruptions (Snow 1994a, 1995, 1997). It was during this stage that the site most likely served as a nucleated and defended community for the newly arrived group. Burial of the dead may have occurred mostly outside of the palisaded area at this time.

The sister site of Moyaone (18PR8) may have been settled at about the same time as 44ST2. A roughly similar sequence of stages can be discerned from the site plan (Stephenson et al. 1963) (Figure 37 and 38). The outermost system is the only one to include an interior ditch/borrow pits, as is the case at Potomac Creek. Bastions are not evident in the Moyaone plan, but excavation procedures and limits might have left them undocumented.

A pair of well-populated villages could have sustained a reproducible population. Using crude estimates, applied to Owasco/Iroquoian villages, of approximately 20 m^2/person (Snow 1994a:30), the maximum number that could comfortably reside within the full interior of 44ST2 (i.e., during Phase 1) is roughly 250–300 persons. These same calculations give a maximum population for Moyaone of 300–320 (approximately 6,100 m^2). This can roughly translate into an initial "founding population" of over 500, divided between at least two nucleated, fortified villages.

Probably the earliest enclosures associated with this stage at 44ST2 are the outermost palisade lines, represented in the project area by the Feature 11 palisade trench, the line of driven posts adjacent to the Feature 11 trench, and possibly the Feature 9 palisade trench (Figure 39) (see Figure 11). Judging from Stewart's site plan, these features extend more or less continuously around the entire perimeter (see Figure 4). Bastions are clearly more numerous along this outer perimeter and may occur only in association with it. Feature 21 in the project area is an example of a bastion footprint formed by a narrow trench. No less than six and possibly seven whole or partial bastion plans are evident in Stewart's plan (see Figure 4). All of them appear at the north, west, and east sides of the site. Whether these towers were considered unnecessary along the sheer bluff to the south is not clear since excavation on that segment is minimal.

At this and later phases, the palisade lines are believed to have occurred in sets to form a more imposing barrier and to create complex entryways. The exact number and configuration of the palisade lines is not clear except in well-documented segments. Overlapping trench and driven-post lines in this outer perimeter are the most confusing. There are no less than six palisades of different types near the outer perimeter, beyond the ditch feature. At least two of these (Feature 11 and the adjacent driven-post line) and possibly a third (Feature 9) are viewed as units of the same enclosure system. Ethnohistorical accounts have been helpful in establishing that complex fortification systems were constructed by area natives. Examples are as follows:

> Their Fortifications consist only of a Palisado of about ten or twelve foot high, and when they would make themselves very safe they ***treble the pale*** [emphasis added]. They often encompass the whole town...[Beverley 1947:149].
>
> They conducted us to their pallizadoed town, mantelled with the barkes of trees, with Scaffolds like mounts, brested about with Barks very formally [Smith 1986b].

Multiple palisade lines are also well known at contemporary sites to the north and west (Snow 1994a).

The site area was at its maximum at this time, with an outside diameter of about 85 m and an interior space of about 5,675 m^2. These dimensions compare favorably with other fortified sites known to enclose an entire community.

Reconstruction or replacement of the first enclosure probably occurred in about the same location. In the project area, remodeling may be represented by the Feature 10 and 27 palisade trenches and the driven-post palisade immediately adjacent to Feature 10. Bastions may not be a part of these later barriers at all, but, if they are, they are less numerous. In this interpretation, the site would still have served as a nucleated community.

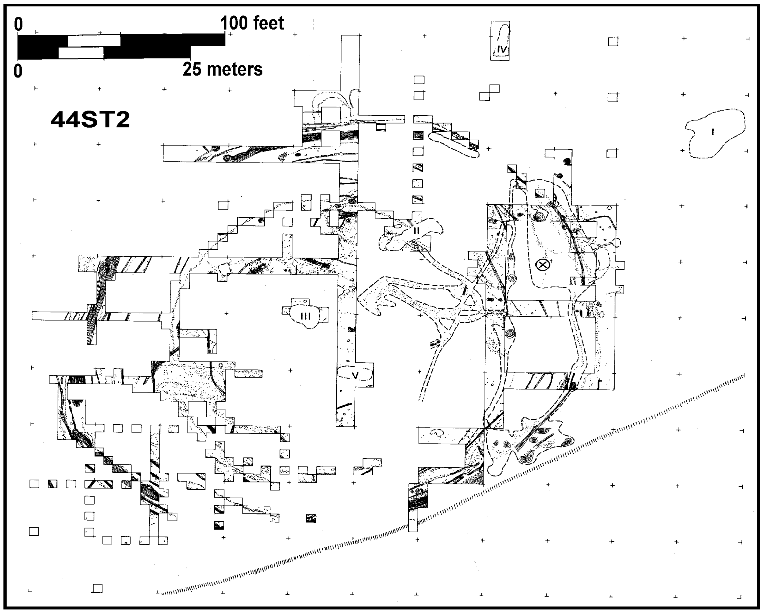


Figure 37. Comparative site plans (Stephenson et al. 1963; Stewart 1992).

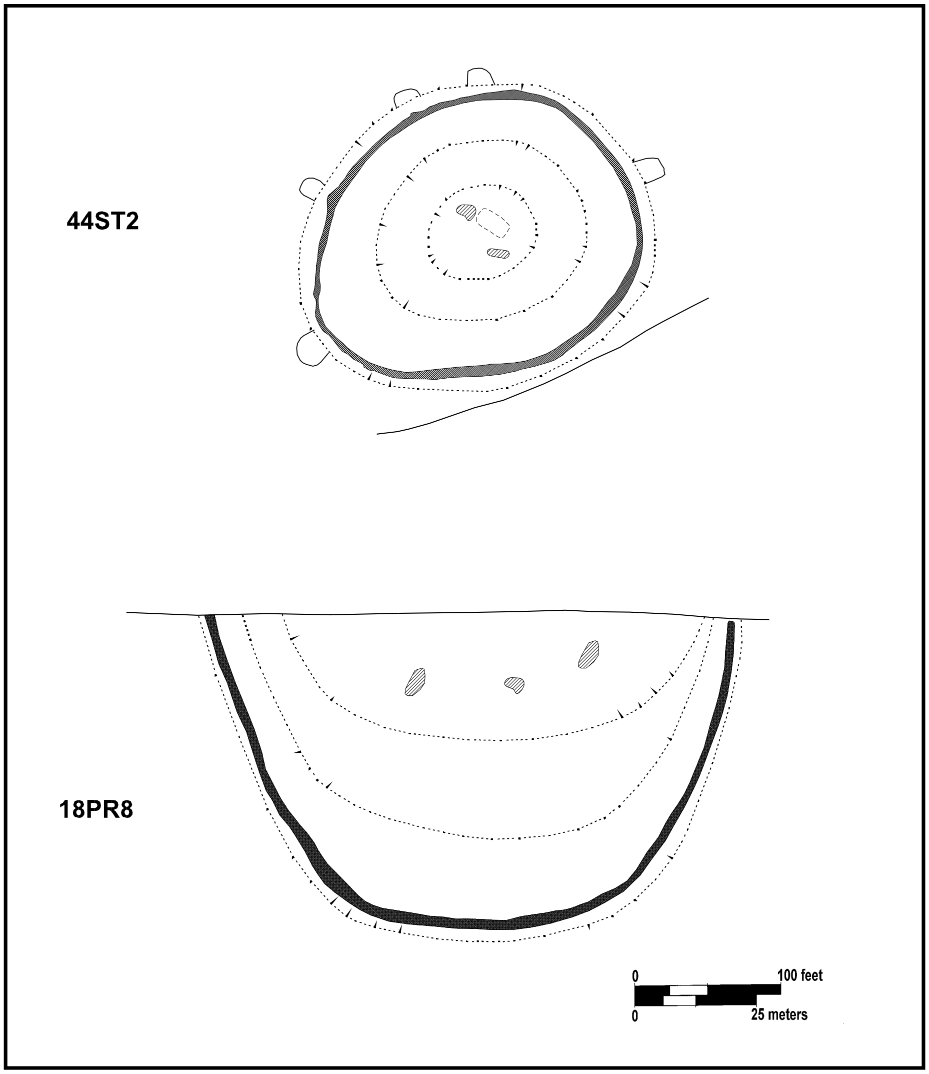


Figure 38. Sites 44ST2 and 18PR8, idealized plans showing major enclosures.

Construction of the encircling ditch was begun and probably finished in this stage. Feature 15 is a large, elongated basin that intruded upon the earlier Feature 9 palisade trench. A broken line of such pits or basins arranged in a circle around the settlement are documented at other sites of the period. Examples include the Winslow and Fisher Montgomery Focus sites (Slattery and Woodward 1992), and the Moyaone (Stephenson et al. 1963) and Cumberland (Williams 1983) sites. Feature 15 may be a vestige of this kind of feature. The placement of the ditch relative to palisades is made clear through comparisons with other sites where it clearly was interior, such as the related site of Moyaone (18PR8), and also at Cumberland (18CV171) (see Figures 37 and 38). As noted, these are among the sites where this kind of feature appears more as an encircling line of pits rather than a continuous ditch. (Whether this represents the effect of plow truncation after which only deeper sections are preserved is uncertain.) It is interesting to note that the ditch feature at Moyaone is also associated with the outermost group of barriers. The function of the ditch is believed to have been originally as a borrow pit for soil banked against the interior palisade wall for support, after which it became a convenient dump for refuse. Perhaps the original pits became linked as the palisades

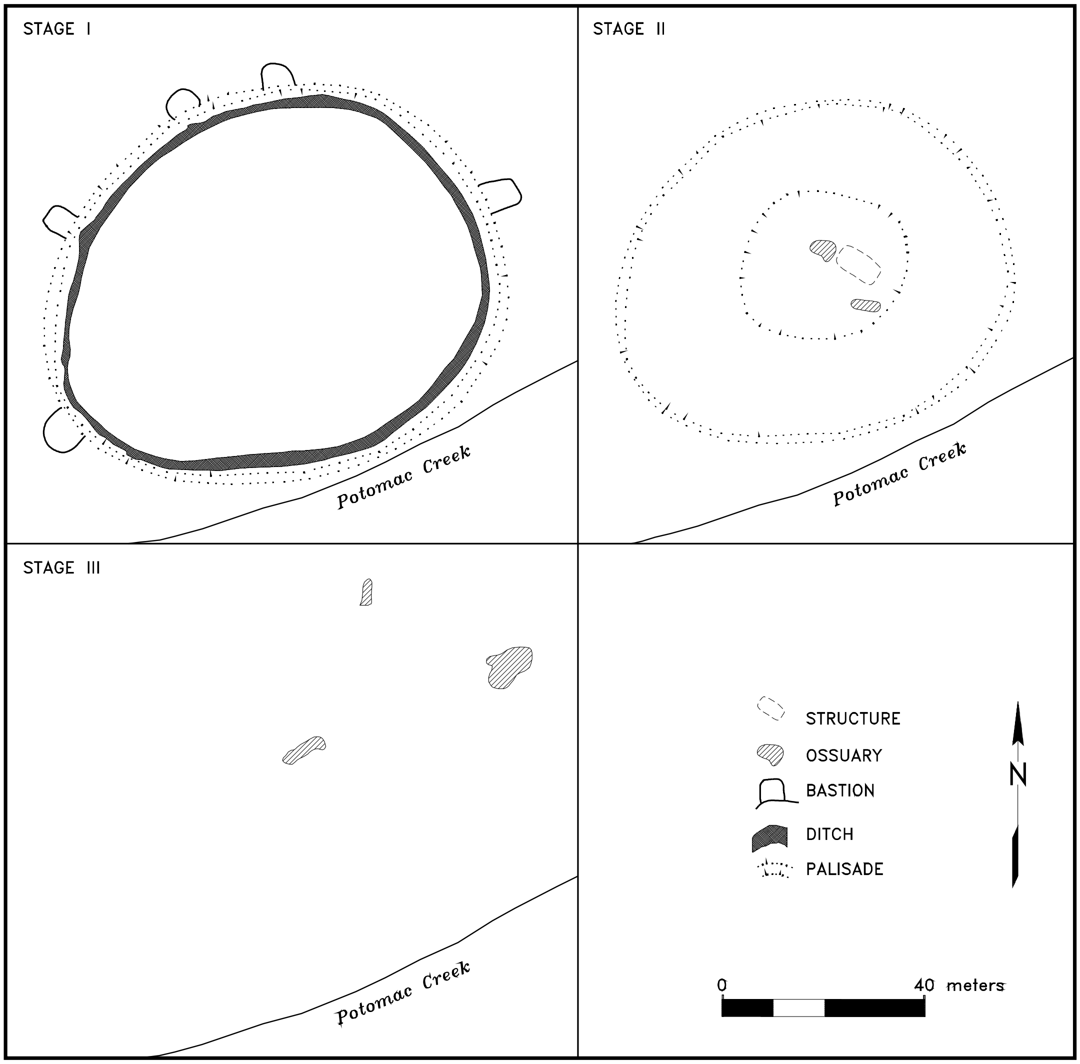


Figure 39. Schematic diagram of village evolution.

were maintained and strengthened with more soil. The report of Bushnell (1935) of a circular embankment at Site 44ST3 may identify a well-preserved example of this kind of feature. Similar features are also reported for Owasco sites in New York (Snow 1995:66).

The culmination of this stage was completion of the ditch or, more properly, maximum reinforcement of the interior palisade with an earthen embankment. The Feature 8 line of driven posts is possibly the innermost barrier of this system. After this phase the site began to gradually contract in size.

STAGE II: A FLOURISHING TIDEWATER CULTURE (CA. AD 1400–1560)

This stage represents the period during which the former immigrant population comfortably established itself in the tidewater reaches of the Potomac drainage and asserted its influence in the region. The size of the enclosed space decreased, and the defensive character of the enclosure system was minimal (see Figure 39). Through this stage, there is increasing evidence that the site assumed an increasingly specialized function and did not serve as the residence for most of the population.

The outermost features marking this stage are palisade trench Features 5–7 (see Figure 11). The driven-post palisade line designated Feature 8 might represent the outermost barrier in this system. This inward shift of the enclosures left the ditch outside of the site proper, where it still could have served for refuse disposal. The lack of bastions and ditch/embankment reinforcement probably signal a distinct relaxation of defensive concerns. At this time the maximum diameter of the enclosed space decreased to 74 m, or an overall interior space of 4,300 m^2.

The building designated Structure 1 is suggested to date from early in this stage. If so, it would have been placed very near the inner palisade, at the perimeter of the enclosed space. Ossuary II on Stewart's (1992) site plan lies just southeast of this structure and may also date to this phase, but whether it intruded upon the later palisade (Feature 2), or vice-versa, is not clear (see Figure 4). If it does not, then it is likely that burials continued to be placed outside the palisades.

Features 3 and 4 palisade trenches and the Feature 2 driven-post line comprise a second portion of this system (see Figure 11). More than likely by this time, a significant portion of the community population was residing in a dispersed settlement outside of the enclosed area at 44ST2.

Other structures probably associated with this stage (or prior Phase 4) are shown on Stewart's plan. The most obvious is south of the project area on the west side of the site (see Figure 4). As Schmitt (1965) and Stewart noted, it appears to be incorporated in what is referred to here as the Feature 2 palisade line. Also, pit Feature 12 is interpreted as associated with this phase of construction. Recall, too, that it is the pit feature returning the latest radiocarbon date (ca. AD 1560).

Other features associated with this stage lie toward the center of the site and were not encountered within the project area discussed here. Stewart's (1992) plan, however, provides sufficient information to consider them in this discussion. These are a palisade trench, and possibly also by the Feature 2 line. (The apparent intrusion of the inner palisade into the western post building described under Phase 5 is evidence of its later date.) These inner enclosures define the smallest space. The maximum diameter of the inner trench is 33 m, defining an interior space of about 855 m^2.

Stewart's (1992) plan depicts a post building located at the precise center of the site (see Figure 4), that is believed to be the principal building associated with this stage. Ossuaries III and V immediately adjacent to this structure are also interpreted as part of this period of use.

This stage represents the culmination of the trend toward specialized function and, concomitantly, decreasing site area. The central structure is a possible mortuary building or chiefly residence. The inclusion of ossuaries within this space underscores the specialized function of the area. (These ossuaries contained no European items and, thus, appear to be prehistoric interments.) It is probably no coincidence that ossuaries are shown only within the innermost enclosure system at Moyaone, as well (see Figure 37). Beverley's (1947[1705]) comments offer some sense of these kinds of enclosed spaces:

> They often encompass their whole town; but for the most part only their King's Houses, and as many others as they judge sufficient to harbor all their people, when an enemy comes against them. They never fail to secure with their Palisado, all their religioius reliques and remains of their Princes.

This level of site specialization may be one of the more obvious indicators of achievement of chiefdom-level organization in eastern Virginia.

STAGE III: MATURITY AND CHANGE (CA. AD 1560–1650)

The outset of this stage was marked by abandonment of 44ST2 in favor of a location on the point nearby to the southwest, known now as 44ST1. Specialized use of the ancestral site continued through the early historic period.

Use of 44ST2 at this time was no longer for general or specialized habitation. Instead, it was used for ossuary burial (see Figure 39). Ossuaries I and IV (see Figure 4) date from this time, as indicated by an abundance of traded European goods with the burials.

To summarize, the Potomac Creek experience may not be far different in its development from what might be expected of immigrant, colonizing groups elsewhere. This is also meant to include even the early experience of the English in the New World. An initial period of highly nucleated settlement in a defensive posture, followed by a period of expansion and stability, and closing with abandonment of formerly significant sites and even disintegration or assimilation are common to both. The archaeological detection of migration and the influences it has on dominant and subordinate societies can be a deceptively complex process, and has only recently reemerged as a credible consideration among archaeologists (Snow 1995, 1997). It is, however, an area ripe for study, and the Potomac Creek case is probably one of the better candidates to investigate.

MATERIAL CULTURE

CERAMIC ARTIFACTS

Ceramic sherds were abundant in excavated feature fill. The total sample of 6,946 sherds was sorted by size and all sherds >2.5 cm were subjected to intensive analysis. Within this subsample, 212 separate vessels were identified from rims and decorated sherds.

It was no surprise that the great majority of the sherds conform to one of three recognized Potomac Creek ware types. In order of frequency they are Potomac Creek Cord-Marked, Plain (smoothed), and Sand-Tempered (Moyaone). Other Late Woodland types are present but as a distinct minority, altogether representing only 4.1% of the total. They include, from most to least common, Page Cord-Marked, Townsend, an unidentified micaceous type, Keyser Cord-Marked, and Gaston Simple-Stamped. These findings are consistent with other appraisals of the 44ST2 ceramic assemblage.

The ceramic artifacts do inform on aspects of the Late Woodland occupation aside from its timing and identity. This and other samples from the site strongly indicate that no appreciable Woodland Stage occupation occurred prior to the Potomac Creek settlement. No Early Woodland sherds and only occasional Middle Woodland sherds are present. This is also true for the Late Woodland before about AD 1300. The few Townsend ware sherds (n=19) are believed to have been introduced during the Potomac Creek occupation, rather than debris from a prior occupation. The same holds true for the other, minority Late Woodland ceramics in the assemblage.

More than anything, the minority Late Woodland ceramic types reveal the extent and direction of Potomac Creek interactions. They disclose low level contact with populations both to the west and east. The

Piedmont-Appalachian connection appears to have been strongest, as measured crudely by numbers of sherds. Types indicative of this orientation are Keyser, Page, and the micaceous examples. More localized but extra-group associations are signified by the Townsend sherds, a culture known to have resided to the east and south at the same time. Relations with groups to the north and south appear from the ceramic evidence to have been limited, at best. The only such clue is a single Gaston sherd, typical of sixteenth and early seventeenth century sites along the James and Appomattox rivers near the Fall Line, well to the south. Given the apparent history of conflict in the north that preceded Potomac Creek arrival on the lower Potomac, it should not be surprising that there is little evidence of interactions in that direction.

Characteristics of cordage can be culturally specific, and archaeologists in the eastern U.S. have begun to examine the twist direction of cordage as a means of testing cultural linkages (Johnson and Speedy 1992; Peterson 1996). Most often, this is based on the negative impressions of cordage left on the surfaces of ceramic vessels. Johnson's examination of a sample of cordage impressions on the 44ST2 sherds establishes a dominance of Z-twist cordage on Potomac Creek surface finishes and decoration (see Appendix E). Elsewhere in the region, Z-twist cordage predominates, including on Late Woodland Townsend, Shepard, Shenks Ferry, and Monongahela wares (Johnson, personal communication 1998). Cord impressions on vessel bodies show a remarkably high frequency of Z-twist cordage (96%), while cord decoration includes about 12% S-twist cordage. It is notable that the finishes of two shell-tempered sherds from the site (one Keyser and one Rappahannock) both exhibit S-twist cordage. This latter fact hints of culture-specific cordage patterns that may serve to reinforce evidence drawn from other ceramic vessel attributes. Johnson comments that further analysis of Potomac Creek assemblages may reveal inter-site distinctions, as well.

Ceramic studies in the region have long emphasized culture history and taxonomy, at the expense of other profitable avenues like functional analysis. Exhaustive functional analysis is beyond the scope of this project but from the outset it was decided to at least explore the potential in a Potomac Creek assemblage. Two features of vessel fragments were isolated as the basis for this investigation: vessel form and residues from use.

Of the four basic vessel forms recognized, jars (83%) are by far the most common, followed in frequency by miniature vessels (9%) and bowls (7%) in similar proportions, and then by beakers (3%). Jar forms with their constricted necks are commonly regarded as vessels for storing liquids, but they can also be useful in cooking. Tabulation of residue, which is primarily accumulation of soot from open fires, clearly shows that jars were primarily cooking vessels. These are the vessels that tend to have cord-marked surfaces and grit tempering. The latter is probably a technological refinement to prepare these vessels to withstand the thermal stresses from this kind of use, rather than merely a learned cultural trait. A plot of rim diameters shows that jars tend to be the largest vessels in use. Most have orifice diameters between 20–30 cm but another, less common group is even larger (30–40 cm). Future study may discern the purposes of graduated jar sizes. Beakers (n=5) are not common but share many of the characteristics of form, temper, and use as jars.

Bowls tend to be smaller than jars, with most having orifice diameters of less than 20 cm, but not smaller than 15 cm. More often than not, bowls do not exhibit residues, especially the heavy accumulations common to jars, and are plain as often as they are cord-marked. The openness of the bowl form and relative lack of sooting, is highly suggestive of use for serving or, perhaps, preparing food. Also, the fact that nearly 50% of all bowls are untempered indicates that they were not always designed to withstand thermal stress as were jars.

Schmitt (1965) and Stephenson et al. (1963) commented decades ago on the common occurrence of miniature vessels in Potomac Creek village assemblages. The number of miniature vessels is also striking in the present sample from 44ST2 (n=14), two of which were recovered intact from Feature 1. In every case they have plain surfaces and are untempered, and they show no accumulations of residue. They show a range of forms that include jars, bowls, and ladles, and always are less than 10 cm in diameter. The function of these vessels is still unclear, although the temptation is strong to regard them as highly specialized. It may be more realistic, however, to consider them ordinary, although uncommon vessel types, potentially functioning as cups. They might also simply be child-size vessels duplicating the array in standard use in a household.

A final note is the rather striking similarity between plain wares (Moyaone) in this assemblage and so-called Colonowares common to eighteenth century sites in eastern Virginia, and also between the finely "rouletted," decorated pipes from 44ST2 and those from later seventeenth century pipes common to English "plantations." The significance of this note is that it contributes to the debate that rages over the origins of these two artifact types in historic period assemblages—enslaved Africans, Native Americans, or both? The presence of them both in this confirmed late prehistoric, Native American context, does speak strongly for an origin in that tradition.

LITHIC, BONE, AND SHELL ARTIFACTS

The lithic assemblage is consistent with material recovered from prior work, especially the predominance of small triangular projectile points and the dominance of quartz as a raw material for flaked tools. It is notable that lithic artifacts are a minority in the overall sample, especially given the abundance of animal bone and ceramic sherds.

The source of stone for most tools, especially quartz, was locally available pebbles and cobbles. These are abundant on the nearby shorelines but also erode from bluffs and would have been encountered in the native soil by any digging on the site. The small nodules of quartz were routinely split using bipolar reduction. This is apparent from the number of resultant cores and pitted cobbles that likely served as anvils in the process.

Discoidal, unifacial, steep-angled scrapers, reminiscent of Paleoindian endscrapers, were relatively common. They are usually made of quartz. Such tools are often associated with hide working and may indicate that this was a common activity at the site.

The bone tool industry was well developed, but shell artifacts were scarce. The latter are represented by only two small, disk-shaped beads, aside from a few fossils. An array of bone tools was recovered. The most common are awls of various types, another indication of hide-working. Others appear to be handles for composite tools. Numerous cut and snapped antlers evince production of projectile points from tines, and probably other tools as well.

SUBSISTENCE ECONOMY

Coarse-grained recovery of subsistence remains, along with uncontrollable vagaries of preservation, continue to hamper accurate interpretation of subsistence patterns in the Mid-Atlantic. This is very true of many large village or "macroband" habitations excavated before the advent of flotation recovery (Custer and Griffith 1986:45). The intent of this project was to rectify that shortcoming for the Potomac Creek Site. The results are limited but offer a basis for more authoritative inference.

The faunal sample recovered by this project is impressive, consisting of nearly 10,000 bones, approximately half of which was carefully analyzed. Soil was routinely collected from all features for the purpose of flotation and in the end 20 samples totaling 56 liters of soil were processed. These samples not only yielded ethnobotanical remains but small faunal specimens as well.

The results of ethnobotanical and faunal analyses establish that the residents of 44ST2 exploited a range of native plants and animals for food, but augmented their diet with crops of tropical cultigens. Deer clearly provided the majority of animal protein, with other taxa contributing a relatively small portion. The narrow range in deer age indicates that mature animals were selected in the hunt. The more prominent secondary animal remains are turkey, box turtle, and fish. The overall scarcity of shellfish, fin fish, and birds aside from turkey (e.g., waterfowl) was unexpected given the estuarine setting of the site. There is some evidence from Feature 12, however, that the contribution of fish increased through time.

The ethnobotanical material is dominated by native plant foods. Hickory nut shell is the most common by far, especially thick-walled varieties like mockernut, shagbark, or shellbark. Oak (acorn) and black walnut are present only in minor amounts. Seeds overall are uncommon, including native starchy/oily seed plants, indicating minimal reliance on these formerly crucial staples of the region. A marked scarcity of fleshy fruit seeds was also noted. Tropical cultigens were ubiquitous in the analyzed samples, although they occur only in minimal quantities. Maize is most prevalent but squash and beans also occur. The scarce occurrence of these cultigens is taken as roughly representative of their actual contribution, that is to say a rather modest supplement to the native plant staples. The total absence of deep, cylindrical storage features at 44ST2 may be indirect evidence of this pattern. This appraisal bears testing, however, as processing and taphonomic factors may affect their survival.

The pilot study of phytoliths for subsistence-environmental interpretation shows that the approach has great promise (see Appendix D). Phytoliths were well preserved and present in all samples, although not in abundance. The limited sample tends to support the ethnobotanical findings, namely that maize is present and ubiquitous but not in impressive quantities. As significant is the level of resolution phytoliths bring to feature interpretation and the nature of local floral communities. This sample linked arboreal types closely with palisade-related features and indicated that differential disposal patterns of plant material characterized the pit features. Further application of phytolith analysis is warranted in the region, especially at complex sites, but will provide better results through larger on-site samples judged against off-site controls.

The results from analysis of subsistence remains are not a huge revelation with respect to Late Woodland economy, but they do give concrete support for Potomac Creek patterns that was lacking before. Some aspects of the findings deserve further discussion. One concerns the contribution of tropical cultigens, especially maize, to Late Woodland societies in the surrounding Coastal Plain. Some maintain that poor preservation has biased archaeological recovery and that maize was a more important staple than excavator's reports indicate. Most of this dismissal of archaeological results reflects the sanctity of the seventeenth-century ethnohistorical record for many of the region's researchers, in which corn in great quantity is reported with regularity. The sheer weight of the prehistoric archaeological evidence, however, is very strong and points to only modest reliance on cultigens before the very late prehistoric or post-contact periods. Indeed, stable isotope assays of human remains from Late Woodland burials in Virginia attest to modest consumption rates for maize (Trimble 1996).

Why estuarine resources are not more prominent in the faunal assemblage is curious. Traditionally, meaning among longstanding resident populations of the area like Townsend, estuarine resources were consumed in abundance (Custer and Griffith 1986:45–49; Potter 1993). This is especially true of shellfish like oysters and clams even in relatively interior estuarine sites and presumably would also include fin fish. If we accept that the initial Potomac Creek colonists originated in the Piedmont, then they were probably anything but preadapted to take advantage of all the estuary's bounty. Learning to collect shellfish and fish might have taken time to learn. That the latest feature excavated in this project area contains the highest proportion of fish remains may support this suggestion. There may be a seasonal element to this pattern in the sense that shellfish and fin fish alike may have been most intensively collected from other sites at specific times of the year. The numbers of small Potomac Creek sites known to occur in the area, including small shell midden sites downstream, is suggestive of a degree of seasonal fissioning. If initial processing of aquatic foods occurred on these sites, or if they were prepared and consumed there, little trace of this pattern would exist on other sites, including some of the larger ones like 44ST2.

It can be further suggested that it was Potomac Creek or related people that promoted stronger commitments to tropical cultigens among the resident groups like Townsend. Custer and Griffith (1986:46–47), for example, contend that the archaeological evidence from Townsend (Slaughter Creek) complex sites supports an economy reliant exclusively on native plant and animal resources. The key plant food staples are hickory and seeds from chenopodium and amaranth. Maize has only been noted from one prehistoric Townsend site excavated in the 1950s, but by the contact period maize was reported frequently from the Delmarva area.

POTOMAC CREEK ORIGINS

There is little serious challenge to the view of Potomac Creek as a foreign culture relocated to the lower Potomac basin. The place of origin for this immigrant population and the impetus for the migration do not enjoy consensus, and are issues yet to be satisfactorily explained. Potter (1993) clearly outlines three competing origin theories (see Chapter 2) and explains why the Montgomery Complex theory is the leading candidate (Figure 40). The findings of the project reported here and others elsewhere can be marshaled to challenge even the Montgomery origin. That the elements of this theory are less than compelling indicates that other possibilities deserve examination. Resolving this issue is well beyond the scope of this effort but the opportunity to contribute ideas is taken.

Schmitt's perceptive suggestion of an Owasco-Potomac Creek connection has not been acted on seriously since it was offered up over 40 years ago. I believe that more expansive and sound interpretation of the Potomac Creek record is at hand, following his lead. The interpretation I am referring to is accommodated by what my Mid-Atlantic colleague Michael Stewart (1994) refers to as a "world system" perspective. Here, this simply challenges us to look fully to the horizon of the Mid-Atlantic Late Woodland world, especially in seeking explanations for a cultural unconformity of the magnitude of Potomac Creek.

We favor a migration-based explanation, as do others, but suggest a more distant place of origin, namely the proto-Iroquoian Owasco cultures of the upper Susquehanna River in New York and Pennsylvania, as Schmitt implied. Parallels in the Potomac Creek and Owasco records exemplify the strength of the connection. More than once, students of Potomac Creek archaeology have noted that similarities between Potomac Creek and Owasco ceramics are stronger than any others, meaning stronger than Shepard types of the Montgomery complex (Kavanaugh 1982; Schmitt 1965). Decorative treatment is most comparable, as cord and cord-wrapped impression are common to both (Table 31). In neither case are thickened/folded rims typical or common, as they are in Montgomery assemblages.

Features of village plan/architecture are also consistent. Notable is the tendency for both to have palisaded villages by the late thirteenth century, while palisades tend not to become prominent elsewhere in

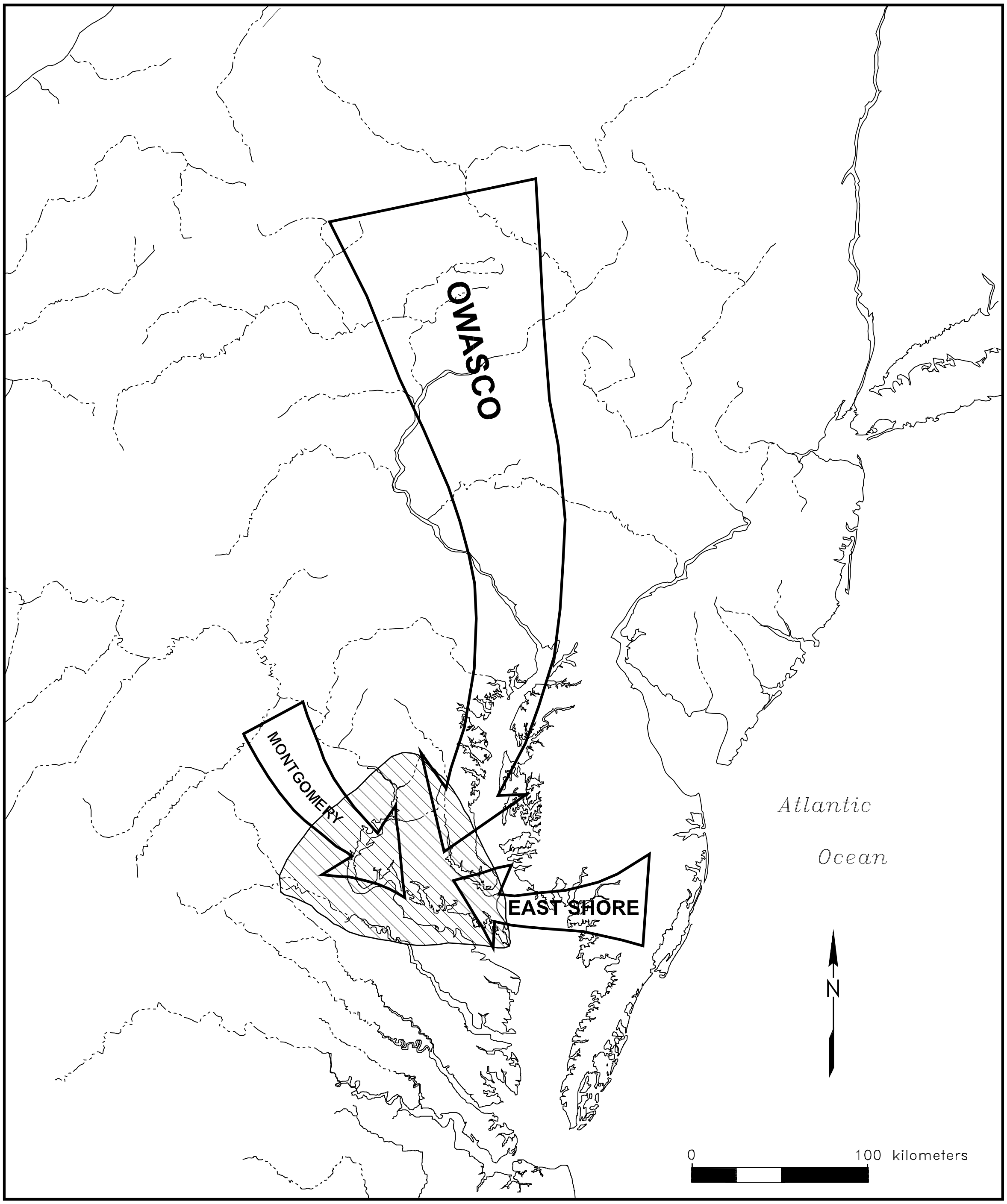


Figure 40. Competing origin hypotheses for Potomac Creek culture.

Attributes	Potomac Creek	Late Owasco	Montgomery	Shenks Ferry (Blue Rock)
Surface Treatment				
Cord Marking	Common	Common	Very common	Very common
Smoothing	Common	Unknown	Unknown	Unknown
Plain	Relatively common	Unknown	Very rare	Unknown
Decoration				
Cord impression	Common	Common	Absent	Absent
Cord-wrapped	Common	Common	Common	Common
Incising	Very rare	Rare	Relatively common	Very common
Slashes	Very rare	Very rare	Relatively common	Relatively common
Rim Form				
Collared/Thickened	Rare	Very rare	Common	Very common
Direct/Self	Common	Common	Relatively rare	Relatively rare

Table 31. Comparative summary of dominant Late Woodland ceramic vessel attributes.

Virginia until later. The Owasco record is marked by evidence of conflict and population movement at precisely the time Potomac Creek Culture appears along the Potomac (Snow 1994a). A shared feature of the village enclosure systems is encircling ditches and earthen rings. The ditches at Potomac Creek sites are all that remains of these features, but it is not difficult to imagine a raised ring of earthen spoil that had been banked against the interior of adjacent palisades (Snow 1995:66). Also, to have two or even three concurrent palisade lines is typical of late Owasco sites (Snow 1994a:36), but other than the Potomac Creek villages, the pattern is not at all typical in Virginia.

Subsistence patterns at Potomac Creek sites are distinctive, too, given the greater degree tropical cultigens figure into Potomac Creek diet. The neighboring, more indigenous groups on the lower Potomac were not intensive horticulturalists (Custer and Griffith 1986).

The strength of these connections argues strongly for careful scrutiny of this possible origin for Potomac Creek, but what is a reasonable catalyst for the migration? Environmental shifts at this time may partially account for the timing of a move. The close to Owasco in New York and the appearance of Potomac Creek in Virginia coincide with the onset of the Little Ice Age at the end of the thirteenth century (Goudie 1977:122–127). Worldwide, including North America, glacial advances and ice cap expansion occurred from AD 1300 to 1700, and the effect on growing seasons and crop yields was devastating in some areas. Archaeologists in the northeastern United States regard this event as a root catalyst for cultural change, including conflict and population movements (Snow 1994a, 1994c). As the climate became significantly cooler, the growing season would naturally have shortened, and horticultural economies of Owasco and other northeastern groups would have been severely affected, especially viewed against the warmer than normal conditions of the preceding Medieval Optimum or Neo-Atlantic episode (AD 750–1300) (Goudie 1977:119–122). One response to the resultant stress would be out-migration, and movement southward is logical if sustaining a horticultural base was important. Economic stress and resultant competition at a time like this can easily spawn conflict, and an abundance of fortified communities that appears at this time in the northern Mid-Atlantic tells such a tale. Migration is also one option for reducing the threat of conflict.

THE FUTURE

The results of this project have generated refinements in our understanding of Potomac Creek Culture. Most are made possible by advances in archaeological methods and Potomac Creek studies since the earliest work of Graham, Stewart, Schmitt, and Stephenson and Ferguson. Essential contributions over the last 20 years are those of MacCord, Clark, and Potter. This is far from the last word, of course, and suggestions for research hereafter are offered.

1. Additional controlled samples analyzed with sophisticated methods are necessary. Screened systematic artifact recovery, radiocarbon dates, flotation recovery, physical sourcing of ceramics and other artifacts, and thorough ethnobotanical and faunal analyses are all vital to a more accurate understanding of Potomac Creek sites of all kinds.

2. Large-area excavation of Late Woodland sites of all complexes and kinds are crucial. It is only through expansive exposures and multi-feature samples that large and small sites are truly understood. This is not to advocate total excavation of unthreatened sites, but it is an appeal for investigation of sections equaling 25–50% of the total site area.

3. An exhaustive, comparative study of Late Woodland cultures, with an emphasis on complexes to the north and west of the lower Potomac, is lacking. Certainly there are studies of Late Woodland complexes that touch on potential influences from these areas, but they are for the most part superficial. An infinitely better understanding of Potomac Creek origins would result from less provincial treatments that emphasize only nearest-neighbor relations.

4. More intensive study of the effects of the Medieval Optimum-Little Ice Age transition is necessary to integrate environmental factors into the Late Woodland archaeology of the region.

5. Considerably more emphasis on subsistence patterns is overdue, especially plant foods. This should include routine flotation recovery and systematic analysis of large-volume samples. Additional phytolith and palynological studies should also be included as appropriate. Indirect measures of plant food consumption such as stable isotope studies of human remains are also very helpful.

6. Ceramic studies should take the form of sophisticated attribute analyses with the goal of identifying temporally sensitive features. Ceramic studies should also emphasize vessel function through studies of form and residues.

7. Explicit tests of the model presented here are necessary.

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APPENDIX A

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/CLEAN UP	Basal Sherd	Smoothed	Sand Tempered			1
F01/CLEAN UP	Body Sherd	Cord Marked	Sand/Grit Tempered			9
F01/CLEAN UP	Body Sherd	Smoothed	Grit Tempered			1
F01/CLEAN UP	Body Sherd	Smoothed	Sand Tempered			1
F01/CLEAN UP	Body Sherd	Smoothed	Sand/Grit Tempered			7
F01/CLEAN UP	Bone					17
F01/CLEAN UP	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F01/CLEAN UP	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		2
F01/CLEAN UP	Shell					5
				Provenience Total:		44
F01/SEC A						290
F01/SEC A	Biface	Stage 2	Misc./Unident. Fragment	Quartz		2
F01/SEC A	Biface	Stage 3	Complete	Quartz		1
F01/SEC A	Biface	Stage 3	Distal Fragment	Silicified Slate		1
F01/SEC A	Biface	Stage 4	Midsection	Quartz		1
F01/SEC A	Body Sherd	Cord Marked	Sand/Grit Tempered			11
F01/SEC A	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			2
F01/SEC A	Body Sherd	Plain	Sand Tempered			1
F01/SEC A	Body Sherd	Plain/Burnished	Grit Tempered			1
F01/SEC A	Body Sherd	Smoothed	Grit Tempered			1
F01/SEC A	Body Sherd	Smoothed	Grit Tempered			1
F01/SEC A	Body Sherd	Smoothed	Limestone Tempered			2
F01/SEC A	Body Sherd	Smoothed	Limestone/Grit Tempered			1
F01/SEC A	Body Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC A	Body Sherd	Unidentifiable	Sand/Grit Tempered			3
F01/SEC A	Bone					197
F01/SEC A	Core	Bipolar		Quartz		5
F01/SEC A	Core	Core Fragment		Quartz		1
F01/SEC A	Core	Core Fragment		Vitric Tuff		1
F01/SEC A	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		10
F01/SEC A	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		4
F01/SEC A	Debitage	2ndry/Biface Thinning Flake	Noncortical	Diabase		1
F01/SEC A	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		27
F01/SEC A	Debitage	2ndry/Biface Thinning Flake	Noncortical	Slate		1
F01/SEC A	Debitage	Angular, Blocky Frag/Chunks	>75% Cortex	Quartz		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC A	Debitage	Bipolar Flake	>75% Cortex	Quartz		3
F01/SEC A	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		19
F01/SEC A	Debitage	Flake Frag./Shatter	1-74% Cortex	Slate		2
F01/SEC A	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		3
F01/SEC A	Debitage	Flake Frag./Shatter	Noncortical	Orthoquartzite		1
F01/SEC A	Debitage	Flake Frag./Shatter	Noncortical	Quartz		57
F01/SEC A	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		13
F01/SEC A	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		2
F01/SEC A	Debitage	Primary/Reduction Flake	Noncortical	Quartz		2
F01/SEC A	Debitage	Tested Cobble/Nodule	>75% Cortex	Quartz		1
F01/SEC A	Fire-cracked Rock					24
F01/SEC A	Hafted Biface	Savannah River Cluster	Proximal Fragment	Quartzite		1
F01/SEC A	Hafted Biface	Unidentified Type	Distal Fragment	Quartz		1
F01/SEC A	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F01/SEC A	Informal Tool	Utilized Flake	Straight Edge	Quartz		1
F01/SEC A	Misc./Unmodified Stone			Unident. Chert		1
F01/SEC A	Rim Sherd	Cord Marked	Limestone Tempered			1
F01/SEC A	Shell					24
F01/SEC A	Unident. Ceramic					1
				Provenience Total:		725
F01/SEC B						421
F01/SEC B	Basal Sherd	Cord Marked	Angular/crushed Grit Tempered			1
F01/SEC B	Basal Sherd	Cord Marked	Grit Tempered			2
F01/SEC B	Basal Sherd	Cord Marked	Sand/Grit Tempered			3
F01/SEC B	Basal Sherd	Smoothed	Grit Tempered			4
F01/SEC B	Basal Sherd	Smoothed	Sand/Grit Tempered			8
F01/SEC B	Biface	Stage 1	Complete	Quartzite		1
F01/SEC B	Biface	Stage 2	Misc./Unident. Fragment	Quartz		1
F01/SEC B	Biface	Stage 3	Complete	Quartz		1
F01/SEC B	Biface	Stage 3	Misc./Unident. Fragment	Quartz		2
F01/SEC B	Biface	Stage 4	Distal Fragment	Quartz		2
F01/SEC B	Biface	Stage 4	Misc./Unident. Fragment	Quartz		1
F01/SEC B	Body Sherd	Cord Marked	Grit Tempered			35
F01/SEC B	Body Sherd	Cord Marked	Limestone Tempered			2
F01/SEC B	Body Sherd	Cord Marked	Micaceous Sand Tempered			1
F01/SEC B	Body Sherd	Cord Marked	Sand Tempered			1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC B	Body Sherd	Cord Marked	Sand/Grit Tempered			47
F01/SEC B	Body Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC B	Body Sherd	Cord Marked/cord-wrapped Dowel	Grit Tempered			1
F01/SEC B	Body Sherd	Eroded	Grit Tempered			1
F01/SEC B	Body Sherd	Fabric Impressed	Shell Tempered			2
F01/SEC B	Body Sherd	Plain	Angular/crushed Grit Tempered			1
F01/SEC B	Body Sherd	Plain	Untempered			1
F01/SEC B	Body Sherd	Plain/cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F01/SEC B	Body Sherd	Plain/cord-wrapped Dowel	Grit Tempered			1
F01/SEC B	Body Sherd	Plain/cord-wrapped Dowel	Micaceous Sand Tempered			2
F01/SEC B	Body Sherd	Smoothed	Grit Tempered			6
F01/SEC B	Body Sherd	Smoothed	Micaceous Sand Tempered			1
F01/SEC B	Body Sherd	Smoothed	Sand/Grit Tempered			9
F01/SEC B	Body Sherd	Smoothed/Punctate	Limestone Tempered			1
F01/SEC B	Body Sherd	Unidentifiable	Grit Tempered			1
F01/SEC B	Body Sherd	Unidentifiable	Shell Tempered			1
F01/SEC B	Bone					688
F01/SEC B	Core	Bifacial		Quartz		2
F01/SEC B	Core	Bipolar		Quartz		3
F01/SEC B	Core	Random		Quartzite		1
F01/SEC B	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		13
F01/SEC B	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartzite		1
F01/SEC B	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Slate		1
F01/SEC B	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		5
F01/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Orthoquartzite		2
F01/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		53
F01/SEC B	Debitage	Angular, Blocky Frag/Chunks	Noncortical	Quartz		2
F01/SEC B	Debitage	Bipolar Flake	1-74% Cortex	Quartz		9
F01/SEC B	Debitage	Bipolar Flake	>75% Cortex	Quartz		2
F01/SEC B	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		24
F01/SEC B	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartzite		1
F01/SEC B	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		6
F01/SEC B	Debitage	Flake Frag./Shatter	>75% Cortex	Quartzite		1
F01/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartz		66
F01/SEC B	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		19
F01/SEC B	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC B	Debitage	Primary/Reduction Flake	Noncortical	Quartz		1
F01/SEC B	Fire-cracked Rock					25
F01/SEC B	Formal Groundstone	Bowl Fragment		Steatite		1
F01/SEC B	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		2
F01/SEC B	Hafted Biface	Unidentified Type	Distal Fragment	Quartz		1
F01/SEC B	Other Formal Tool	Endscraper		Quartz		3
F01/SEC B	Pipe					2
F01/SEC B	Rim Sherd	Cord Marked	Grit Tempered			5
F01/SEC B	Rim Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC B	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC B	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
F01/SEC B	Rim Sherd	Cord Marked/cord-wrapped Dowel	Grit Tempered			1
F01/SEC B	Rim Sherd	Plain/Cord Impressed	Sand/Grit Tempered			1
F01/SEC B	Rim Sherd	Plain/Cord Impressed	Untempered			1
F01/SEC B	Rim Sherd	Plain/cord-wrapped Dowel	Grit Tempered			1
F01/SEC B	Rim Sherd	Smoothed	Limestone Tempered			1
F01/SEC B	Rim Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC B	Rim Sherd	Smoothed/Cord wrapped Dowel	Sand/Grit Tempered			1
F01/SEC B	Shell					150
				Provenience Total:	1665	
F01/SEC C						34
F01/SEC C	Basal Sherd	Cord Marked	Grit Tempered			1
F01/SEC C	Basal Sherd	Cord Marked	Sand/Grit Tempered			1
F01/SEC C	Biface	Stage 2	Midsection	Slate		1
F01/SEC C	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			1
F01/SEC C	Body Sherd	Cord Marked	Grit Tempered			5
F01/SEC C	Body Sherd	Cord Marked	Sand Tempered			1
F01/SEC C	Body Sherd	Cord Marked	Sand/Grit Tempered			13
F01/SEC C	Body Sherd	Smoothed	Grit Tempered			2
F01/SEC C	Body Sherd	Smoothed	Sand/Grit Tempered			2
F01/SEC C	Bone					64
F01/SEC C	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		1
F01/SEC C	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		1
F01/SEC C	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
F01/SEC C	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartzite		1
F01/SEC C	Fire-cracked Rock					21

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC C	Informal Groundstone	Combination Tool	Complete	Limestone		1
F01/SEC C	Informal Groundstone	Pitted Stone	Complete	Quartzite		1
F01/SEC C	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F01/SEC C	Informal Tool	Utilized Flake	Straight Edge	Quartz		1
F01/SEC C	Misc./Unmodified Stone			Bog Iron		2
F01/SEC C	Pipe					1
F01/SEC C	Rim Sherd	Cord Marked	Sand Tempered			1
F01/SEC C	Rim Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC C	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
F01/SEC C	Rim Sherd	Plain	Untempered			1
F01/SEC C	Shell					16
				Provenience Total:		178
F01/SEC C/D SUR						1
F01/SEC C/D SUR	Basal Sherd	Cord Marked	Sand/Grit Tempered			1
F01/SEC C/D SUR	Body Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC C/D SUR	Body Sherd	Smoothed	Grit Tempered			2
F01/SEC C/D SUR	Unident. Ceramic					1
				Provenience Total:		7
F01/SEC D						312
F01/SEC D	Basal Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC D	Basal Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC D	Basal Sherd	Unidentifiable	Sand/Grit Tempered			1
F01/SEC D	Biface	Stage 1	Complete	Quartz		1
F01/SEC D	Biface	Stage 2	Distal Fragment	Quartz		1
F01/SEC D	Biface	Stage 2	Distal Fragment	Quartz		1
F01/SEC D	Biface	Stage 3	Distal Fragment	Quartz		1
F01/SEC D	Biface	Stage 3	Midsection	Quartz		1
F01/SEC D	Body Sherd	Cord Marked	Grit Tempered			3
F01/SEC D	Body Sherd	Cord Marked	Sand/Grit Tempered			5
F01/SEC D	Body Sherd	Plain	Sand/Grit Tempered			1
F01/SEC D	Body Sherd	Plain/cord-wrapped Dowel	Sand Tempered			1
F01/SEC D	Body Sherd	Smoothed	Angular/crushed Grit Tempered			1
F01/SEC D	Body Sherd	Smoothed	Grit Tempered			1
F01/SEC D	Body Sherd	Unidentifiable	Sand Tempered			2
F01/SEC D	Bone					284
F01/SEC D	Core	Bipolar		Quartz		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC D	Core	Random		Quartz		1
F01/SEC D	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		27
F01/SEC D	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		4
F01/SEC D	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		61
F01/SEC D	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartzite		1
F01/SEC D	Debitage	Bipolar Flake	1-74% Cortex	Quartz		8
F01/SEC D	Debitage	Bipolar Flake	>75% Cortex	Quartz		6
F01/SEC D	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		16
F01/SEC D	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		7
F01/SEC D	Debitage	Flake Frag./Shatter	Noncortical	Chalcedony		1
F01/SEC D	Debitage	Flake Frag./Shatter	Noncortical	Crystalline Quartz		1
F01/SEC D	Debitage	Flake Frag./Shatter	Noncortical	Quartz		85
F01/SEC D	Debitage	Flake Frag./Shatter	Noncortical	Quartzite		1
F01/SEC D	Debitage	Flake Frag./Shatter	Noncortical	Vitric Tuff		1
F01/SEC D	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		8
F01/SEC D	Fire-cracked Rock					27
F01/SEC D	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		1
F01/SEC D	Hafted Biface	Unidentified Type	Distal Fragment	Quartz		1
F01/SEC D	Hafted Biface	Unidentified Type	Misc./Unident. Fragment	Quartz		1
F01/SEC D	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F01/SEC D	Informal Tool	Utilized Flake	Straight Edge	Quartz		1
F01/SEC D	Misc./Unmodified Stone			Bog Iron		2
F01/SEC D	Misc./Unmodified Stone			Limestone		2
F01/SEC D	Pipe					4
F01/SEC D	Shell					13
F01/SEC D	Unident. Ceramic					1
				Provenience Total:	902	
F01/SEC D/CU						8
F01/SEC D/CU	Bone					8
				Provenience Total:	16	
F01/SEC E	Basal Sherd	Cord Marked	Grit Tempered			1
F01/SEC E	Basal Sherd	Cord Marked	Grit Tempered			2
F01/SEC E	Basal Sherd	Cord Marked	Sand Tempered			1
F01/SEC E	Basal Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC E	Basal Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC E	Basal Sherd	Plain	Sand Tempered			1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC E	Basal Sherd	Plain	Sand/Grit Tempered			2
F01/SEC E	Basal Sherd	Plain	Untempered			5
F01/SEC E	Basal Sherd	Plain	Untempered			6
F01/SEC E	Basal Sherd	Smoothed	Grit Tempered			2
F01/SEC E	Basal Sherd	Smoothed	Grit Tempered			4
F01/SEC E	Basal Sherd	Smoothed	Sand/Grit Tempered			2
F01/SEC E	Basal Sherd	Smoothed	Sand/Grit Tempered			7
F01/SEC E	Basal Sherd	Unidentifiable	Grit Tempered			3
F01/SEC E	Basal Sherd	Unidentifiable	Sand/Grit Tempered			1
F01/SEC E	Bead	Plain				1
F01/SEC E	Biface	Stage 1	Complete	Quartz		3
F01/SEC E	Biface	Stage 2	Complete	Quartz		3
F01/SEC E	Biface	Stage 2	Misc./Unident. Fragment	Quartz		1
F01/SEC E	Body Sherd	Cord Impressed	Grit Tempered			3
F01/SEC E	Body Sherd	Cord Impressed	Sand Tempered			3
F01/SEC E	Body Sherd	Cord Impressed	Sand/Grit Tempered			3
F01/SEC E	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			6
F01/SEC E	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			15
F01/SEC E	Body Sherd	Cord Marked	Grit Tempered			75
F01/SEC E	Body Sherd	Cord Marked	Grit Tempered			76
F01/SEC E	Body Sherd	Cord Marked	Limestone/Grit Tempered			2
F01/SEC E	Body Sherd	Cord Marked	Sand Tempered			6
F01/SEC E	Body Sherd	Cord Marked	Sand Tempered			17
F01/SEC E	Body Sherd	Cord Marked	Sand/Grit Tempered			81
F01/SEC E	Body Sherd	Cord Marked	Sand/Grit Tempered			167
F01/SEC E	Body Sherd	Cord Marked	Shell and Grit Tempered			2
F01/SEC E	Body Sherd	Cord Marked	Untempered			1
F01/SEC E	Body Sherd	Cord Marked	Untempered			3
F01/SEC E	Body Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC E	Body Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC E	Body Sherd	Cord Marked/Cord Impressed	Sand Tempered			2
F01/SEC E	Body Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			2
F01/SEC E	Body Sherd	Cord Marked/Punctate	Shell Tempered			1
F01/SEC E	Body Sherd	Cord Marked/cord-wrapped Dowel	Sand Tempered			1
F01/SEC E	Body Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC E	Body Sherd	Cord-wrapped Dowel	Grit Tempered			2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC E	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			6
F01/SEC E	Body Sherd	Eroded	Grit Tempered			6
F01/SEC E	Body Sherd	Eroded	Sand Tempered			7
F01/SEC E	Body Sherd	Eroded	Sand/Grit Tempered			1
F01/SEC E	Body Sherd	Eroded	Sand/Grit Tempered			25
F01/SEC E	Body Sherd	Eroded	Shell Tempered			1
F01/SEC E	Body Sherd	Eroded	Untempered			5
F01/SEC E	Body Sherd	Fabric Impressed	Shell Tempered			2
F01/SEC E	Body Sherd	Fabric Impressed	Shell Tempered			5
F01/SEC E	Body Sherd	Fabric Impressed/Incised	Shell Tempered			3
F01/SEC E	Body Sherd	Plain	Angular/crushed Grit Tempered			4
F01/SEC E	Body Sherd	Plain	Grit Tempered			1
F01/SEC E	Body Sherd	Plain	Micaceous Sand Tempered			3
F01/SEC E	Body Sherd	Plain	Sand Tempered			5
F01/SEC E	Body Sherd	Plain	Sand/Grit Tempered			29
F01/SEC E	Body Sherd	Plain	Shell Tempered			2
F01/SEC E	Body Sherd	Plain	Shell Tempered			2
F01/SEC E	Body Sherd	Plain	Untempered			9
F01/SEC E	Body Sherd	Plain/Burnished	Sand Tempered			1
F01/SEC E	Body Sherd	Plain/Cord Impressed	Sand/Grit Tempered			1
F01/SEC E	Body Sherd	Plain/cord-wrapped Dowel	Micaceous Sand Tempered			1
F01/SEC E	Body Sherd	Plain/cord-wrapped Dowel	Sand Tempered			2
F01/SEC E	Body Sherd	Plain/cord-wrapped Dowel	Sand/Grit Tempered			3
F01/SEC E	Body Sherd	Punctate/Cord wrapped Dowel	Angular/crushed Grit Tempered			1
F01/SEC E	Body Sherd	Smoothed	Angular/crushed Grit Tempered			3
F01/SEC E	Body Sherd	Smoothed	Angular/crushed Grit Tempered			5
F01/SEC E	Body Sherd	Smoothed	Grit Tempered			13
F01/SEC E	Body Sherd	Smoothed	Grit Tempered			33
F01/SEC E	Body Sherd	Smoothed	Limestone/Grit Tempered			1
F01/SEC E	Body Sherd	Smoothed	Sand Tempered			5
F01/SEC E	Body Sherd	Smoothed	Sand/Grit Tempered			20
F01/SEC E	Body Sherd	Smoothed	Sand/Grit Tempered			51
F01/SEC E	Body Sherd	Smoothed	Shell Tempered			2
F01/SEC E	Body Sherd	Smoothed	Shell Tempered			2
F01/SEC E	Body Sherd	Unidentifiable	Angular/crushed Grit Tempered			1
F01/SEC E	Body Sherd	Unidentifiable	Angular/crushed Grit Tempered			2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC E	Body Sherd	Unidentifiable	Grit Tempered			1
F01/SEC E	Body Sherd	Unidentifiable	Grit Tempered			14
F01/SEC E	Body Sherd	Unidentifiable	Limestone/Grit Tempered			2
F01/SEC E	Body Sherd	Unidentifiable	Sand Tempered			14
F01/SEC E	Body Sherd	Unidentifiable	Sand/Grit Tempered			4
F01/SEC E	Body Sherd	Unidentifiable	Sand/Grit Tempered			31
F01/SEC E	Body Sherd	Unidentifiable	Shell Tempered			7
F01/SEC E	Body Sherd	Unidentifiable	Shell and Grit Tempered			1
F01/SEC E	Body Sherd	Unidentifiable	Untempered			9
F01/SEC E	Bone					1666
F01/SEC E	Core	Bipolar		Quartz		2
F01/SEC E	Core	Core Fragment		Orthoquartzite		1
F01/SEC E	Core	Core Fragment		Quartz		1
F01/SEC E	Core	Random		Quartzite		1
F01/SEC E	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		18
F01/SEC E	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		1
F01/SEC E	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		23
F01/SEC E	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartzite		1
F01/SEC E	Debitage	Angular, Blocky Frag/Chunks	>75% Cortex	Quartz		1
F01/SEC E	Debitage	Bipolar Flake	1-74% Cortex	Quartz		12
F01/SEC E	Debitage	Bipolar Flake	>75% Cortex	Quartz		9
F01/SEC E	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		19
F01/SEC E	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		5
F01/SEC E	Debitage	Flake Frag./Shatter	Noncortical	Quartz		42
F01/SEC E	Debitage	Flake Frag./Shatter	Noncortical	Quartzite		2
F01/SEC E	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		16
F01/SEC E	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartzite		1
F01/SEC E	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		1
F01/SEC E	Fire-cracked Rock					76
F01/SEC E	Formal Groundstone	Celt	Distal Fragment	Slate		1
F01/SEC E	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		2
F01/SEC E	Hafted Biface	Unidentified Type	Distal Fragment	Quartz		1
F01/SEC E	Hafted Biface	Unidentified Type	Misc./Unident. Fragment	Quartz		1
F01/SEC E	Informal Groundstone	Hammerstone	Complete	Quartzite		1
F01/SEC E	Informal Groundstone	Pitted Stone	Complete	Quartzite		2
F01/SEC E	Informal Tool	Retouched Flake	Straight Edge	Quartz		2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC E	Informal Tool	Utilized Flake	Straight Edge	Quartz		1
F01/SEC E	Misc./Unmodified Stone			Bog Iron		17
F01/SEC E	Misc./Unmodified Stone			Limestone		3
F01/SEC E	Misc./Unmodified Stone			Slate		2
F01/SEC E	Misc./Unmodified Stone			Unidentified Material		4
F01/SEC E	Other Formal Tool	Endscraper		Quartz		1
F01/SEC E	Pipe					11
F01/SEC E	Rim Sherd	Cord Impressed	Grit Tempered			5
F01/SEC E	Rim Sherd	Cord Impressed	Sand Tempered			1
F01/SEC E	Rim Sherd	Cord Impressed	Sand/Grit Tempered			5
F01/SEC E	Rim Sherd	Cord Impressed	Untempered			1
F01/SEC E	Rim Sherd	Cord Marked	Grit Tempered			1
F01/SEC E	Rim Sherd	Cord Marked	Grit Tempered			2
F01/SEC E	Rim Sherd	Cord Marked	Sand Tempered			2
F01/SEC E	Rim Sherd	Cord Marked	Sand/Grit Tempered			6
F01/SEC E	Rim Sherd	Cord Marked	Sand/Grit Tempered			17
F01/SEC E	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			2
F01/SEC E	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
F01/SEC E	Rim Sherd	Cord Marked/Incised	Sand/Grit Tempered			1
F01/SEC E	Rim Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			2
F01/SEC E	Rim Sherd	Cord-wrapped Dowel	Grit Tempered			1
F01/SEC E	Rim Sherd	Eroded	Grit Tempered			1
F01/SEC E	Rim Sherd	Eroded	Sand/Grit Tempered			1
F01/SEC E	Rim Sherd	Eroded	Untempered			1
F01/SEC E	Rim Sherd	Plain	Angular/crushed Grit Tempered			1
F01/SEC E	Rim Sherd	Plain	Sand/Grit Tempered			1
F01/SEC E	Rim Sherd	Plain	Sand/Grit Tempered			3
F01/SEC E	Rim Sherd	Plain	Untempered			2
F01/SEC E	Rim Sherd	Plain	Untempered			6
F01/SEC E	Rim Sherd	Plain/Punctate	Untempered			1
F01/SEC E	Rim Sherd	Plain/cord-wrapped Dowel	Angular/crushed Grit Tempered			2
F01/SEC E	Rim Sherd	Plain/cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC E	Rim Sherd	Plain/cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC E	Rim Sherd	Smoothed	Grit Tempered			1
F01/SEC E	Rim Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC E	Rim Sherd	Smoothed	Shell Tempered			1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC E	Shell					200
F01/SEC E	Unident. Ceramic					1
F01/SEC E	Unident. Ceramic					1
F01/SEC E	Unident. Ceramic					2
F01/SEC E	Vessel	Plain	Sand/Grit Tempered			1
F01/SEC E	Vessel	Plain	Untempered			1
				Provenience Total:	3090	
F01/SEC F						265
F01/SEC F	Basal Sherd	Cord Marked	Sand/Grit Tempered			1
F01/SEC F	Basal Sherd	Cord Marked	Untempered			1
F01/SEC F	Basal Sherd	Plain	Untempered			1
F01/SEC F	Basal Sherd	Smoothed	Grit Tempered			1
F01/SEC F	Biface	Stage 1	Misc./Unident. Fragment	Quartz		1
F01/SEC F	Biface	Stage 2	Misc./Unident. Fragment	Quartz		3
F01/SEC F	Biface	Stage 2	Misc./Unident. Fragment	Quartzite		1
F01/SEC F	Biface	Stage 3	Complete	Quartz		1
F01/SEC F	Biface	Stage 3	Distal Fragment	Quartz		1
F01/SEC F	Biface	Stage 3	Misc./Unident. Fragment	Quartz		3
F01/SEC F	Biface	Stage 4	Distal Fragment	Quartz		1
F01/SEC F	Biface	Stage 4	Midsection	Quartz		1
F01/SEC F	Body Sherd	Cord Marked	Grit Tempered			7
F01/SEC F	Body Sherd	Cord Marked	Micaceous Sand Tempered			1
F01/SEC F	Body Sherd	Cord Marked	Sand Tempered			2
F01/SEC F	Body Sherd	Cord Marked	Sand/Grit Tempered			10
F01/SEC F	Body Sherd	Fabric Impressed	Shell Tempered			1
F01/SEC F	Body Sherd	Smoothed	Grit Tempered			2
F01/SEC F	Body Sherd	Smoothed	Limestone/Grit Tempered			1
F01/SEC F	Body Sherd	Smoothed	Sand Tempered			2
F01/SEC F	Body Sherd	Smoothed	Sand/Grit Tempered			6
F01/SEC F	Body Sherd	Smoothed/Punctate	Sand/Grit Tempered			1
F01/SEC F	Bone					186
F01/SEC F	Core	Bipolar		Quartz		1
F01/SEC F	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Crystalline Quartz		2
F01/SEC F	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		20
F01/SEC F	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		7
F01/SEC F	Debitage	2ndry/Biface Thinning Flake	Noncortical	Crystalline Quartz		2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC F	Debitage	2ndry/Biface Thinning Flake	Noncortical	Jasper		1
F01/SEC F	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		37
F01/SEC F	Debitage	Bipolar Flake	1-74% Cortex	Quartz		7
F01/SEC F	Debitage	Bipolar Flake	>75% Cortex	Quartz		3
F01/SEC F	Debitage	Flake Frag./Shatter	1-74% Cortex	Crystalline Quartz		1
F01/SEC F	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		23
F01/SEC F	Debitage	Flake Frag./Shatter	1-74% Cortex	Unident. Chert		1
F01/SEC F	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		11
F01/SEC F	Debitage	Flake Frag./Shatter	>75% Cortex	Quartzite		1
F01/SEC F	Debitage	Flake Frag./Shatter	Noncortical	Crystalline Quartz		1
F01/SEC F	Debitage	Flake Frag./Shatter	Noncortical	Orthoquartzite		1
F01/SEC F	Debitage	Flake Frag./Shatter	Noncortical	Quartz		48
F01/SEC F	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		18
F01/SEC F	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		2
F01/SEC F	Debitage	Primary/Reduction Flake	>75% Cortex	Quartzite		1
F01/SEC F	Debitage	Tested Cobble/Nodule	>75% Cortex	Vitric Tuff		1
F01/SEC F	Fire-cracked Rock					55
F01/SEC F	Formal Groundstone	Bowl Fragment		Steatite		1
F01/SEC F	Hafted Biface	Small Triangular Cluster	Complete	Quartz		2
F01/SEC F	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		2
F01/SEC F	Hafted Biface	Unidentified Type	Midsection	Quartz		1
F01/SEC F	Hafted Biface	Unidentified Type	Misc./Unident. Fragment	Quartz		1
F01/SEC F	Informal Groundstone	Other Form		Sandstone		1
F01/SEC F	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F01/SEC F	Informal Tool	Utilized Flake	Straight Edge	Quartz		2
F01/SEC F	Informal Tool	Utilized Flake	Straight Edge	Vitric Tuff		1
F01/SEC F	Misc./Unmodified Stone			Bog Iron		7
F01/SEC F	Misc./Unmodified Stone			Limestone		1
F01/SEC F	Pipe					4
F01/SEC F	Rim Sherd	Cord Marked	Grit Tempered			1
F01/SEC F	Shell					49
				Provenience Total:	818	
F01/SEC G	Basal Sherd	Cord Marked	Grit Tempered			1
F01/SEC G	Basal Sherd	Cord Marked	Grit Tempered			3
F01/SEC G	Basal Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC G	Basal Sherd	Cord Marked	Sand/Grit Tempered			6

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC G	Basal Sherd	Plain	Angular/crushed Grit Tempered			1
F01/SEC G	Basal Sherd	Plain	Sand Tempered			2
F01/SEC G	Basal Sherd	Plain	Sand/Grit Tempered			2
F01/SEC G	Basal Sherd	Plain	Untempered			1
F01/SEC G	Basal Sherd	Plain	Untempered			7
F01/SEC G	Basal Sherd	Smoothed	Grit Tempered			3
F01/SEC G	Basal Sherd	Smoothed	Sand/Grit Tempered			2
F01/SEC G	Basal Sherd	Smoothed	Sand/Grit Tempered			7
F01/SEC G	Basal Sherd	Unidentifiable	Grit Tempered			2
F01/SEC G	Basal Sherd	Unidentifiable	Untempered			1
F01/SEC G	Bead	Plain				1
F01/SEC G	Biface	Stage 1	Complete	Quartzite		1
F01/SEC G	Biface	Stage 2	Misc./Unident. Fragment	Quartz		3
F01/SEC G	Biface	Stage 3	Complete	Quartz		1
F01/SEC G	Biface	Stage 3	Distal Fragment	Quartz		1
F01/SEC G	Biface	Stage 3	Misc./Unident. Fragment	Quartz		1
F01/SEC G	Biface	Stage 4	Distal Fragment	Quartz		1
F01/SEC G	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			4
F01/SEC G	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			6
F01/SEC G	Body Sherd	Cord Marked	Grit Tempered			32
F01/SEC G	Body Sherd	Cord Marked	Grit Tempered			37
F01/SEC G	Body Sherd	Cord Marked	Limestone Tempered			2
F01/SEC G	Body Sherd	Cord Marked	Limestone/Grit Tempered			4
F01/SEC G	Body Sherd	Cord Marked	Limestone/Grit Tempered			5
F01/SEC G	Body Sherd	Cord Marked	Sand Tempered			3
F01/SEC G	Body Sherd	Cord Marked	Sand Tempered			5
F01/SEC G	Body Sherd	Cord Marked	Sand/Grit Tempered			33
F01/SEC G	Body Sherd	Cord Marked	Sand/Grit Tempered			117
F01/SEC G	Body Sherd	Cord Marked	Shell Tempered			2
F01/SEC G	Body Sherd	Cord Marked	Shell and Grit Tempered			1
F01/SEC G	Body Sherd	Cord Marked	Untempered			1
F01/SEC G	Body Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC G	Body Sherd	Cord Marked/Cord Impressed	Micaceous Sand Tempered			1
F01/SEC G	Body Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
F01/SEC G	Body Sherd	Cord Marked/cord-wrapped Dowel	Grit Tempered			1
F01/SEC G	Body Sherd	Cord-wrapped Dowel	Angular/crushed Grit Tempered			1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC G	Body Sherd	Cord-wrapped Dowel	Angular/crushed Grit Tempered			4
F01/SEC G	Body Sherd	Cord-wrapped Dowel	Sand Tempered			1
F01/SEC G	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC G	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC G	Body Sherd	Eroded	Grit Tempered			9
F01/SEC G	Body Sherd	Eroded	Sand Tempered			3
F01/SEC G	Body Sherd	Eroded	Untempered			5
F01/SEC G	Body Sherd	Fabric Impressed	Shell Tempered			4
F01/SEC G	Body Sherd	Plain	Sand/Grit Tempered			13
F01/SEC G	Body Sherd	Plain	Untempered			2
F01/SEC G	Body Sherd	Plain	Untempered			7
F01/SEC G	Body Sherd	Plain/Cord Impressed	Untempered			1
F01/SEC G	Body Sherd	Plain/Punctate	Untempered			1
F01/SEC G	Body Sherd	Plain/cord-wrapped Dowel	Grit Tempered			1
F01/SEC G	Body Sherd	Plain/cord-wrapped Dowel	Sand/Grit Tempered			2
F01/SEC G	Body Sherd	Punctate	Sand/Grit Tempered			1
F01/SEC G	Body Sherd	Punctate/Cord wrapped Dowel	Limestone/Grit Tempered			1
F01/SEC G	Body Sherd	Smoothed	Angular/crushed Grit Tempered			4
F01/SEC G	Body Sherd	Smoothed	Grit Tempered			16
F01/SEC G	Body Sherd	Smoothed	Grit Tempered			54
F01/SEC G	Body Sherd	Smoothed	Limestone/Grit Tempered			1
F01/SEC G	Body Sherd	Smoothed	Micaceous Sand Tempered			1
F01/SEC G	Body Sherd	Smoothed	Sand Tempered			2
F01/SEC G	Body Sherd	Smoothed	Sand Tempered			4
F01/SEC G	Body Sherd	Smoothed	Sand/Grit Tempered			16
F01/SEC G	Body Sherd	Smoothed	Sand/Grit Tempered			63
F01/SEC G	Body Sherd	Smoothed/Cord wrapped Dowel	Sand/Grit Tempered			1
F01/SEC G	Body Sherd	Smoothed/Punctate	Grit Tempered			1
F01/SEC G	Body Sherd	Smoothed/Simple Stamped	Sand/Grit Tempered			1
F01/SEC G	Body Sherd	Unidentifiable	Grit Tempered			5
F01/SEC G	Body Sherd	Unidentifiable	Micaceous Sand Tempered			1
F01/SEC G	Body Sherd	Unidentifiable	Sand Tempered			1
F01/SEC G	Body Sherd	Unidentifiable	Sand Tempered			2
F01/SEC G	Body Sherd	Unidentifiable	Sand/Grit Tempered			14
F01/SEC G	Body Sherd	Unidentifiable	Shell Tempered			1
F01/SEC G	Bone					737

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC G	Core	Bipolar		Quartz		1
F01/SEC G	Core	Bipolar		Quartz		1
F01/SEC G	Core	Core Fragment		Quartz		2
F01/SEC G	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		9
F01/SEC G	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		3
F01/SEC G	Debitage	2ndry/Biface Thinning Flake	Noncortical	Metavolcanic		1
F01/SEC G	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		23
F01/SEC G	Debitage	Angular, Blocky Frag/Chunks	1-74% Cortex	Quartz		1
F01/SEC G	Debitage	Angular, Blocky Frag/Chunks	>75% Cortex	Quartz		1
F01/SEC G	Debitage	Angular, Blocky Frag/Chunks	Noncortical	Quartz		3
F01/SEC G	Debitage	Bipolar Flake	1-74% Cortex	Quartz		5
F01/SEC G	Debitage	Bipolar Flake	>75% Cortex	Quartz		1
F01/SEC G	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		10
F01/SEC G	Debitage	Flake Frag./Shatter	>75% Cortex	Metavolcanic		1
F01/SEC G	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		5
F01/SEC G	Debitage	Flake Frag./Shatter	Noncortical	Quartz		33
F01/SEC G	Debitage	Flake Frag./Shatter	Noncortical	Quartzite		1
F01/SEC G	Debitage	Flake Frag./Shatter	Noncortical	Vitric Tuff		1
F01/SEC G	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		6
F01/SEC G	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		2
F01/SEC G	Debitage	Primary/Reduction Flake	>75% Cortex	Quartzite		2
F01/SEC G	Debitage	Primary/Reduction Flake	Noncortical	Quartz		2
F01/SEC G	Fire-cracked Rock					44
F01/SEC G	Hafted Biface	Savannah River Cluster	Complete	Quartz		1
F01/SEC G	Hafted Biface	Small Triangular Cluster	Midsection	Quartz		1
F01/SEC G	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		1
F01/SEC G	Hafted Biface	Unidentified Type	Distal Fragment	Quartz		1
F01/SEC G	Informal Groundstone	Other Form		Unidentified Material		1
F01/SEC G	Misc./Unmodified Stone			Bog Iron		3
F01/SEC G	Misc./Unmodified Stone			Limestone		6
F01/SEC G	Misc./Unmodified Stone			Unidentified Material		3
F01/SEC G	Other Formal Tool	Endscraper		Quartz		4
F01/SEC G	Pipe					1
F01/SEC G	Rim Sherd	Cord Marked	Angular/crushed Grit Tempered			1
F01/SEC G	Rim Sherd	Cord Marked	Grit Tempered			5
F01/SEC G	Rim Sherd	Cord Marked	Grit Tempered			7

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC G	Rim Sherd	Cord Marked	Limestone Tempered			1
F01/SEC G	Rim Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC G	Rim Sherd	Cord Marked	Sand/Grit Tempered			4
F01/SEC G	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
F01/SEC G	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			3
F01/SEC G	Rim Sherd	Cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F01/SEC G	Rim Sherd	Cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F01/SEC G	Rim Sherd	Cord-wrapped Dowel	Grit Tempered			1
F01/SEC G	Rim Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC G	Rim Sherd	Eroded	Sand/Grit Tempered			2
F01/SEC G	Rim Sherd	Plain	Sand Tempered			1
F01/SEC G	Rim Sherd	Plain	Untempered			6
F01/SEC G	Rim Sherd	Plain/Cord Impressed	Sand/Grit Tempered			1
F01/SEC G	Rim Sherd	Smoothed	Grit Tempered			1
F01/SEC G	Rim Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC G	Rim Sherd	Smoothed	Sand/Grit Tempered			2
F01/SEC G	Rim Sherd	Unidentifiable	Grit Tempered			1
F01/SEC G	Shell					110
F01/SEC G	Unident. Ceramic					1
F01/SEC G	Unident. Ceramic					3
				Provenience Total:	1625	
F01/SEC H						173
F01/SEC H	Basal Sherd	Cord Marked	Grit Tempered			2
F01/SEC H	Basal Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC H	Basal Sherd	Plain	Angular/crushed Grit Tempered			1
F01/SEC H	Basal Sherd	Plain	Untempered			4
F01/SEC H	Basal Sherd	Smoothed	Angular/crushed Grit Tempered			1
F01/SEC H	Basal Sherd	Smoothed	Grit Tempered			7
F01/SEC H	Basal Sherd	Smoothed	Micaceous Sand Tempered			1
F01/SEC H	Basal Sherd	Smoothed	Sand/Grit Tempered			11
F01/SEC H	Basal Sherd	Smoothed	Untempered			1
F01/SEC H	Biface	Stage 1	Complete	Quartz		2
F01/SEC H	Biface	Stage 2	Complete	Quartz		1
F01/SEC H	Biface	Stage 2	Distal Fragment	Quartz		1
F01/SEC H	Biface	Stage 2	Midsection	Quartz		2
F01/SEC H	Biface	Stage 3	Misc./Unident. Fragment	Quartz		3

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC H	Biface	Stage 4	Complete	Quartz		1
F01/SEC H	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			5
F01/SEC H	Body Sherd	Cord Marked	Grit Tempered			37
F01/SEC H	Body Sherd	Cord Marked	Sand Tempered			1
F01/SEC H	Body Sherd	Cord Marked	Sand/Grit Tempered			82
F01/SEC H	Body Sherd	Cord Marked	Shell Tempered			2
F01/SEC H	Body Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC H	Body Sherd	Cord-wrapped Dowel	Sand Tempered			1
F01/SEC H	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC H	Body Sherd	Fabric Impressed	Shell Tempered			1
F01/SEC H	Body Sherd	Fabric Impressed/Incised	Shell Tempered			1
F01/SEC H	Body Sherd	Plain	Angular/crushed Grit Tempered			1
F01/SEC H	Body Sherd	Plain	Angular/crushed Grit Tempered			2
F01/SEC H	Body Sherd	Plain	Sand/Grit Tempered			1
F01/SEC H	Body Sherd	Plain	Untempered			1
F01/SEC H	Body Sherd	Smoothed	Angular/crushed Grit Tempered			2
F01/SEC H	Body Sherd	Smoothed	Grit Tempered			16
F01/SEC H	Body Sherd	Smoothed	Limestone/Grit Tempered			1
F01/SEC H	Body Sherd	Smoothed	Sand Tempered			1
F01/SEC H	Body Sherd	Smoothed	Sand Tempered			1
F01/SEC H	Body Sherd	Smoothed	Sand/Grit Tempered			26
F01/SEC H	Body Sherd	Smoothed/Cord Impressed	Sand/Grit Tempered			2
F01/SEC H	Body Sherd	Smoothed/Cord Impressed	Untempered			1
F01/SEC H	Bone					1592
F01/SEC H	Core	Bipolar		Quartz		5
F01/SEC H	Core	Core Fragment		Quartz		2
F01/SEC H	Core	Random		Quartz		5
F01/SEC H	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		16
F01/SEC H	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		1
F01/SEC H	Debitage	2ndry/Biface Thinning Flake	Noncortical	Jasper		1
F01/SEC H	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		37
F01/SEC H	Debitage	2ndry/Biface Thinning Flake	Noncortical	Vitric Tuff		1
F01/SEC H	Debitage	Angular, Blocky Frag/Chunks	1-74% Cortex	Quartz		3
F01/SEC H	Debitage	Angular, Blocky Frag/Chunks	>75% Cortex	Quartz		1
F01/SEC H	Debitage	Angular, Blocky Frag/Chunks	>75% Cortex	Unident. Chert		1
F01/SEC H	Debitage	Angular, Blocky Frag/Chunks	Noncortical	Quartz		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC H	Debitage	Bipolar Flake	1-74% Cortex	Quartz		10
F01/SEC H	Debitage	Bipolar Flake	>75% Cortex	Quartz		9
F01/SEC H	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		30
F01/SEC H	Debitage	Flake Frag./Shatter	>75% Cortex	Greenstone		1
F01/SEC H	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		12
F01/SEC H	Debitage	Flake Frag./Shatter	Noncortical	Quartz		40
F01/SEC H	Debitage	Flake Frag./Shatter	Noncortical	Quartzite		3
F01/SEC H	Debitage	Flake Frag./Shatter	Noncortical	Slate		1
F01/SEC H	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		16
F01/SEC H	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartzite		1
F01/SEC H	Debitage	Primary/Reduction Flake	Noncortical	Quartz		2
F01/SEC H	Fire-cracked Rock					93
F01/SEC H	Hafted Biface	Piscataway	Distal Fragment	Quartz		1
F01/SEC H	Hafted Biface	Small Triangular Cluster	Distal Fragment	Quartz		1
F01/SEC H	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		2
F01/SEC H	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartzite		1
F01/SEC H	Hafted Biface	Unidentified Type	Misc./Unident. Fragment	Quartz		1
F01/SEC H	Informal Groundstone	Other Form		Limestone		4
F01/SEC H	Informal Tool	Retouched Flake	Concave Edge	Quartz		1
F01/SEC H	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F01/SEC H	Informal Tool	Utilized Flake	Straight Edge	Quartz		1
F01/SEC H	Misc./Unmodified Stone			Bog Iron		7
F01/SEC H	Misc./Unmodified Stone			Limestone		2
F01/SEC H	Misc./Unmodified Stone			Limestone		3
F01/SEC H	Other Formal Tool	Endscraper		Quartz		2
F01/SEC H	Other Formal Tool	Endscraper		Quartz		2
F01/SEC H	Pipe					6
F01/SEC H	Rim Sherd	Cord Marked	Grit Tempered			5
F01/SEC H	Rim Sherd	Cord Marked	Sand/Grit Tempered			10
F01/SEC H	Rim Sherd	Cord Marked	Shell and Grit Tempered			1
F01/SEC H	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			4
F01/SEC H	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			3
F01/SEC H	Rim Sherd	Plain	Sand/Grit Tempered			2
F01/SEC H	Rim Sherd	Plain	Untempered			2
F01/SEC H	Rim Sherd	Plain/Cord Impressed	Untempered			1
F01/SEC H	Rim Sherd	Smoothed	Sand/Grit Tempered			1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC H	Rim Sherd	Smoothed/Cord Impressed	Grit Tempered			1
F01/SEC H	Rim Sherd	Smoothed/Cord Impressed	Sand/Grit Tempered			1
F01/SEC H	Rim Sherd	Unidentifiable	Grit Tempered			1
F01/SEC H	Rim Sherd	Unidentifiable	Sand/Grit Tempered			1
F01/SEC H	Shell					208
F01/SEC H	Unident. Ceramic					3
F01/SEC H	Unident. Ceramic					5
				Provenience Total:	2568	
F01/SEC I						226
F01/SEC I	Basal Sherd	Cord Marked	Grit Tempered			2
F01/SEC I	Basal Sherd	Cord Marked	Sand/Grit Tempered			9
F01/SEC I	Basal Sherd	Cord Marked	Untempered			1
F01/SEC I	Basal Sherd	Plain	Sand/Grit Tempered			1
F01/SEC I	Basal Sherd	Plain	Untempered			2
F01/SEC I	Basal Sherd	Plain/Burnished	Sand/Grit Tempered			1
F01/SEC I	Basal Sherd	Smoothed	Grit Tempered			1
F01/SEC I	Basal Sherd	Smoothed	Sand/Grit Tempered			7
F01/SEC I	Basal Sherd	Smoothed	Untempered			1
F01/SEC I	Biface	Stage 2	Complete	Quartz		1
F01/SEC I	Biface	Stage 2	Misc./Unident. Fragment	Quartz		2
F01/SEC I	Biface	Stage 3	Complete	Quartz		1
F01/SEC I	Biface	Stage 4	Midsection	Quartz		1
F01/SEC I	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			1
F01/SEC I	Body Sherd	Cord Marked	Grit Tempered			28
F01/SEC I	Body Sherd	Cord Marked	Limestone Tempered			1
F01/SEC I	Body Sherd	Cord Marked	Limestone/Grit Tempered			1
F01/SEC I	Body Sherd	Cord Marked	Sand Tempered			5
F01/SEC I	Body Sherd	Cord Marked	Sand/Grit Tempered			42
F01/SEC I	Body Sherd	Cord Marked	Untempered			1
F01/SEC I	Body Sherd	Cord Marked/Cord Impressed	Sand Tempered			1
F01/SEC I	Body Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
F01/SEC I	Body Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC I	Body Sherd	Fabric Impressed	Shell Tempered			2
F01/SEC I	Body Sherd	Plain	Sand Tempered			3
F01/SEC I	Body Sherd	Plain	Untempered			2
F01/SEC I	Body Sherd	Smoothed	Grit Tempered			5

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC I	Body Sherd	Smoothed	Sand/Grit Tempered			4
F01/SEC I	Bone					473
F01/SEC I	Core	Bipolar		Quartz		2
F01/SEC I	Core	Core Fragment		Quartz		3
F01/SEC I	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		6
F01/SEC I	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		3
F01/SEC I	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		25
F01/SEC I	Debitage	Bipolar Flake	1-74% Cortex	Quartz		2
F01/SEC I	Debitage	Bipolar Flake	>75% Cortex	Quartz		3
F01/SEC I	Debitage	Bipolar Flake	Noncortical	Quartz		1
F01/SEC I	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		12
F01/SEC I	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		3
F01/SEC I	Debitage	Flake Frag./Shatter	Noncortical	Quartz		27
F01/SEC I	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		11
F01/SEC I	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		1
F01/SEC I	Fire-cracked Rock					19
F01/SEC I	Hafted Biface	Unidentified Type	Distal Fragment	Quartzite		1
F01/SEC I	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F01/SEC I	Misc./Unmodified Stone			Bog Iron		6
F01/SEC I	Other Formal Tool	Endscraper		Quartz		2
F01/SEC I	Pipe					1
F01/SEC I	Rim Sherd	Cord Marked	Grit Tempered			4
F01/SEC I	Rim Sherd	Cord Marked	Limestone/Grit Tempered			1
F01/SEC I	Rim Sherd	Cord Marked	Sand Tempered			1
F01/SEC I	Rim Sherd	Cord Marked	Sand/Grit Tempered			3
F01/SEC I	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC I	Rim Sherd	Cord Marked/Cord Impressed	Micaceous Sand Tempered			1
F01/SEC I	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			2
F01/SEC I	Rim Sherd	Cord Marked/cord-wrapped Dowel	Grit Tempered			2
F01/SEC I	Rim Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC I	Rim Sherd	Cord-wrapped Dowel	Sand Tempered			1
F01/SEC I	Rim Sherd	Plain	Untempered			1
F01/SEC I	Rim Sherd	Plain/cord-wrapped Dowel	Grit Tempered			1
F01/SEC I	Rim Sherd	Plain/cord-wrapped Dowel	Sand Tempered			1
F01/SEC I	Rim Sherd	Plain/cord-wrapped Dowel	Sand/Grit Tempered			2
F01/SEC I	Shell					60

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC I	Unident. Ceramic					1
				Provenience Total:		1039
F01/SEC J						101
F01/SEC J	Basal Sherd	Cord Marked	Sand/Grit Tempered			3
F01/SEC J	Basal Sherd	Plain	Grit Tempered			1
F01/SEC J	Basal Sherd	Smoothed	Sand/Grit Tempered			5
F01/SEC J	Biface	Stage 2	Complete	Quartz		1
F01/SEC J	Biface	Stage 3	Midsection	Quartz		1
F01/SEC J	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			2
F01/SEC J	Body Sherd	Cord Marked	Grit Tempered			16
F01/SEC J	Body Sherd	Cord Marked	Limestone Tempered			4
F01/SEC J	Body Sherd	Cord Marked	Limestone/Grit Tempered			1
F01/SEC J	Body Sherd	Cord Marked	Sand Tempered			2
F01/SEC J	Body Sherd	Cord Marked	Sand/Grit Tempered			22
F01/SEC J	Body Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC J	Body Sherd	Cord Marked/cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F01/SEC J	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC J	Body Sherd	Plain	Untempered			1
F01/SEC J	Body Sherd	Plain	Untempered			1
F01/SEC J	Body Sherd	Plain/cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC J	Body Sherd	Smoothed	Grit Tempered			1
F01/SEC J	Body Sherd	Smoothed	Sand/Grit Tempered			9
F01/SEC J	Body Sherd	Unidentifiable	Sand/Grit Tempered			2
F01/SEC J	Bone					219
F01/SEC J	Core	Bifacial		Quartz		1
F01/SEC J	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F01/SEC J	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		2
F01/SEC J	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		7
F01/SEC J	Debitage	Angular, Blocky Frag/Chunks	1-74% Cortex	Quartz		1
F01/SEC J	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F01/SEC J	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		3
F01/SEC J	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		1
F01/SEC J	Debitage	Flake Frag./Shatter	Noncortical	Quartz		12
F01/SEC J	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		2
F01/SEC J	Debitage	Tested Cobble/Nodule	>75% Cortex	Quartz		1
F01/SEC J	Fire-cracked Rock					17

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC J	Hafted Biface	Small Triangular Cluster	Complete	Orthoquartzite		1
F01/SEC J	Hafted Biface	Small Triangular Cluster	Complete	Quartz		1
F01/SEC J	Hafted Biface	Unidentified Type	Distal Fragment	Quartz		1
F01/SEC J	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F01/SEC J	Other Formal Tool	Endscraper		Quartz		2
F01/SEC J	Pipe					2
F01/SEC J	Rim Sherd	Cord Marked	Grit Tempered			3
F01/SEC J	Rim Sherd	Cord Marked	Sand/Grit Tempered			1
F01/SEC J	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC J	Rim Sherd	Plain	Untempered			2
F01/SEC J	Rim Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC J	Rim Sherd	Smoothed/Incised	Sand/Grit Tempered			2
F01/SEC J	Shell					46
F01/SEC J	Vessel	Plain	Untempered			1
				Provenience Total:		510
F01/SEC K						129
F01/SEC K	Basal Sherd	Cord Marked	Grit Tempered			2
F01/SEC K	Basal Sherd	Cord Marked	Shell and Grit Tempered			1
F01/SEC K	Basal Sherd	Net Impressed	Sand/Grit Tempered			2
F01/SEC K	Basal Sherd	Plain/Incised	Untempered			1
F01/SEC K	Basal Sherd	Smoothed	Grit Tempered			1
F01/SEC K	Basal Sherd	Unidentifiable	Grit Tempered			1
F01/SEC K	Biface	Stage 3	Complete	Quartz		1
F01/SEC K	Biface	Stage 3	Distal Fragment	Quartz		1
F01/SEC K	Biface	Stage 3	Misc./Unident. Fragment	Quartz		1
F01/SEC K	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			3
F01/SEC K	Body Sherd	Cord Marked	Grit Tempered			14
F01/SEC K	Body Sherd	Cord Marked	Sand/Grit Tempered			15
F01/SEC K	Body Sherd	Cord Marked/Incised	Grit Tempered			1
F01/SEC K	Body Sherd	Cord Marked/cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F01/SEC K	Body Sherd	Fabric Impressed	Shell Tempered			2
F01/SEC K	Body Sherd	Fabric Impressed/Incised	Shell Tempered			1
F01/SEC K	Body Sherd	Plain	Angular/crushed Grit Tempered			1
F01/SEC K	Body Sherd	Punctate/Cord wrapped Dowel	Angular/crushed Grit Tempered			1
F01/SEC K	Body Sherd	Smoothed	Grit Tempered			2
F01/SEC K	Body Sherd	Smoothed	Sand/Grit Tempered			3

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC K	Bone					1
F01/SEC K	Bone					84
F01/SEC K	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		3
F01/SEC K	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		4
F01/SEC K	Debitage	Angular, Blocky Frag/Chunks	1-74% Cortex	Unident. Chert		2
F01/SEC K	Debitage	Bipolar Flake	1-74% Cortex	Quartz		2
F01/SEC K	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		5
F01/SEC K	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		3
F01/SEC K	Debitage	Flake Frag./Shatter	Noncortical	Quartz		15
F01/SEC K	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		4
F01/SEC K	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		1
F01/SEC K	Fire-cracked Rock					15
F01/SEC K	Informal Groundstone	Other Form		Limestone		3
F01/SEC K	Misc./Unmodified Stone			Bog Iron		1
F01/SEC K	Pipe					1
F01/SEC K	Rim Sherd	Cord Marked	Sand/Grit Tempered			1
F01/SEC K	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC K	Rim Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			2
F01/SEC K	Rim Sherd	Punctate/Cord wrapped Dowel	Angular/crushed Grit Tempered			3
F01/SEC K	Shell					6
				Provenience Total:	341	
F01/SEC K-1						70
F01/SEC K-1	Basal Sherd	Cord Marked	Grit Tempered			1
F01/SEC K-1	Basal Sherd	Cord Marked	Limestone/Grit Tempered			1
F01/SEC K-1	Basal Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC K-1	Basal Sherd	Plain	Untempered			1
F01/SEC K-1	Basal Sherd	Smoothed	Grit Tempered			3
F01/SEC K-1	Basal Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC K-1	Biface	Stage 4	Distal Fragment	Quartz		1
F01/SEC K-1	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			4
F01/SEC K-1	Body Sherd	Cord Marked	Grit Tempered			12
F01/SEC K-1	Body Sherd	Cord Marked	Sand Tempered			1
F01/SEC K-1	Body Sherd	Cord Marked	Sand/Grit Tempered			13
F01/SEC K-1	Body Sherd	Cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F01/SEC K-1	Body Sherd	Smoothed	Grit Tempered			3
F01/SEC K-1	Body Sherd	Smoothed	Sand/Grit Tempered			1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC K-1	Bone					39
F01/SEC K-1	Core	Bipolar		Quartz		1
F01/SEC K-1	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F01/SEC K-1	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		7
F01/SEC K-1	Debitage	2ndry/Biface Thinning Flake	Noncortical	Vitric Tuff		1
F01/SEC K-1	Debitage	Bipolar Flake	>75% Cortex	Quartz		1
F01/SEC K-1	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		4
F01/SEC K-1	Debitage	Flake Frag./Shatter	1-74% Cortex	Silicified Slate		1
F01/SEC K-1	Debitage	Flake Frag./Shatter	Noncortical	Quartz		6
F01/SEC K-1	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		5
F01/SEC K-1	Fire-cracked Rock					2
F01/SEC K-1	Other Ceramic					1
F01/SEC K-1	Other Formal Tool	Endscraper		Quartz		1
F01/SEC K-1	Pipe					2
F01/SEC K-1	Rim Sherd	Cord Marked	Grit Tempered			1
F01/SEC K-1	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
F01/SEC K-1	Shell					2
				Provenience Total:	191	
F01/SEC K-2						39
F01/SEC K-2	Basal Sherd	Cord Marked	Sand/Grit Tempered			1
F01/SEC K-2	Basal Sherd	Smoothed	Grit Tempered			1
F01/SEC K-2	Basal Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC K-2	Biface	Stage 1	Complete	Vitric Tuff		1
F01/SEC K-2	Body Sherd	Cord Marked	Grit Tempered			2
F01/SEC K-2	Body Sherd	Cord Marked	Sand/Grit Tempered			4
F01/SEC K-2	Body Sherd	Cord Marked/cord-wrapped Dowel	Grit Tempered			1
F01/SEC K-2	Body Sherd	Plain	Sand/Grit Tempered			1
F01/SEC K-2	Body Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC K-2	Bone					105
F01/SEC K-2	Core	Bipolar		Quartz		1
F01/SEC K-2	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		2
F01/SEC K-2	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		3
F01/SEC K-2	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		7
F01/SEC K-2	Debitage	Flake Frag./Shatter	Noncortical	Quartz		4
F01/SEC K-2	Debitage	Flake Frag./Shatter	Noncortical	Steatite		3
F01/SEC K-2	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC K-2	Debitage	Tested Cobble/Nodule	>75% Cortex	Quartzite		1
F01/SEC K-2	Fire-cracked Rock					3
F01/SEC K-2	Informal Tool	Retouched Flake	Straight Edge	Silicified Slate		1
F01/SEC K-2	Other Formal Tool	Drill	Distal Fragment	Orthoquartzite		1
F01/SEC K-2	Shell					8
				Provenience Total:		193
F01/SEC L						91
F01/SEC L	Basal Sherd	Cord Marked	Grit Tempered			3
F01/SEC L	Basal Sherd	Cord Marked	Sand/Grit Tempered			4
F01/SEC L	Basal Sherd	Smoothed	Grit Tempered			1
F01/SEC L	Basal Sherd	Smoothed	Sand/Grit Tempered			7
F01/SEC L	Basal Sherd	Unidentifiable	Sand/Grit Tempered			1
F01/SEC L	Biface	Stage 2	Midsection	Quartz		1
F01/SEC L	Biface	Stage 2	Misc./Unident. Fragment	Quartz		1
F01/SEC L	Biface	Stage 3	Complete	Quartz		1
F01/SEC L	Body Sherd	Cord Marked	Grit Tempered			6
F01/SEC L	Body Sherd	Cord Marked	Sand Tempered			1
F01/SEC L	Body Sherd	Cord Marked	Sand/Grit Tempered			13
F01/SEC L	Body Sherd	Cord Marked/Cord Impressed	Sand Tempered			1
F01/SEC L	Body Sherd	Cord Marked/Incised	Sand/Grit Tempered			1
F01/SEC L	Body Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC L	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC L	Body Sherd	Plain	Sand Tempered			1
F01/SEC L	Body Sherd	Smoothed	Grit Tempered			2
F01/SEC L	Body Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC L	Body Sherd	Smoothed	Sand/Grit Tempered			6
F01/SEC L	Body Sherd	Unidentifiable	Micaceous Sand Tempered			1
F01/SEC L	Bone					81
F01/SEC L	Core	Bipolar		Quartz		4
F01/SEC L	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		2
F01/SEC L	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		6
F01/SEC L	Debitage	Bipolar Flake	1-74% Cortex	Quartz		2
F01/SEC L	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		2
F01/SEC L	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		1
F01/SEC L	Debitage	Flake Frag./Shatter	Noncortical	Quartz		4
F01/SEC L	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		8

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC L	Debitage	Primary/Reduction Flake	Noncortical	Quartz		1
F01/SEC L	Fire-cracked Rock					5
F01/SEC L	Hafted Biface	Small Triangular Cluster	Distal Fragment	Quartz		1
F01/SEC L	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		1
F01/SEC L	Misc./Unmodified Stone			Bog Iron		2
F01/SEC L	Misc./Unmodified Stone			Limestone		2
F01/SEC L	Other Formal Tool	Drill	Proximal Fragment	Quartz		1
F01/SEC L	Other Formal Tool	Other Form		Quartzite		1
F01/SEC L	Rim Sherd	Cord Marked	Grit Tempered			3
F01/SEC L	Rim Sherd	Cord Marked	Sand/Grit Tempered			1
F01/SEC L	Rim Sherd	Cord Marked/Cord Impressed	Sand Tempered			1
F01/SEC L	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			2
F01/SEC L	Rim Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			2
F01/SEC L	Rim Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC L	Shell					16
				Provenience Total:	295	
F01/SEC M						152
F01/SEC M	Basal Sherd	Cord Marked	Grit Tempered			4
F01/SEC M	Basal Sherd	Cord Marked	Limestone/Grit Tempered			1
F01/SEC M	Basal Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC M	Basal Sherd	Plain	Untempered			2
F01/SEC M	Basal Sherd	Smoothed	Grit Tempered			2
F01/SEC M	Basal Sherd	Smoothed	Sand/Grit Tempered			1
F01/SEC M	Basal Sherd	Unidentifiable	Sand/Grit Tempered			2
F01/SEC M	Biface	Stage 3	Complete	Quartz		1
F01/SEC M	Biface	Stage 3	Misc./Unident. Fragment	Quartz		1
F01/SEC M	Body Sherd	Cord Marked	Grit Tempered			23
F01/SEC M	Body Sherd	Cord Marked	Sand Tempered			2
F01/SEC M	Body Sherd	Cord Marked	Sand/Grit Tempered			44
F01/SEC M	Body Sherd	Cord Marked	Shell Tempered			3
F01/SEC M	Body Sherd	Cord Marked/Incised	Grit Tempered			1
F01/SEC M	Body Sherd	Cord-wrapped Dowel	Grit Tempered			1
F01/SEC M	Body Sherd	Fabric Impressed	Shell Tempered			2
F01/SEC M	Body Sherd	Smoothed	Grit Tempered			10
F01/SEC M	Body Sherd	Smoothed	Sand Tempered			1
F01/SEC M	Body Sherd	Smoothed	Sand/Grit Tempered			8

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F01/SEC M	Body Sherd	Smoothed/Cord Impressed	Sand/Grit Tempered			1
F01/SEC M	Bone					289
F01/SEC M	Core	Bipolar		Quartz		3
F01/SEC M	Core	Core Fragment		Quartz		1
F01/SEC M	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		5
F01/SEC M	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		2
F01/SEC M	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		13
F01/SEC M	Debitage	Bipolar Flake	1-74% Cortex	Quartz		2
F01/SEC M	Debitage	Bipolar Flake	>75% Cortex	Quartz		3
F01/SEC M	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		6
F01/SEC M	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		1
F01/SEC M	Debitage	Flake Frag./Shatter	Noncortical	Quartz		14
F01/SEC M	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		3
F01/SEC M	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		1
F01/SEC M	Debitage	Primary/Reduction Flake	Noncortical	Quartz		1
F01/SEC M	Debitage	Tertiary/Retouch Flake	Noncortical	Quartz		1
F01/SEC M	Fire-cracked Rock					37
F01/SEC M	Formal Groundstone	Gorget Fragment		Slate		1
F01/SEC M	Informal Groundstone	Other Form		Limestone		1
F01/SEC M	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F01/SEC M	Misc./Unmodified Stone			Limestone		2
F01/SEC M	Other Formal Tool	Endscraper		Quartz		1
F01/SEC M	Pipe					1
F01/SEC M	Rim Sherd	Cord Marked	Grit Tempered			4
F01/SEC M	Rim Sherd	Cord Marked	Sand/Grit Tempered			2
F01/SEC M	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F01/SEC M	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			3
F01/SEC M	Rim Sherd	Cord Marked/cord-wrapped Dowel	Grit Tempered			1
F01/SEC M	Rim Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			1
F01/SEC M	Rim Sherd	Plain	Sand/Grit Tempered			1
F01/SEC M	Rim Sherd	Plain	Untempered			1
F01/SEC M	Rim Sherd	Smoothed	Grit Tempered			1
F01/SEC M	Rim Sherd	Smoothed	Sand/Grit Tempered			2
F01/SEC M	Shell					23
F01/SEC M	Unident. Ceramic					1

Provenience Total: 694

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F03/SEC B						11
F03/SEC B	Basal Sherd	Cord Marked	Sand/Grit Tempered			2
F03/SEC B	Body Sherd	Cord Marked	Sand/Grit Tempered			3
F03/SEC B	Bone					57
F03/SEC B	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		1
F03/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Fossiliferous Chert		1
F03/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		2
F03/SEC B	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F03/SEC B	Debitage	Flake Frag./Shatter	1-74% Cortex	Vitric Tuff		1
F03/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartz		5
F03/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartzite		1
F03/SEC B	Fire-cracked Rock					1
F03/SEC B	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		1
F03/SEC B	Misc./Unmodified Stone			Limestone		1
F03/SEC B	Shell					2
				Provenience Total:	90	
F03/SEC C						49
F03/SEC C	Basal Sherd	Cord Marked	Grit Tempered			1
F03/SEC C	Basal Sherd	Smoothed	Grit Tempered			1
F03/SEC C	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F03/SEC C	Body Sherd	Smoothed	Sand/Grit Tempered			3
F03/SEC C	Bone					91
F03/SEC C	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F03/SEC C	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Silicified Slate		1
F03/SEC C	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		2
F03/SEC C	Debitage	2ndry/Biface Thinning Flake	Noncortical	Vitric Tuff		1
F03/SEC C	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F03/SEC C	Debitage	Bipolar Flake	>75% Cortex	Quartz		2
F03/SEC C	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		7
F03/SEC C	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		2
F03/SEC C	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
F03/SEC C	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		1
F03/SEC C	Debitage	Primary/Reduction Flake	Noncortical	Quartz		2
F03/SEC C	Informal Tool	Utilized Flake	Straight Edge	Quartz		1
F03/SEC C	Pipe					1
F03/SEC C	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F03/SEC C	Shell					13
				Provenience Total:	183	
F04/CLEAN UP						2
F04/CLEAN UP	Bone					1
F04/CLEAN UP	Core	Bipolar		Quartz		1
				Provenience Total:	4	
F04/SEC A						6
F04/SEC A	Body Sherd	Cord Marked	Grit Tempered			1
F04/SEC A	Bone					25
F04/SEC A	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F04/SEC A	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		3
F04/SEC A	Fire-cracked Rock					1
F04/SEC A	Shell					1
F04/SEC A	Unident. Ceramic					1
				Provenience Total:	39	
F04/SEC B						9
F04/SEC B	Bone					13
F04/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		1
F04/SEC B	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		1
F04/SEC B	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		1
F04/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
F04/SEC B	Fire-cracked Rock					1
F04/SEC B	Shell					1
				Provenience Total:	28	
F04/SEC C						75
F04/SEC C	Biface	Stage 3	Misc./Unident. Fragment	Quartz		1
F04/SEC C	Body Sherd	Cord Marked	Grit Tempered			1
F04/SEC C	Bone					87
F04/SEC C	Core	Bipolar		Quartz		2
F04/SEC C	Core	Core Fragment		Quartz		2
F04/SEC C	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		4
F04/SEC C	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		1
F04/SEC C	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		12
F04/SEC C	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		12
F04/SEC C	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		3
F04/SEC C	Debitage	Flake Frag./Shatter	Noncortical	Quartz		20

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F04/SEC C	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		1
F04/SEC C	Fire-cracked Rock					6
F04/SEC C	Hafted Biface	Unidentified Type	Proximal Fragment	Quartz		1
F04/SEC C	Pipe					1
F04/SEC C	Shell					5
				Provenience Total:		234
F05/06/SEC D						55
F05/06/SEC D	Basal Sherd	Smoothed	Sand/Grit Tempered			4
F05/06/SEC D	Biface	Stage 4	Distal Fragment	Quartz		1
F05/06/SEC D	Body Sherd	Cord Marked	Sand/Grit Tempered			6
F05/06/SEC D	Body Sherd	Smoothed	Sand Tempered			1
F05/06/SEC D	Body Sherd	Smoothed	Sand/Grit Tempered			3
F05/06/SEC D	Bone					154
F05/06/SEC D	Core	Core Fragment		Quartz		1
F05/06/SEC D	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F05/06/SEC D	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		2
F05/06/SEC D	Debitage	2ndry/Biface Thinning Flake	Noncortical	Fossiliferous Chert		1
F05/06/SEC D	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		9
F05/06/SEC D	Debitage	Angular, Blocky Frag/Chunks	1-74% Cortex	Quartz		1
F05/06/SEC D	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F05/06/SEC D	Debitage	Bipolar Flake	>75% Cortex	Quartz		1
F05/06/SEC D	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		2
F05/06/SEC D	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		3
F05/06/SEC D	Debitage	Flake Frag./Shatter	Noncortical	Quartz		14
F05/06/SEC D	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		2
F05/06/SEC D	Debitage	Primary/Reduction Flake	Noncortical	Quartz		1
F05/06/SEC D	Debitage	Tested Cobble/Nodule	>75% Cortex	Quartzite		1
F05/06/SEC D	Fire-cracked Rock					6
F05/06/SEC D	Informal Groundstone	Pitted Stone	Misc./Unident. Fragment	Sandstone		1
F05/06/SEC D	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F05/06/SEC D	Misc./Unmodified Stone			Bog Iron		3
F05/06/SEC D	Rim Sherd	Cord Marked	Grit Tempered			1
F05/06/SEC D	Rim Sherd	Plain	Untempered			1
F05/06/SEC D	Shell					2
F05/06/SEC D	Shell	Modified	Bead			1
				Provenience Total:		280

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F05/06A/SEC E	Basal Sherd	Plain	Sand Tempered			1
F05/06A/SEC E	Body Sherd	Cord Marked	Grit Tempered			4
F05/06A/SEC E	Body Sherd	Cord Marked	Sand/Grit Tempered			2
F05/06A/SEC E	Body Sherd	Smoothed	Grit Tempered			1
F05/06A/SEC E	Bone					198
F05/06A/SEC E	Core	Core Fragment		Quartz		1
F05/06A/SEC E	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		5
F05/06A/SEC E	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		3
F05/06A/SEC E	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		11
F05/06A/SEC E	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartzite		1
F05/06A/SEC E	Debitage	Bipolar Flake	1-74% Cortex	Quartz		2
F05/06A/SEC E	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		6
F05/06A/SEC E	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		5
F05/06A/SEC E	Debitage	Flake Frag./Shatter	Noncortical	Quartz		23
F05/06A/SEC E	Fire-cracked Rock					13
F05/06A/SEC E	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		1
F05/06A/SEC E	Hafted Biface	Unidentified Type	Misc./Unident. Fragment	Quartz		1
F05/06A/SEC E	Misc./Unmodified Stone			Slate		1
F05/06A/SEC E	Other Formal Tool	Endscraper		Quartz		1
F05/06A/SEC E	Pipe					1
F05/06A/SEC E	Rim Sherd	Plain	Untempered			1
F05/06A/SEC E	Shell					61
F05/06A/SEC E	Unident. Ceramic					7
				Provenience Total:		350
F05/CLEAN UP						8
F05/CLEAN UP	Basal Sherd	Smoothed	Grit Tempered			2
F05/CLEAN UP	Bead	Plain				1
F05/CLEAN UP	Body Sherd	Cord Marked	Grit Tempered			2
F05/CLEAN UP	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F05/CLEAN UP	Bone					4
F05/CLEAN UP	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		1
F05/CLEAN UP	Rim Sherd	Cord Impressed	Sand/Grit Tempered			1
F05/CLEAN UP	Shell					1
				Provenience Total:		21
F05/SEC B						37
F05/SEC B	Basal Sherd	Smoothed	Sand/Grit Tempered			2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F05/SEC B	Body Sherd	Cord Marked	Grit Tempered			2
F05/SEC B	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F05/SEC B	Body Sherd	Cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F05/SEC B	Bone					53
F05/SEC B	Core	Core Fragment		Quartz		1
F05/SEC B	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F05/SEC B	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		1
F05/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		6
F05/SEC B	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		5
F05/SEC B	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		1
F05/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartz		14
F05/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartzite		1
F05/SEC B	Fire-cracked Rock					4
F05/SEC B	Hafted Biface	Unidentified Type	Misc./Unident. Fragment	Quartz		1
F05/SEC B	Misc./Unmodified Stone			Limestone		1
F05/SEC B	Rim Sherd	Cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F05/SEC B	Shell					10
				Provenience Total:	143	
F05/SEC C						93
F05/SEC C	Biface	Stage 4	Distal Fragment	Quartz		1
F05/SEC C	Biface	Stage 4	Proximal Fragment	Quartz		1
F05/SEC C	Body Sherd	Cord Marked	Grit Tempered			1
F05/SEC C	Body Sherd	Cord Marked	Sand/Grit Tempered			2
F05/SEC C	Body Sherd	Smoothed	Grit Tempered			1
F05/SEC C	Bone					28
F05/SEC C	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		3
F05/SEC C	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		6
F05/SEC C	Debitage	Bipolar Flake	1-74% Cortex	Quartz		2
F05/SEC C	Debitage	Bipolar Flake	>75% Cortex	Quartz		2
F05/SEC C	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		6
F05/SEC C	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		2
F05/SEC C	Debitage	Flake Frag./Shatter	Noncortical	Quartz		10
F05/SEC C	Debitage	Primary/Reduction Flake	Noncortical	Quartz		1
F05/SEC C	Fire-cracked Rock					1
F05/SEC C	Other Formal Tool	Endscraper		Quartz		1
F05/SEC C	Shell					5

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
					Provenience Total:	166
F06/07/SEC F						18
F06/07/SEC F	Basal Sherd	Simple Stamped	Sand/Grit Tempered			1
F06/07/SEC F	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F06/07/SEC F	Body Sherd	Fabric Impressed	Shell Tempered			1
F06/07/SEC F	Body Sherd	Smoothed	Grit Tempered			1
F06/07/SEC F	Body Sherd	Smoothed	Sand/Grit Tempered			4
F06/07/SEC F	Bone					25
F06/07/SEC F	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F06/07/SEC F	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		2
F06/07/SEC F	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		1
F06/07/SEC F	Debitage	Flake Frag./Shatter	Noncortical	Quartz		2
F06/07/SEC F	Debitage	Flake Frag./Shatter	Noncortical	Steatite		1
F06/07/SEC F	Fire-cracked Rock					2
F06/07/SEC F	Shell					11
F06/07/SEC F	Shell	Modified	Bead			1
					Provenience Total:	72
F06/CLEAN UP						9
F06/CLEAN UP	Body Sherd	Cord Marked	Sand/Grit Tempered			5
F06/CLEAN UP	Bone					4
F06/CLEAN UP	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		1
F06/CLEAN UP	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
F06/CLEAN UP	Fire-cracked Rock					1
F06/CLEAN UP	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		1
					Provenience Total:	22
F06/SEC B						15
F06/SEC B	Bone					6
F06/SEC B	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		1
F06/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		1
F06/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
F06/SEC B	Shell					2
					Provenience Total:	26
F06/SEC C						28
F06/SEC C	Body Sherd	Smoothed	Sand/Grit Tempered			1
F06/SEC C	Bone					8
F06/SEC C	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F06/SEC C	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		2
F06/SEC C	Debitage	Bipolar Flake	>75% Cortex	Quartz		1
F06/SEC C	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		2
F06/SEC C	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		2
F06/SEC C	Debitage	Flake Frag./Shatter	Noncortical	Quartz		4
F06/SEC C	Debitage	Flake Frag./Shatter	Noncortical	Silicified Slate		1
F06/SEC C	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		1
F06/SEC C	Fire-cracked Rock					3
F06/SEC C	Misc./Unmodified Stone			Bog Iron		1
				Provenience Total:		56
F07/CLEAN UP						4
F07/CLEAN UP	Body Sherd	Unidentifiable	Shell Tempered			1
F07/CLEAN UP	Bone					1
				Provenience Total:		6
F07/SEC B						97
F07/SEC B	Biface	Stage 4	Misc./Unident. Fragment	Quartz		1
F07/SEC B	Body Sherd	Cord Marked	Grit Tempered			1
F07/SEC B	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F07/SEC B	Bone					27
F07/SEC B	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		4
F07/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		8
F07/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Slate		1
F07/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Vitric Tuff		2
F07/SEC B	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F07/SEC B	Debitage	Bipolar Flake	>75% Cortex	Quartz		1
F07/SEC B	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		3
F07/SEC B	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		2
F07/SEC B	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		2
F07/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Metavolcanic		1
F07/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartz		15
F07/SEC B	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		3
F07/SEC B	Fire-cracked Rock					6
F07/SEC B	Rim Sherd	Smoothed	Grit Tempered			1
F07/SEC B	Shell					2
				Provenience Total:		179
F07/SEC C						26

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F07/SEC C	Body Sherd	Smoothed	Sand/Grit Tempered			1
F07/SEC C	Bone					8
F07/SEC C	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		3
F07/SEC C	Debitage	Bipolar Flake	1-74% Cortex	Quartz		3
F07/SEC C	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		4
F07/SEC C	Debitage	Flake Frag./Shatter	Noncortical	Quartz		2
F07/SEC C	Fire-cracked Rock					1
F07/SEC C	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		1
F07/SEC C	Misc./Unmodified Stone			Unidentified Material		1
F07/SEC C	Pipe					1
F07/SEC C	Shell					1
				Provenience Total:		52
F08	Biface	Stage 1	Complete	Quartz		1
F08	Biface	Stage 4	Midsection	Quartz		1
F08	Core	Bipolar		Quartz		2
				Provenience Total:		4
F09/SEC A	Bone					8
F09/SEC A	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		1
F09/SEC A	Shell					1
				Provenience Total:		10
F09/SEC B						14
F09/SEC B	Basal Sherd	Smoothed	Grit Tempered			1
F09/SEC B	Body Sherd	Cord Marked	Grit Tempered			3
F09/SEC B	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F09/SEC B	Body Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			1
F09/SEC B	Body Sherd	Punctate/Cord wrapped Dowel	Angular/crushed Grit Tempered			1
F09/SEC B	Body Sherd	Smoothed	Grit Tempered			1
F09/SEC B	Body Sherd	Smoothed	Sand/Grit Tempered			1
F09/SEC B	Bone					36
F09/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		1
F09/SEC B	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F09/SEC B	Fire-cracked Rock					2
				Provenience Total:		63
F10/SEC A						85
F10/SEC A	Body Sherd	Plain	Sand/Grit Tempered			1
F10/SEC A	Body Sherd	Smoothed	Grit Tempered			2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F10/SEC A	Bone					46
F10/SEC A	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F10/SEC A	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Vitric Tuff		1
F10/SEC A	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		9
F10/SEC A	Debitage	2ndry/Biface Thinning Flake	Noncortical	Vitric Tuff		2
F10/SEC A	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F10/SEC A	Debitage	Bipolar Flake	>75% Cortex	Quartz		1
F10/SEC A	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		5
F10/SEC A	Debitage	Flake Frag./Shatter	Noncortical	Quartz		11
F10/SEC A	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		2
F10/SEC A	Debitage	Primary/Reduction Flake	Noncortical	Diabase		1
F10/SEC A	Debitage	Primary/Reduction Flake	Noncortical	Quartz		1
F10/SEC A	Fire-cracked Rock					11
F10/SEC A	Misc./Unmodified Stone			Limestone		1
F10/SEC A	Pipe					1
F10/SEC A	Shell					1
F10/SEC A	Unident. Ceramic					1
				Provenience Total:		184
F10/SEC B						18
F10/SEC B	Body Sherd	Cord Marked	Sand/Grit Tempered			2
F10/SEC B	Body Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			1
F10/SEC B	Bone					8
F10/SEC B	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		2
F10/SEC B	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		5
F10/SEC B	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		1
F10/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartz		4
				Provenience Total:		41
F11/SEC A						15
F11/SEC A	Basal Sherd	Cord Marked	Sand/Grit Tempered			1
F11/SEC A	Body Sherd	Cord Marked	Grit Tempered			1
F11/SEC A	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F11/SEC A	Body Sherd	Plain	Untempered			1
F11/SEC A	Body Sherd	Smoothed	Grit Tempered			1
F11/SEC A	Bone					16
F11/SEC A	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		1
F11/SEC A	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight (g)	Quantity
F11/SEC A	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		1
F11/SEC A	Fire-cracked Rock					1
F11/SEC A	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
					Provenience Total:	41
F11/SEC B						2
F11/SEC B	Basal Sherd	Smoothed	Sand/Grit Tempered			1
F11/SEC B	Body Sherd	Smoothed	Sand/Grit Tempered			1
F11/SEC B	Bone					4
F11/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
					Provenience Total:	9
F12-EAST HALF						66
F12-EAST HALF	Basal Sherd	Cord Marked	Grit Tempered			1
F12-EAST HALF	Basal Sherd	Cord Marked	Sand Tempered			2
F12-EAST HALF	Basal Sherd	Smoothed	Grit Tempered			2
F12-EAST HALF	Biface	Stage 2	Misc./Unident. Fragment	Quartz		1
F12-EAST HALF	Biface	Stage 3	Midsection	Quartz		1
F12-EAST HALF	Biface	Stage 3	Proximal Fragment	Quartz		1
F12-EAST HALF	Body Sherd	Cord Marked	Grit Tempered			2
F12-EAST HALF	Body Sherd	Cord Marked	Micaceous Sand Tempered			1
F12-EAST HALF	Body Sherd	Cord Marked	Sand Tempered			1
F12-EAST HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			8
F12-EAST HALF	Body Sherd	Cord Marked/Cord Impressed	Grit Tempered			2
F12-EAST HALF	Body Sherd	Plain	Untempered			1
F12-EAST HALF	Body Sherd	Smoothed	Grit Tempered			2
F12-EAST HALF	Body Sherd	Smoothed	Sand Tempered			3
F12-EAST HALF	Body Sherd	Smoothed	Sand/Grit Tempered			1
F12-EAST HALF	Body Sherd	Smoothed	Shell Tempered			1
F12-EAST HALF	Bone					363
F12-EAST HALF	Core	Bipolar		Quartz		3
F12-EAST HALF	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		5
F12-EAST HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Metavolcanic		1
F12-EAST HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		9
F12-EAST HALF	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F12-EAST HALF	Debitage	Bipolar Flake	Noncortical	Quartz		1
F12-EAST HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		6
F12-EAST HALF	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		2

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F12-EAST HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		5
F12-EAST HALF	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		6
F12-EAST HALF	Debitage	Primary/Reduction Flake	Noncortical	Quartz		1
F12-EAST HALF	Fire-cracked Rock					22
F12-EAST HALF	Informal Groundstone	Hammerstone	Complete	Quartzite		1
F12-EAST HALF	Misc./Unmodified Stone			Limestone		3
F12-EAST HALF	Rim Sherd	Cord Impressed	Angular/crushed Grit Tempered			1
F12-EAST HALF	Rim Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			2
F12-EAST HALF	Rim Sherd	Plain	Untempered			1
F12-EAST HALF	Shell					67
				Provenience Total:		596
F12/SURFACE						2
F12/SURFACE	Bone					4
F12/SURFACE	Debitage	Flake Frag./Shatter	Noncortical	Quartz		2
F12/SURFACE	Shell					1
				Provenience Total:		9
F12A-WEST HALF	Basal Sherd	Plain	Untempered			7
F12A-WEST HALF	Biface	Stage 2	Proximal Fragment	Quartz		1
F12A-WEST HALF	Biface	Stage 4	Distal Fragment	Quartz		1
F12A-WEST HALF	Body Sherd	Cord Impressed	Grit Tempered			2
F12A-WEST HALF	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			2
F12A-WEST HALF	Body Sherd	Cord Marked	Grit Tempered			6
F12A-WEST HALF	Body Sherd	Cord Marked	Grit Tempered			9
F12A-WEST HALF	Body Sherd	Cord Marked	Sand Tempered			2
F12A-WEST HALF	Body Sherd	Cord Marked	Sand Tempered			2
F12A-WEST HALF	Body Sherd	Cord Marked	Sand Tempered			22
F12A-WEST HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			2
F12A-WEST HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			6
F12A-WEST HALF	Body Sherd	Cord Marked/cord-wrapped Dowel	Angular/crushed Grit Tempered			4
F12A-WEST HALF	Body Sherd	Cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F12A-WEST HALF	Body Sherd	Eroded	Grit Tempered			1
F12A-WEST HALF	Body Sherd	Eroded	Sand Tempered			3
F12A-WEST HALF	Body Sherd	Eroded	Sand/Grit Tempered			6
F12A-WEST HALF	Body Sherd	Eroded	Shell Tempered			1
F12A-WEST HALF	Body Sherd	Fabric Impressed	Shell Tempered			1
F12A-WEST HALF	Body Sherd	Fabric Impressed/Incised	Shell Tempered			1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F12A-WEST HALF	Body Sherd	Incised	Shell Tempered			1
F12A-WEST HALF	Body Sherd	Plain	Sand Tempered			1
F12A-WEST HALF	Body Sherd	Plain	Sand Tempered			2
F12A-WEST HALF	Body Sherd	Plain	Sand/Grit Tempered			5
F12A-WEST HALF	Body Sherd	Plain	Untempered			4
F12A-WEST HALF	Body Sherd	Plain/cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F12A-WEST HALF	Body Sherd	Simple Stamped	Grit Tempered			1
F12A-WEST HALF	Body Sherd	Smoothed	Grit Tempered			1
F12A-WEST HALF	Body Sherd	Smoothed	Grit Tempered			13
F12A-WEST HALF	Body Sherd	Smoothed	Sand/Grit Tempered			1
F12A-WEST HALF	Body Sherd	Smoothed	Sand/Grit Tempered			1
F12A-WEST HALF	Body Sherd	Smoothed/Cord Impressed	Grit Tempered			1
F12A-WEST HALF	Body Sherd	Unidentifiable	Grit Tempered			5
F12A-WEST HALF	Body Sherd	Unidentifiable	Sand Tempered			2
F12A-WEST HALF	Body Sherd	Unidentifiable	Sand/Grit Tempered			7
F12A-WEST HALF	Body Sherd	Unidentifiable	Shell Tempered			4
F12A-WEST HALF	Bone					642
F12A-WEST HALF	Core	Bipolar		Quartz		1
F12A-WEST HALF	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		4
F12A-WEST HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Jasper		1
F12A-WEST HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Orthoquartzite		1
F12A-WEST HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		10
F12A-WEST HALF	Debitage	Angular, Blocky Frag/Chunks	>75% Cortex	Quartz		2
F12A-WEST HALF	Debitage	Bipolar Flake	1-74% Cortex	Quartz		6
F12A-WEST HALF	Debitage	Bipolar Flake	>75% Cortex	Quartz		3
F12A-WEST HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		7
F12A-WEST HALF	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		3
F12A-WEST HALF	Debitage	Flake Frag./Shatter	Noncortical	Metavolcanic		1
F12A-WEST HALF	Debitage	Flake Frag./Shatter	Noncortical	Orthoquartzite		1
F12A-WEST HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		20
F12A-WEST HALF	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		2
F12A-WEST HALF	Debitage	Primary/Reduction Flake	>75% Cortex	Quartzite		2
F12A-WEST HALF	Debitage	Primary/Reduction Flake	Noncortical	Quartz		2
F12A-WEST HALF	Fire-cracked Rock					22
F12A-WEST HALF	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		1
F12A-WEST HALF	Hafted Biface	Unidentified Type	Midsection	Quartz		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F12A-WEST HALF	Informal Groundstone	Pitted Stone		Quartzite		1
F12A-WEST HALF	Informal Groundstone	Pitted Stone		Unidentified Material		1
F12A-WEST HALF	Misc./Unmodified Stone			Bog Iron		8
F12A-WEST HALF	Other Formal Tool	Endscraper		Quartz		1
F12A-WEST HALF	Other Formal Tool	Other Form		Quartzite		2
F12A-WEST HALF	Pipe					1
F12A-WEST HALF	Rim Sherd	Cord Impressed	Grit Tempered			1
F12A-WEST HALF	Rim Sherd	Cord Marked	Grit Tempered			1
F12A-WEST HALF	Rim Sherd	Cord Marked/cord-wrapped Dowel	Grit Tempered			1
F12A-WEST HALF	Rim Sherd	Plain/Cord Impressed	Sand Tempered			2
F12A-WEST HALF	Rim Sherd	Plain/cord-wrapped Dowel	Sand Tempered			1
F12A-WEST HALF	Shell					78
F12A-WEST HALF	Unident. Ceramic					3
					Provenience Total:	963
F12C-WEST HALF						22
F12C-WEST HALF	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			2
F12C-WEST HALF	Body Sherd	Cord Marked	Grit Tempered			3
F12C-WEST HALF	Body Sherd	Cord Marked	Sand Tempered			2
F12C-WEST HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F12C-WEST HALF	Body Sherd	Cord Marked/cord-wrapped Dowel	Angular/crushed Grit Tempered			1
F12C-WEST HALF	Body Sherd	Smoothed	Sand Tempered			2
F12C-WEST HALF	Body Sherd	Smoothed/Cord wrapped Dowel	Sand/Grit Tempered			1
F12C-WEST HALF	Bone					106
F12C-WEST HALF	Core	Bipolar		Quartz		3
F12C-WEST HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		1
F12C-WEST HALF	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F12C-WEST HALF	Debitage	Bipolar Flake	>75% Cortex	Quartz		1
F12C-WEST HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		2
F12C-WEST HALF	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		2
F12C-WEST HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		4
F12C-WEST HALF	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		1
F12C-WEST HALF	Debitage	Primary/Reduction Flake	Noncortical	Quartz		1
F12C-WEST HALF	Fire-cracked Rock					3
F12C-WEST HALF	Rim Sherd	Plain	Untempered			1
F12C-WEST HALF	Rim Sherd	Smoothed	Sand Tempered			1
F12C-WEST HALF	Shell					15

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F12C-WEST HALF	Unident. Ceramic					6
				Provenience Total:	182	
F14-WEST HALF						8
F14-WEST HALF	Bone					11
F14-WEST HALF	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		1
F14-WEST HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		4
F14-WEST HALF	Fire-cracked Rock					1
F14-WEST HALF	Shell					3
				Provenience Total:	28	
F15-WEST HALF	Basal Sherd	Cord Marked	Grit Tempered			3
F15-WEST HALF	Basal Sherd	Cord Marked	Sand/Grit Tempered			9
F15-WEST HALF	Basal Sherd	Plain	Untempered			1
F15-WEST HALF	Basal Sherd	Smoothed	Angular/crushed Grit Tempered			1
F15-WEST HALF	Basal Sherd	Smoothed	Grit Tempered			2
F15-WEST HALF	Basal Sherd	Smoothed	Sand/Grit Tempered			1
F15-WEST HALF	Basal Sherd	Unidentifiable	Shell Tempered			1
F15-WEST HALF	Biface	Stage 2	Misc./Unident. Fragment	Quartz		1
F15-WEST HALF	Biface	Stage 3	Misc./Unident. Fragment	Quartz		1
F15-WEST HALF	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			2
F15-WEST HALF	Body Sherd	Cord Marked	Grit Tempered			24
F15-WEST HALF	Body Sherd	Cord Marked	Limestone Tempered			1
F15-WEST HALF	Body Sherd	Cord Marked	Sand Tempered			1
F15-WEST HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			11
F15-WEST HALF	Body Sherd	Cord Marked/Cord Impressed	Sand Tempered			2
F15-WEST HALF	Body Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
F15-WEST HALF	Body Sherd	Cord Marked/Incised	Grit Tempered			1
F15-WEST HALF	Body Sherd	Cord Marked/Punctate	Grit Tempered			1
F15-WEST HALF	Body Sherd	Cord Marked/cord-wrapped Dowel	Sand/Grit Tempered			1
F15-WEST HALF	Body Sherd	Fabric Impressed	Shell Tempered			1
F15-WEST HALF	Body Sherd	Smoothed	Grit Tempered			7
F15-WEST HALF	Body Sherd	Smoothed	Sand/Grit Tempered			3
F15-WEST HALF	Bone					313
F15-WEST HALF	Core	Bifacial		Quartz		2
F15-WEST HALF	Core	Random		Quartz		1
F15-WEST HALF	Core	Random		Unident. Chert		1
F15-WEST HALF	Debitage	Angular, Blocky Frag/Chunks	>75% Cortex	Unident. Chert		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F15-WEST HALF	Debitage	Flake Frag./Shatter	Noncortical	Metavolcanic		3
F15-WEST HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartzite		1
F15-WEST HALF	Debitage	Primary/Reduction Flake	Noncortical	Metavolcanic		1
F15-WEST HALF	Fire-cracked Rock					16
F15-WEST HALF	Hafted Biface	Small Triangular Cluster	Complete	Quartz		1
F15-WEST HALF	Hafted Biface	Small Triangular Cluster	Complete	Unident. Chert		1
F15-WEST HALF	Hafted Biface	Small Triangular Cluster	Distal Fragment	Quartz		1
F15-WEST HALF	Informal Tool	Utilized Flake	Straight Edge	Quartz		1
F15-WEST HALF	Misc./Unmodified Stone			Bog Iron		4
F15-WEST HALF	Misc./Unmodified Stone			Limestone		5
F15-WEST HALF	Other Formal Tool	Endscraper		Quartz		2
F15-WEST HALF	Other Formal Tool	Sidescraper		Quartz		1
F15-WEST HALF	Pipe					1
F15-WEST HALF	Rim Sherd	Cord Marked	Grit Tempered			2
F15-WEST HALF	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			2
F15-WEST HALF	Rim Sherd	Cord Marked/cord-wrapped Dowel	Grit Tempered			1
F15-WEST HALF	Rim Sherd	Plain	Untempered			1
F15-WEST HALF	Rim Sherd	Plain/Cord Impressed	Sand/Grit Tempered			1
F15-WEST HALF	Shell					71
F15-WEST HALF	Unident. Ceramic					3
				Provenience Total:	513	
F15/EAST HALF	Basal Sherd	Cord Marked	Grit Tempered			1
F15/EAST HALF	Basal Sherd	Cord Marked	Grit Tempered			1
F15/EAST HALF	Basal Sherd	Cord Marked	Sand Tempered			2
F15/EAST HALF	Basal Sherd	Cord Marked	Sand/Grit Tempered			1
F15/EAST HALF	Basal Sherd	Cord Marked	Sand/Grit Tempered			3
F15/EAST HALF	Basal Sherd	Plain	Untempered			1
F15/EAST HALF	Basal Sherd	Smoothed	Grit Tempered			3
F15/EAST HALF	Basal Sherd	Smoothed	Grit Tempered			4
F15/EAST HALF	Basal Sherd	Unidentifiable	Sand Tempered			1
F15/EAST HALF	Biface	Stage 2	Misc./Unident. Fragment	Quartz		2
F15/EAST HALF	Body Sherd	Cord Impressed	Angular/crushed Grit Tempered			1
F15/EAST HALF	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			2
F15/EAST HALF	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			2
F15/EAST HALF	Body Sherd	Cord Marked	Grit Tempered			25
F15/EAST HALF	Body Sherd	Cord Marked	Grit Tempered			43

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F15/EAST HALF	Body Sherd	Cord Marked	Micaceous Sand Tempered			2
F15/EAST HALF	Body Sherd	Cord Marked	Sand Tempered			1
F15/EAST HALF	Body Sherd	Cord Marked	Sand Tempered			6
F15/EAST HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			21
F15/EAST HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			39
F15/EAST HALF	Body Sherd	Cord Marked	Untempered			1
F15/EAST HALF	Body Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			2
F15/EAST HALF	Body Sherd	Cord Marked/Incised	Sand Tempered			1
F15/EAST HALF	Body Sherd	Cord Marked/Punctate	Sand/Grit Tempered			1
F15/EAST HALF	Body Sherd	Cord Marked/Punctate	Sand/Grit Tempered			3
F15/EAST HALF	Body Sherd	Cord Marked/cord-wrapped Dowel	Micaceous Sand Tempered			1
F15/EAST HALF	Body Sherd	Cord-wrapped Dowel	Sand Tempered			2
F15/EAST HALF	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			2
F15/EAST HALF	Body Sherd	Eroded	Grit Tempered			6
F15/EAST HALF	Body Sherd	Eroded	Sand Tempered			4
F15/EAST HALF	Body Sherd	Eroded	Sand/Grit Tempered			6
F15/EAST HALF	Body Sherd	Eroded	Sand/Grit Tempered			21
F15/EAST HALF	Body Sherd	Eroded	Shell Tempered			1
F15/EAST HALF	Body Sherd	Eroded	Untempered			1
F15/EAST HALF	Body Sherd	Fabric Impressed	Shell Tempered			2
F15/EAST HALF	Body Sherd	Fabric Impressed	Shell Tempered			5
F15/EAST HALF	Body Sherd	Plain	Sand Tempered			1
F15/EAST HALF	Body Sherd	Plain	Sand/Grit Tempered			1
F15/EAST HALF	Body Sherd	Plain	Untempered			5
F15/EAST HALF	Body Sherd	Smoothed	Angular/crushed Grit Tempered			1
F15/EAST HALF	Body Sherd	Smoothed	Grit Tempered			3
F15/EAST HALF	Body Sherd	Smoothed	Grit Tempered			10
F15/EAST HALF	Body Sherd	Smoothed	Sand Tempered			1
F15/EAST HALF	Body Sherd	Smoothed	Sand/Grit Tempered			4
F15/EAST HALF	Body Sherd	Smoothed	Sand/Grit Tempered			14
F15/EAST HALF	Body Sherd	Unidentifiable	Grit Tempered			2
F15/EAST HALF	Body Sherd	Unidentifiable	Grit Tempered			2
F15/EAST HALF	Body Sherd	Unidentifiable	Sand Tempered			3
F15/EAST HALF	Body Sherd	Unidentifiable	Sand/Grit Tempered			4
F15/EAST HALF	Body Sherd	Unidentifiable	Shell Tempered			1
F15/EAST HALF	Bone					556

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight (g)	Quantity
F15/EAST HALF	Core	Bipolar		Quartz		3
F15/EAST HALF	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		2
F15/EAST HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		9
F15/EAST HALF	Debitage	Bipolar Flake	1-74% Cortex	Quartz		3
F15/EAST HALF	Debitage	Bipolar Flake	>75% Cortex	Quartz		1
F15/EAST HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		3
F15/EAST HALF	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		2
F15/EAST HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		8
F15/EAST HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartzite		1
F15/EAST HALF	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		3
F15/EAST HALF	Debitage	Primary/Reduction Flake	>75% Cortex	Quartz		1
F15/EAST HALF	Fire-cracked Rock					36
F15/EAST HALF	Hafted Biface	Small Triangular Cluster	Complete	Quartz		1
F15/EAST HALF	Hafted Biface	Small Triangular Cluster	Proximal Fragment	Quartz		1
F15/EAST HALF	Informal Tool	Retouched Flake	Straight Edge	Quartz		1
F15/EAST HALF	Misc./Unmodified Stone			Bog Iron		1
F15/EAST HALF	Misc./Unmodified Stone			Limestone		2
F15/EAST HALF	Other Formal Tool	Endscraper		Quartz		1
F15/EAST HALF	Pipe					1
F15/EAST HALF	Rim Sherd	Cord Marked	Grit Tempered			2
F15/EAST HALF	Rim Sherd	Cord Marked	Sand Tempered			1
F15/EAST HALF	Rim Sherd	Cord Marked	Sand Tempered			2
F15/EAST HALF	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			1
F15/EAST HALF	Rim Sherd	Cord Marked/Cord Impressed	Grit Tempered			2
F15/EAST HALF	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
F15/EAST HALF	Rim Sherd	Cord Marked/cord-wrapped Dowel	Micaceous Sand Tempered			1
F15/EAST HALF	Rim Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			1
F15/EAST HALF	Rim Sherd	Fabric Impressed	Untempered			1
F15/EAST HALF	Rim Sherd	Plain	Grit Tempered			1
F15/EAST HALF	Rim Sherd	Plain	Untempered			1
F15/EAST HALF	Rim Sherd	Plain/cord-wrapped Dowel	Untempered			1
F15/EAST HALF	Rim Sherd	Smoothed	Sand/Grit Tempered			1
F15/EAST HALF	Rim Sherd	Smoothed	Untempered			1
F15/EAST HALF	Shell					35
				Provenience Total:	960	
F16-NORTH HALF	Core	Core Fragment		Quartz		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
				Provenience Total:		1
F17-NORTH HALF						35
F17-NORTH HALF	Basal Sherd	Cord Marked	Grit Tempered			1
F17-NORTH HALF	Basal Sherd	Cord Marked	Sand/Grit Tempered			2
F17-NORTH HALF	Basal Sherd	Smoothed	Sand Tempered			1
F17-NORTH HALF	Basal Sherd	Unidentifiable	Sand/Grit Tempered			1
F17-NORTH HALF	Body Sherd	Cord Marked	Grit Tempered			6
F17-NORTH HALF	Body Sherd	Cord Marked	Sand Tempered			3
F17-NORTH HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			17
F17-NORTH HALF	Body Sherd	Plain	Sand/Grit Tempered			1
F17-NORTH HALF	Body Sherd	Smoothed	Grit Tempered			2
F17-NORTH HALF	Body Sherd	Smoothed	Sand/Grit Tempered			1
F17-NORTH HALF	Bone					99
F17-NORTH HALF	Core	Bipolar		Quartz		1
F17-NORTH HALF	Core	Core Fragment		Quartz		1
F17-NORTH HALF	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F17-NORTH HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		3
F17-NORTH HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		1
F17-NORTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Metavolcanic		2
F17-NORTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		2
F17-NORTH HALF	Fire-cracked Rock					13
F17-NORTH HALF	Other Formal Tool	Endscraper		Quartz		1
F17-NORTH HALF	Rim Sherd	Cord Marked	Grit Tempered			1
F17-NORTH HALF	Rim Sherd	Cord Marked	Sand Tempered			1
F17-NORTH HALF	Rim Sherd	Cord Marked/cord-wrapped Dowel	Grit Tempered			1
F17-NORTH HALF	Shell					12
F17-NORTH HALF	Unident. Ceramic					1
				Provenience Total:		210
F17-SOUTH HALF	Basal Sherd	Plain	Untempered			1
F17-SOUTH HALF	Basal Sherd	Unidentifiable	Sand/Grit Tempered			1
F17-SOUTH HALF	Basal Sherd	Unidentifiable	Sand/Grit Tempered			4
F17-SOUTH HALF	Body Sherd	Cord Impressed	Sand Tempered			1
F17-SOUTH HALF	Body Sherd	Cord Impressed	Sand/Grit Tempered			2
F17-SOUTH HALF	Body Sherd	Cord Marked	Angular/crushed Grit Tempered			2
F17-SOUTH HALF	Body Sherd	Cord Marked	Grit Tempered			9
F17-SOUTH HALF	Body Sherd	Cord Marked	Grit Tempered			21

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F17-SOUTH HALF	Body Sherd	Cord Marked	Limestone/Grit Tempered			1
F17-SOUTH HALF	Body Sherd	Cord Marked	Sand Tempered			1
F17-SOUTH HALF	Body Sherd	Cord Marked	Sand Tempered			1
F17-SOUTH HALF	Body Sherd	Cord Marked	Sand Tempered			3
F17-SOUTH HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			3
F17-SOUTH HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			28
F17-SOUTH HALF	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			2
F17-SOUTH HALF	Body Sherd	Eroded	Grit Tempered			1
F17-SOUTH HALF	Body Sherd	Eroded	Sand Tempered			2
F17-SOUTH HALF	Body Sherd	Eroded	Sand Tempered			8
F17-SOUTH HALF	Body Sherd	Eroded	Sand/Grit Tempered			2
F17-SOUTH HALF	Body Sherd	Eroded	Sand/Grit Tempered			10
F17-SOUTH HALF	Body Sherd	Fabric Impressed	Shell Tempered			4
F17-SOUTH HALF	Body Sherd	Incised	Shell Tempered			1
F17-SOUTH HALF	Body Sherd	Net Impressed	Sand/Grit Tempered			1
F17-SOUTH HALF	Body Sherd	Plain	Angular/crushed Grit Tempered			1
F17-SOUTH HALF	Body Sherd	Plain	Grit Tempered			1
F17-SOUTH HALF	Body Sherd	Plain	Sand Tempered			2
F17-SOUTH HALF	Body Sherd	Plain	Sand/Grit Tempered			8
F17-SOUTH HALF	Body Sherd	Plain	Shell Tempered			2
F17-SOUTH HALF	Body Sherd	Plain	Untempered			1
F17-SOUTH HALF	Body Sherd	Plain/Cord Impressed	Sand/Grit Tempered			1
F17-SOUTH HALF	Body Sherd	Plain/cord-wrapped Dowel	Sand/Grit Tempered			2
F17-SOUTH HALF	Body Sherd	Simple Stamped	Sand Tempered			1
F17-SOUTH HALF	Body Sherd	Simple Stamped	Shell Tempered			1
F17-SOUTH HALF	Body Sherd	Smoothed	Angular/crushed Grit Tempered			2
F17-SOUTH HALF	Body Sherd	Smoothed	Grit Tempered			1
F17-SOUTH HALF	Body Sherd	Smoothed	Grit Tempered			13
F17-SOUTH HALF	Body Sherd	Smoothed	Sand Tempered			3
F17-SOUTH HALF	Body Sherd	Smoothed	Sand/Grit Tempered			3
F17-SOUTH HALF	Body Sherd	Smoothed	Sand/Grit Tempered			10
F17-SOUTH HALF	Body Sherd	Unidentifiable	Grit Tempered			6
F17-SOUTH HALF	Body Sherd	Unidentifiable	Sand Tempered			9
F17-SOUTH HALF	Body Sherd	Unidentifiable	Sand/Grit Tempered			21
F17-SOUTH HALF	Body Sherd	Unidentifiable	Shell Tempered			2
F17-SOUTH HALF	Bone					228

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F17-SOUTH HALF	Core	Random		Quartzite		1
F17-SOUTH HALF	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		6
F17-SOUTH HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		13
F17-SOUTH HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartzite		1
F17-SOUTH HALF	Debitage	Bipolar Flake	1-74% Cortex	Quartz		3
F17-SOUTH HALF	Debitage	Bipolar Flake	>75% Cortex	Quartz		2
F17-SOUTH HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		7
F17-SOUTH HALF	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		7
F17-SOUTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		21
F17-SOUTH HALF	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		2
F17-SOUTH HALF	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartzite		1
F17-SOUTH HALF	Fire-cracked Rock					18
F17-SOUTH HALF	Hafted Biface	Small Triangular Cluster	Complete	Quartz		1
F17-SOUTH HALF	Misc./Unmodified Stone			Bog Iron		1
F17-SOUTH HALF	Pipe					1
F17-SOUTH HALF	Rim Sherd	Cord Marked	Grit Tempered			1
F17-SOUTH HALF	Rim Sherd	Cord Marked	Sand Tempered			1
F17-SOUTH HALF	Rim Sherd	Cord Marked	Sand/Grit Tempered			1
F17-SOUTH HALF	Rim Sherd	Cord Marked	Sand/Grit Tempered			2
F17-SOUTH HALF	Rim Sherd	Eroded	Untempered			1
F17-SOUTH HALF	Rim Sherd	Plain/Cord Impressed	Sand/Grit Tempered			1
F17-SOUTH HALF	Rim Sherd	Plain/Cord Impressed	Sand/Grit Tempered			1
F17-SOUTH HALF	Rim Sherd	Smoothed	Sand/Grit Tempered			1
F17-SOUTH HALF	Rim Sherd	Smoothed	Sand/Grit Tempered			1
F17-SOUTH HALF	Rim Sherd	Unidentifiable	Sand Tempered			1
F17-SOUTH HALF	Shell					14
F17-SOUTH HALF	Unident. Ceramic					1
				Provenience Total:	538	
F19-SOUTH HALF						2
F19-SOUTH HALF	Bone					4
F19-SOUTH HALF	Misc./Unmodified Stone			Bog Iron		1
				Provenience Total:	7	
F20/SEC A						1
F20/SEC A	Bone					1
				Provenience Total:	2	
F21						19

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight (g)	Quantity
F21	Body Sherd	Cord Marked	Grit Tempered			2
F21	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F21	Bone					10
F21	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		2
F21	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
F21	Fire-cracked Rock					2
F21	Misc./Unmodified Stone			Limestone		1
					Provenience Total:	38
F22-SOUTH HALF						9
F22-SOUTH HALF	Bone					9
F22-SOUTH HALF	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		1
F22-SOUTH HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		4
F22-SOUTH HALF	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
F22-SOUTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		5
F22-SOUTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Steatite		1
F22-SOUTH HALF	Fire-cracked Rock					1
					Provenience Total:	31
F23/SEC A						5
F23/SEC A	Appendage	Plain/Punctate	Sand Tempered			1
F23/SEC A	Body Sherd	Cord Marked	Grit Tempered			1
F23/SEC A	Body Sherd	Fabric Impressed	Shell Tempered			1
F23/SEC A	Body Sherd	Unidentifiable	Shell Tempered			1
F23/SEC A	Bone					18
F23/SEC A	Debitage	Flake Frag./Shatter	Noncortical	Metavolcanic		1
F23/SEC A	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		2
F23/SEC A	Fire-cracked Rock					2
F23/SEC A	Shell					1
					Provenience Total:	33
F23/SEC B	Basal Sherd	Smoothed	Grit Tempered			1
F23/SEC B	Biface	Stage 4	Misc./Unident. Fragment	Quartz		1
F23/SEC B	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F23/SEC B	Body Sherd	Eroded	Sand Tempered			1
F23/SEC B	Body Sherd	Plain	Sand Tempered			1
F23/SEC B	Bone					36
F23/SEC B	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F23/SEC B	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F23/SEC B	Debitage	Flake Frag./Shatter	Noncortical	Quartz		6
F23/SEC B	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		1
F23/SEC B	Fire-cracked Rock					2
				Provenience Total:	52	
F24-NORTH HALF						2
F24-NORTH HALF	Bone					1
				Provenience Total:	3	
F24-SOUTH HALF	Body Sherd	Cord Marked	Grit Tempered			1
F24-SOUTH HALF	Bone					33
F24-SOUTH HALF	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F24-SOUTH HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		4
F24-SOUTH HALF	Debitage	Bipolar Flake	1-74% Cortex	Quartz		2
F24-SOUTH HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		1
F24-SOUTH HALF	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		1
F24-SOUTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		11
F24-SOUTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Unident. Chert		1
F24-SOUTH HALF	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		1
F24-SOUTH HALF	Misc./Unmodified Stone			Limestone		3
F24-SOUTH HALF	Pipe					1
F24-SOUTH HALF	Pipe					1
				Provenience Total:	61	
F25-NORTH HALF						75
F25-NORTH HALF	Basal Sherd	Smoothed	Sand/Grit Tempered			1
F25-NORTH HALF	Basal Sherd	Smoothed/Cord Impressed	Sand Tempered			1
F25-NORTH HALF	Basal Sherd	Unidentifiable	Sand/Grit Tempered			1
F25-NORTH HALF	Biface	Stage 3	Misc./Unident. Fragment	Quartz		1
F25-NORTH HALF	Body Sherd	Cord Marked	Grit Tempered			6
F25-NORTH HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			8
F25-NORTH HALF	Body Sherd	Smoothed	Grit Tempered			1
F25-NORTH HALF	Body Sherd	Smoothed	Sand/Grit Tempered			1
F25-NORTH HALF	Bone					124
F25-NORTH HALF	Core	Core Fragment		Quartz		1
F25-NORTH HALF	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		2
F25-NORTH HALF	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		7
F25-NORTH HALF	Debitage	Bipolar Flake	1-74% Cortex	Quartz		2
F25-NORTH HALF	Debitage	Bipolar Flake	>75% Cortex	Quartz		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F25-NORTH HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		2
F25-NORTH HALF	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		3
F25-NORTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		9
F25-NORTH HALF	Fire-cracked Rock					4
F25-NORTH HALF	Hafted Biface	Unidentified Type	Misc./Unident. Fragment	Quartz		1
F25-NORTH HALF	Rim Sherd	Cord Marked	Grit Tempered			1
F25-NORTH HALF	Rim Sherd	Smoothed	Sand/Grit Tempered			1
F25-NORTH HALF	Shell					32
F25-NORTH HALF	Unident. Ceramic					1
				Provenience Total:	286	
F25-SOUTH HALF						34
F25-SOUTH HALF	Basal Sherd	Smoothed	Grit Tempered			1
F25-SOUTH HALF	Body Sherd	Cord Marked	Grit Tempered			4
F25-SOUTH HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			4
F25-SOUTH HALF	Bone					30
F25-SOUTH HALF	Core	Bipolar		Quartz		1
F25-SOUTH HALF	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		1
F25-SOUTH HALF	Debitage	2ndry/Biface Thinning Flake	>75% Cortex	Quartz		1
F25-SOUTH HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		1
F25-SOUTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
F25-SOUTH HALF	Fire-cracked Rock					2
F25-SOUTH HALF	Other Formal Tool	Endscraper		Quartz		1
F25-SOUTH HALF	Shell					18
				Provenience Total:	99	
F26-NORTH HALF						8
F26-NORTH HALF	Body Sherd	Cord Marked	Grit Tempered			1
F26-NORTH HALF	Body Sherd	Cord Marked	Sand/Grit Tempered			1
F26-NORTH HALF	Bone					17
F26-NORTH HALF	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		2
F26-NORTH HALF	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
F26-NORTH HALF	Fire-cracked Rock					1
F26-NORTH HALF	Rim Sherd	Plain/cord-wrapped Dowel	Sand/Grit Tempered			1
				Provenience Total:	32	
F26-SOUTH HALF						4
F26-SOUTH HALF	Bone					8
F26-SOUTH HALF	Misc./Unmodified Stone			Bog Iron		1

Provenience	Class	Subclass 1	Subclass 2	Raw Material	Weight(g)	Quantity
F26-SOUTH HALF	Pipe					1
				Provenience Total:	14	
GENERAL SURFACE	Body Sherd	Cord Marked	Sand/Grit Tempered			1
GENERAL SURFACE	Body Sherd	Cord-wrapped Dowel	Sand/Grit Tempered			1
GENERAL SURFACE	Debitage	Bipolar Flake	1-74% Cortex	Quartz		1
GENERAL SURFACE	Debitage	Flake Frag./Shatter	Noncortical	Quartz		1
GENERAL SURFACE	Pipe					1
GENERAL SURFACE	Rim Sherd	Cord Marked/Cord Impressed	Sand/Grit Tempered			1
				Provenience Total:	6	
PLOWZONE SPOIL						137
PLOWZONE SPOIL	Biface	Stage 2	Complete	Quartz		2
PLOWZONE SPOIL	Body Sherd	Cord Marked	Sand/Grit Tempered			1
PLOWZONE SPOIL	Bone					44
PLOWZONE SPOIL	Core	Bipolar		Quartz		1
PLOWZONE SPOIL	Debitage	2ndry/Biface Thinning Flake	1-74% Cortex	Quartz		3
PLOWZONE SPOIL	Debitage	2ndry/Biface Thinning Flake	Noncortical	Quartz		16
PLOWZONE SPOIL	Debitage	Bipolar Flake	1-74% Cortex	Quartz		4
PLOWZONE SPOIL	Debitage	Flake Frag./Shatter	1-74% Cortex	Quartz		7
PLOWZONE SPOIL	Debitage	Flake Frag./Shatter	>75% Cortex	Quartz		7
PLOWZONE SPOIL	Debitage	Flake Frag./Shatter	Noncortical	Quartz		24
PLOWZONE SPOIL	Debitage	Flake Frag./Shatter	Noncortical	Silicified Slate		1
PLOWZONE SPOIL	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartz		3
PLOWZONE SPOIL	Debitage	Primary/Reduction Flake	1-74% Cortex	Quartzite		1
PLOWZONE SPOIL	Fire-cracked Rock					11
PLOWZONE SPOIL	Misc./Unmodified Stone			Limestone		1
PLOWZONE SPOIL	Pipe					1
PLOWZONE SPOIL	Shell					2
				Provenience Total:	266	
				Site Total:	22134	

APPENDIX B

POTOMAC CREEK ARCHAEOBOTANY: ANALYSIS OF FLOTATION-RECOVERED AND HAND-COLLECTED PLANT REMAINS FROM THE POTOMAC CREEK SITE (44ST2)

Prepared by:
Justine Woodard McKnight

INTRODUCTION

Although archaeological research at the Potomac Creek Site (44ST2) has been ongoing since the 1930s, it has largely ignored the potential contribution of archaeologically deposited plant remains to an understanding of site form, function, and economy. This is due to the fact that the majority of research accomplished at the site was undertaken prior to the widespread use of flotation processing to recover archaeological plant materials. The following limited study of macrofloral remains constitutes the first systematic sampling and analysis of such remains at the site—or indeed from any other site directly relating to the Potomac Creek Complex. In exploring human-plant relationships at the Potomac Creek Site, we benefit from the unique combination of pertinent ethnographic accounts (Barbour 1986; Lorant 1946; Quinn 1955; Strachey 1967), early archaeological investigation (Schmitt 1952,1965; Stephenson et al. 1961; Stewart 1992), and the now well developed "flotation age" of macrofloral recovery and analysis.

Recovered archaeological plant material represents a range of potentially interesting relationships between site occupants and their environment. Current research at the Potomac Creek Site prescribes the assessment of plant materials recovered from archaeological contexts as cultural artifacts, and relies on a systematic sampling strategy and thorough analysis of archaeobotanical materials to advance an understanding of the Potomac Creek complex. Primary research focuses on (1) establishing the subsistence patterns of site occupants and (2) advancing an understanding of site function.

Although the full range of plant remains deposited prehistorically is not accurately represented in the small complement of carbonized botanical remains recovered through flotation (only a limited and very biased sample emerges from deposition, preservation, disturbance, and recovery), significant results can be obtained through careful field sampling, adequate flotation processing and analysis, and judicious interpretation of the resulting archaeobotanical data. Grains, vegetables, fruits, nuts and tubers /roots, both gathered from the natural environment and cultivated, have played an important role in Late Woodland subsistence economies (Scarry 1993). Significant dietary reconstruction can be realized through careful interpretation of data obtained through paleoethnobotanical analysis where organic preservation prevails. An understanding of prehistoric textile manufacturing, medicinal application, building material, and fuel supply is augmented through analysis of archaeobotanical assemblages. Identification of wood charcoal can also be employed to investigate patterns of fuel wood selection, to reflect environmental disturbance, and to augment vegetation reconstruction for the period of site occupation (Ford 1979, 1981, 1985)**.**

It has been noted that adequate archaeobotanical evidence from the Middle Atlantic region is sorely lacking (Fritz 1990; Scarry 1993; Yarnell and Black 1985). However, growing archaeobotanical research over much of the Eastern Woodlands is beginning to compile a framework of data within which relative trends or patterns in the composition, quantity, and association of floral remains can be assessed. Adding to this data base and examining the relative changes in the archaeobotanical record is a critical to elucidating trends in Woodland period plant utilization throughout the Middle Atlantic region. It is to this end that archaeobotanical investigations were undertaken at the Potomac Creek Site.

METHODOLOGY

During field excavation, macrobotanical samples were systematically collected through routine soil sampling. Soil samples were collected from all identified feature contexts. Soil samples of a standard volume (usually measuring 3 liters) were retained. Thirty-two soil samples totaling 96 liters were collected. Of these, 20 samples representing 16 different features (Features 1,3, 4, 5/6, 6/7, 8, 9, 11, 12, 14, 15, 17, 18, 19, 25, and 26) were selected for flotation processing and analysis based on their potential for yielding information relative to prehistoric subsistence at the site. A total of 56 liters of feature fill was analyzed.

Soil samples were individually processed using a Flote-Tech flotation system equipped with 0.325-mm fine fraction and 1.0-mm coarse fraction screens. The Flote-Tech system is a multi-modal flotation system that facilitates the separation and recovery of charcoal from the soil matrix via agitation in water. Processing results in three size fractions: heavy, medium, and light. Floated portions were air dried. Each floated soil sample contained a variety of artifacts and geologic materials that were removed by hand for analysis. All carbonized plant remains recovered through flotation were combined and passed through a 2-mm geological screen, yielding fractions of two different sizes for analysis. Weights and sample descriptions of the resulting ≥2-mm and <2-mm fractions were recorded. The ≥2-mm charcoal specimens were examined under low magnification (10X to 30X) and sorted into general categories of material (i.e., wood, nut, maize, amorphous charcoal, etc.). Description, count, and weight were taken for each category of the ≥2-mm material. The <2-mm size fractions were examined under low magnification and their general description recorded; any remains of seeds and cultivated plants encountered were removed for identification.

Identifications were routinely attempted on all seed, nut, and cultivated plant remains, and on a subsample of 20 randomly selected wood fragments from each sample, in accordance with standard practice (Pearsall 1989). Identifications of all classes of botanical remains were made to the genus level when possible, to the family level when limited diagnostic morphology was available, and to the species level only when the assignment could be made with absolute certainty. When botanical specimens were found to be in such eroded or fragmentary condition as to prevent their complete examination or recognition, a variety of general categories were assigned to reflect the degree of examination and identification possible. General wood categories within the Potomac Creek assemblage include "ring porous", where specimens exhibited differences between early and late wood growth; "diffuse porous", where specimens exhibited homogenous growth within annual rings; "deciduous taxa", where specimens could be identified as having a porous vessel arrangement reflecting deciduous trees rather than a trachid arrangement indicative of coniferous taxa; and "unidentifiable" , where specimens were so fragmentary or minute that no clear section could be obtained upon which to base identification. Seed categories within the site assemblages include: "unidentifiable", where specimens were highly eroded and lacking the minute structures required for identification (i.e., seed coat, embryo placement). The category "amorphous carbon" was used in this report to classify carbonized remains that lacked any suitable characteristics whatsoever upon which to base any identification.

All identifications are routinely made under low magnification (10X to 30X) with the aid of standard texts (Kozlowski 1972; Martin and Barkely 1961; Panshin and deZeeuw 1970; Schopmeyer 1974), and checked against plant specimens from a modern reference collection germane to the flora of Stafford County, Virginia. Specimen weights were taken using a Metzler electronic balance accurate to 0.01 g.

RESULTS OF ANALYSIS

Overall, preservation of organic remains from 44ST2 was excellent. No evidence of modern seed contamination was observed—only very low numbers of fresh seeds that might indicate vertical seed dispersion (via plowing, rodent burrowing, root action, down washing) (Keepax 1977; Minnis 1981; E. Smith 1985) were noted. Flotation processing of 56 liters of soil from feature contexts yielded 46.48 g of carbonized plant remains, or an average density of 0.83 g of charcoal per liter of feature fill analyzed. A variety of wild and cultivated plant remains were recovered from 44ST2. These include both deciduous and coniferous wood charcoal; a variety of nuts; small numbers of ruderal seeds; the remains of the Meso-American cultigens maize, beans, and squash; and miscellaneous plant materials including fungal fructifications and unidentifiable rind fragments. Results of analysis of these flotation recovered remains are presented in Table B-1, and a detailed account of taxa represented is provided below.

Wood charcoal was the most abundant class of material recovered, comprising 77% (by weight) of the site sample. A total of 23,914 wood fragments weighing 35.65 g was recovered. Of the total wood remains, a subsample

Provenience	**Fea. 1 Sct. E**	**Fea. 1 Sct. F**	**Fea. 3 Sct. B**	**Fea. 4 Sct. B**	**Fea. 5/6 Sct. D**	**Fea. 6/7 Sct. B**	**Fea. 8 Sct. A**	**Fea. 9 Sct. B**	**Fea. 11 Sct. B**	**Fea. 12 East ½**
Soil Sample Volume	3 liters	3 liters	3 liters	3 liters	3 liters	3 liters	3 liters	3 liters	3 liters	3 liters
Total weight of carbonized material	6.81 g	2.24 g	0.49 g	0.72 g	0.53 g	0.47 g	0.33 g	0.37 g	0.44 g	8.8 g
Wood - carbonized (Total count/weight)	6,097/ 6.12 g	698/ 1.75 g	33/ 0.32 g	92/ 0.53 g	73/ 0.47 g	91/ 0.46 g	30/ 0.27 g	30/ 0.25 g	34/ 0.39 g	2,642/ 7.50 g
Acer/Betula (maple/birch)	3				2		3			
Carya spp. (hickory)	5	9	1	9	12	4	12	3	6	16
Castanea dentata (American Chestnut)				4	1					
Celtis occidentalis (hackberry)										
Diospyros virginiana (persimmon)										
Juglans nigra (black walnut)										1
Juniperus virginiana (Eastern red cedar)										
Maclura pomifera (osage orange)					2					
Morus rubra (red mulberry)										
Pinus sp. (Southern pine group)										
Quercus sp. (oak)		1	6		1	1			1	
Quercus sp. (oak) ERYTHROBALANUS		2				1				
Quercus sp. (oak) LEUCOBALANUS	8		7			7	1	8	10	
Robinia pseudoacacia (black locust)		4		1		5		1		

Table B-1, part 1 (Features 1 through 12, East ½). Potomac Creek Site (44ST2), flotation-recovered botanical remains (continues next page).

Provenience	**Fea. 1 Sct. E**	**Fea. 1 Sct. F**	**Fea. 3 Sct. B**	**Fea. 4 Sct. B**	**Fea. 5/6 Sct. D**	**Fea. 6/7 Sct. B**	**Fea. 8 Sct. A**	**Fea. 9 Sct. B**	**Fea. 11 Sct. B**	**Fea. 12 East ½**
Ulmus sp. (elm)								1		
DIFFUSE POROUS	1		1							1
RING POROUS	1						1			
DECIDUOUS TAXA		2	2	2	2	2	2	2		1
UNIDENTIFIABLE	2	2	3	4			1	5	1	1
Nutshell (Total count/weight)	30/0.59 g	8/0.14 g	4/0.15 g	7/0.17 g	2/0.04 g	1/<0.01 g	4/0.03 g	1/0.02 g	0	68/1.19 g
Carya sp. (hickory-thick walled)	27/0.55 g	8/0.14 g	3/0.10 g	7/0.17 g	2/0.04 g		4/0.03 g	1/0.02 g		68/1.19 g
Carya sp. (hickory-thin walled)	2/0.02g									
Juglans nigra (black walnut)	1/0.02g									
Quercus sp. (oak/acorn)						1/<0.01 g				
possible nutmeat			1/0.05 g							
JUGLANDACEAE										
Seeds (Total count)	1	1	1	0	1	0	6	1	2	2
Chenopodium sp. (goosefoot)							3			1
Phytolacca americana (poke)			1		1		2	1	2	1
Vitis sp. (grape)										
AMARANTHACEAE (pigweed family)										
GRAMINEAE (grass family)										
Unknown monocot seed fragment		1								
UNIDENTIFIABLE	1						1			

Table B-1, part 1 (Features 1 through 12, East ½). Potomac Creek Site (44ST2), flotation-recovered botanical remains (continues next page).

Provenience	**Fea. 1 Sct. E**	**Fea. 1 Sct. F**	**Fea. 3 Sct. B**	**Fea. 4 Sct. B**	**Fea. 5/6 Sct. D**	**Fea. 6/7 Sct. B**	**Fea. 8 Sct. A**	**Fea. 9 Sct. B**	**Fea. 11 Sct. B**	**Fea. 12 East ½**
TROPICAL CULTIGENS (Total count)	2	29	1	2	0	0	13	0	0	5
Cucurbita sp. (squash seed)										
Phaseolus vulgaris (common bean)	1									
Zea mays (corn/maize)										
Kernel		1								
Kernel fragment				2						
Cupule	1	12								
Cupule fragment		16	1				13			5
possible cob fragment										
OTHER REMAINS (Total count/weight)										
amorphous charcoal	13/0.10	94/0.24 g	1/0.01 g	1/0.01 g	2/0.02 g	1/0.01 g	0	1/0.09 g	2/0.04 g	24/0.04 g
fungal fructification		1/<0.01 g		1/0.02 g						3/0.01 g
rind fragment	2/0.02 g	1/<0.01 g					1/0.01 g			2/0.02 g
striated rind fragment	1/0.01 g									

Table B-1, part 1 (Features 1 through 12, East ½). Potomac Creek Site (44ST2), flotation-recovered botanical remains.

Provenience	Fea. 12 West ½	Fea. 14 East ½	Fea. 15 East ½	Fea. 15 West ½	Fea. 17 North ½	Fea. 17 South ½	Fea. 18 Sct. B	Fea. 19 Sct. B	Fea. 25 North ½	Fea. 26 South ½	TOTAL 20 Samples
Soil Sample Volume	3 liters	3 liters	3 liters	3 liters	3 liters	3 liters	1 liter	1 liter	3 liters	3 liters	56 liters
Total weight of carbonized material	9.28 g	2.94 g	1.21 g	1.66 g	1.45 g	1.59 g	0.34 g	0.17 g	3.61 g	3.03 g	46.48 g
Wood - carbonized (Total count/weight)	4,992/ 5.05 g	136/ 1.25 g	745/ 0.99 g	596/ 1.47 g	1,037/ 1.38 g	802/ 1.42 g	28/ 0.27 g	15/ 0.12 g	3,291/ 2.93 g	2,452/ 2.71 g	23,914/ 35.65 g
Acer/Betula (maple/birch)		2					3				13
Carya spp. (hickory)	3	2	8	2	5	7	5	5	2		116
Castanea dentata (American Chestnut)	2		3	4		3	3		4		24
Celtis occidentalis (hackberry)										5	5
Diospyros virginiana (persimmon)	2										2
Juglans nigra (black walnut)	2			3							6
Juniperus virginiana (Eastern red cedar)					3					7	10
Maclura pomifera (osage orange)	1										3
Morus rubra (red mulberry)		4					2				6
Pinus sp. (Southern pine group)									1		2
Quercus sp. (oak)	5	2								1	19

Table B-1, part 2 (Features 12, West ½ through 26, South ½). Potomac Creek Site (44ST2), flotation-recovered botanical remains (continues next page).

Provenience	**Fea. 12 West ½**	**Fea. 14 East ½**	**Fea. 15 East ½**	**Fea. 15 West ½**	**Fea. 17 North ½**	**Fea. 17 South ½**	**Fea. 18 Sct. B**	**Fea. 19 Sct. B**	**Fea. 25 North ½**	**Fea. 26 South ½**	**TOTAL 20 Samples**
Quercus sp. (oak) ERYTHROBALANUS						1					4
Quercus sp. (oak) LEUCOBALANUS			6	6	5	4	1		5	3	71
Robinia pseudoacacia (black locust)		3			3			2	2	1	24
Ulmus sp. (elm)		1			1						3
DIFFUSE POROUS									2		5
RING POROUS				1	3	2	1			2	11
DECIDUOUS TAXA	4	6	2	2		3	1	3	2	1	39
UNIDENTIFIABLE	1		1	2			4	4	2		33
Nutshell (Total count/weight)	241/4.20 g	61/1.66 g	6/0.15 g	17/0.18 g	5/0.03 g	2/0.06 g	4/0.06 g	2/0.04 g	16/0.26 g	17/0.25 g	496/9.22 g
Carya sp. (hickory-thick walled)	241/4.20 g	61/1.66 g	5/0.14 g	15/0.16 g	5/0.03 g	2/0.06 g	4/0.06 g	2/0.04 g	14/0.16 g	11/0.20 g	480/8.95 g
Carya sp. (hickory-thin walled)											2/0.02 g
Juglans nigra (black walnut)			1/0.01 g	1/0.02 g					2/0.10 g	4/0.03 g	9/0.18 g
Quercus sp. (oak/acorn)				1/<0.01g							2/<0.01 g
possible nutmeat											1/0.05 g
JUGLANDACEAE										2/0.02 g	2/0.02 g

Table B-1, part 2 (Features 12, West ½ through 26, South ½). Potomac Creek Site (44ST2), flotation-recovered botanical remains (continues next page).

Provenience	Fea. 12 West ½	Fea. 14 East ½	Fea. 15 East ½	Fea. 15 West ½	Fea. 17 North ½	Fea. 17 South ½	Fea. 18 Sct. B	Fea. 19 Sct. B	Fea. 25 North ½	Fea. 26 South ½	TOTAL 20 Samples
Seeds (Total count)	1	1	0	1	2	3	0	0	0	2	25
Chenopodium sp. (goosefoot)	1				1	1					7
Phytolacca americana (poke)		1									9
Vitis sp. (grape)					1	1				2	4
AMARANTHACEAE (pigweed family)				1							1
GRAMINEAE (grass family)						1					1
Unknown monocot seed fragment											1
UNIDENTIFIABLE											2
TROPICAL CULTIGENS (Total count)	9	0	4	0	0	0	1	1	2	2	71
Cucurbita sp. (squash seed)	1										1
Phaseolus vulgaris (common bean)	1		2								4

Table B-1, part 2 (Features 12, West ½ through 26, South ½). Potomac Creek Site (44ST2), flotation-recovered botanical remains (continues next page).

Provenience	**Fea. 12 West ½**	**Fea. 14 East ½**	**Fea. 15 East ½**	**Fea. 15 West ½**	**Fea. 17 North ½**	**Fea. 17 South ½**	**Fea. 18 Sct. B**	**Fea. 19 Sct. B**	**Fea. 25 North ½**	**Fea. 26 South ½**	**TOTAL 20 Samples**
Zea mays (corn/maize)											
Kernel											1
Kernel fragment	1						1	1			5
Cupule									2		15
Cupule fragment	2		2							2	41
possible cob frags.	4										4
OTHER REMAINS (Total count/weight)											
amorphous charcoal	12/0.03 g	2/0.02 g		2/0.01 g	5/0.04 g	6/0.09 g			46/0.38 g	16/0.07 g	228/1.20 g
fungal fructification			3/0.02 g			2/0.02 g					10/0.07 g
rind fragment											6/0.05 g
striated rind fragment											1/0.01 g

Table B-1, part 2 (Features 12, West ½ through 26, South ½). Potomac Creek Site (44ST2), flotation-recovered botanical remains.

of 395 fragments (a maximum of 20 fragments per sample) was randomly selected for identification. The site wood sample revealed a predominance of hickory (*Carya sp.*) (29% of the identified subsample, by count), white oak (*Quercus sp.* [*LEUCOBALANUS group*]) (18%), and American chestnut (*Castanea dentata*) (6%). Also identified were minor quantities of black locust (Robinia pseudoacacia) (6%), unclassified oak (*Quercus sp.*) (5%), Eastern red cedar (*Juniperus virginiana*) (3%), maple or birch (*Acer/Betula*) (3%), black walnut (*Juglans nigra*) (2%), red mulberry (Morus rubra) (2%), hackberry (*Celtis occidentalis*) (1%), and (*Quercus sp. [ERYTHROBALANUS group]*) (1%). The following species were identified in less than 1% of the subsample: persimmon (*Diospyros virginiana*), osage orange (*Maclura pomifera)*, southern pine species (*Pinus sp.*), and elm (*Ulmus sp.*). Poorly preserved specimens were assigned to the categories "diffuse porous" (1%), "ring porous" (3%), "deciduous taxa" (10%), or "unidentifiable" (8%) due to the small and eroded nature of the specimens.

Nutshell remains were recovered from all 20 feature samples analyzed. A total of 496 nutshell fragments weighing 9.22 g were identified, representing four distinct species. Thick-walled hickory (*Carya sp.*) remains dominated the nutshell assemblage, accounting for approximately 97% (by weight) of the total flotation-recovered nutshell. Three hundred ninety-six fragments weighing 6.83 g were identified as hickory (*Carya sp*.) of the thick-shelled type. The thick-shelled or "true hickory" group native to the project area includes mockernut (*Carya tomentosa*), shagbark hickory (*C. ovata*), and shellbark hickory (*C. lacinosa*). Thin-walled hickory nut (*Carya sp.*) was identified from a single sample from Feature 1, amounting to two fragments weighing 0.02 g, or <1% of the total nutshell recovered from the site. Thin-walled or "pecan hickories" native to the coastal plain of Virginia include water hickory (*C. Aquatica*) and bitternut (*C. cordiformis*). The remains of black walnut (*Juglans nigra*) were present in small quantities from 25% of the features sampled, totaling nine fragments weighing 0.18 g (approximately 3% of the total nutshell). Two minute acorn fragments (*Quercus sp.*) were recovered from Features 6/7 and 15. Two nutshell fragments were identified simply to the walnut family (*JUGLANDACEAE*). These specimens were too fragmentary to permit a more detailed identification. One possible nutmeat fragment was identified from Feature 3.

Recovered seed remains were limited in quantity and variety. A total of 25 specimens was identified, with seed remains being present in 14 of the 20 flotation samples analyzed. Grape (*Vitis sp.*) seeds were recovered, with a site total of four seeds. Seven specimens of chenopod (*Chenopodium sp.*) were identified. These specimens appear to be wild-type chenopods, each having a thick testa measuring more than 50 microns in thickness (B. Smith 1985). Nine poke (*Phytolacca americana*) seeds were recovered. A variety of other seeds were identified as belonging to the amaranth or pigweed *(AMARANTHACEAE)* (1 seed) and grass *(GRAMINEAE)* (1 seed) families. One seed fragment was identifiable only as a monocot. Two seeds from the assemblage were "unidentifiable" as a result of their severely eroded condition.

Meso-American cultigens were recovered from 12 of the 20 analyzed samples (from 10 of the 16 features represented). Maize (*Zea mays*), domesticate bean (*Phaseolus vulgaris*), and squash (*Cucurbita sp.*) remains were recovered. Maize remains include a single whole kernel; 15 intact cupules; 41 cupule fragments (or partial cupules); 5 kernel fragments; and 4 possible fragments of general corn cob material. Maize remains were most common within the Feature 1, Feature 8, and Feature 12 samples, with minor amounts of corn remains identified from Features 3, 4, 15, 18, 19, 25, and 26. A total of four specimens of domesticate bean were identified from Features 1, 12, and 15 . A single, small squash seed was recovered from Feature 15.

A variety of miscellaneous archaeobotanical materials were identified within the 44ST2 assemblage. These include 228 amorphous charcoal fragments (weighing 1.20 g), 10 fungal fructifications (weighing 0.07 g), 6 fragments of rind material (weighing 0.05 g), and a single striated rind or husk fragment (weighing 0.01 g).

In addition to the flotation-recovered plant remains analyzed, nine hand-collected charcoal samples were examined, and their general composition and weight noted. These hand-collected specimens were from the same features as the analyzed flotation samples. These samples are composed of wood charcoal (various species), hickory (*Carya sp.*), and black walnut (*Juglans nigra*) nutshell, and a domesticate bean *(Phaseolus vulgaris)*. Charcoal weight totals 45.04 g. The presence of general classes of plant remains represented in these samples is presented in Table B-2.

Flotation Sample Provenience	Fea. 1 Sct. E	Fea. 1 Sct. I	Fea. 1 Sct. F	Fea. 12 East ½	Fea. 12 West ½	Fea. 15 West ½	Fea. 15 East ½	Fea. 25 North ½	Fea. 26 South ½	TOTAL
Total Charcoal Weight (g)	**0.97 g**	**0.12 g**	**9.54 g**	**11.48 g**	**3.28 g**	**1.51 g**	**9.02 g**	**8.46 g**	**0.66 g**	**45.04 g**
WOOD CHARCOAL	✓		✓ predominant	✓	✓	✓	✓	✓	✓ predominant	✓
NUTSHELL										
Carya sp. (thick walled)	✓		✓	✓	✓ predominant		✓		✓	✓
Juglans nigra	✓ predominant									✓
OTHER REMAINS										
Phaseolus vulgaris Common Bean		✓								✓
✓ *indicates the presence of particular class of plant remains*										

Table B-2. Potomac Creek Site (44ST2), presence of general classes of plant remains from hand-collected charcoal samples.

DISCUSSION OF CULTURALLY SIGNIFICANT WILD TAXA REPRESENTED

Hickory *(Carya sp.)*

The hickories (*Carya sp.*) include a variety of native species divided generally into two types, the "true" or "thick-walled" hickories, and the "pecan" or "thin-walled" hickories (Panshin and deZeeuw 1970:541). These species occupy a variety of ecological zones and produce a heavy nut crop that ripens during September and October (Munson 1986). The hickory has been a dominant tree in the oak/hickory forest of the Chesapeake Bay region since the onset of the Holocene. The prevalence of hickory remains from prehistoric archaeological contexts attests to the importance of the species to human subsistence and the accessability of the resource to local populations. It is estimated that minimum annual hickory nut yields average 30,000 bushels per square mile on upland forests of the Lower Illinois River Valley (Zawacki and Hausfater 1969:63)—this figure offers an adequate model by which to *roughly* gauge the quantity of mast for the Potomac River Valley. Hickory nuts (referred to as "walnuts") are mentioned in early historic accounts of Algonquian diets (Lorant 1946:250; Quinn 1955:351), and the prevalence of hickory trees in the Virginia forest is noted by Hariot: "...there are vary many walnuts; we saw some growing above fourscore feet, straight and without a bough. They make excellent timber four or five fathoms long" (Lorant 1946:256). Hickory wood has a high caloric value and serves as an excellent firewood (Graves 1919).

Oak (*Quercus sp.*)

Wood fragments belonging to both the red and white oak groups were encountered within the assemblage. Although segregation of the particular species of oak is not possible based on their minute anatomy (Panshin and deZeeuw 1970:586–587), the structure of these two groups of the genus *Quercus* can be accurately identified. The red oak group *(ERYTHROBALANUS)* contains such species as southern red oak (*Quercus rubra*), black oak (*Quercus velutina*), shumard oak (*Quercus shumardii*), scarlet oak (*Quercus coccinea*), pin oak (*Quercus palustris*), and willow oak (*Quercus phellos*). The white oak group *(LEUCOBALANUS)* contains such species as white oak (*Quercus alba*), bur oak (*Quercus macrocarpa*), post oak (*Quercus stellata*), and overcup oak (*Quercus lyrata*). The presence of oak species within this archaeobotanical assemblage is consistent with the regional forest cover of the region for the period of site occupation.

The acorns of many oak species were relied upon as a food resource by historic Indian groups. Acorn nutmeats were roasted and ground for use as a beverage, used as a source of oil, or ground or pounded to make a meal (Smith 1923:66, Yanovsky 1936:18–19). Hariot reports five different sorts of berries or acorns growing on trees (Lorant 1946:252) and describes the process of drying the nuts upon a fire on a hurdle made of reeds. When needed, the dried nutmeats were soaked until soft, then boiled, and eaten raw or pounded into bread. Acorns of various species would have been available from August through October from a variety of ecological zones occupying the Potomac River region. Oak species exhibit positive qualities for construction, tool and implement manufacture, and for firewood (Panshin and deZeeuw 1970; Graves 1919).

American Chestnut (*Castanea dentata*)

American chestnut is nearly extinct today due to the chestnut blight disease caused by the ascomycete fungus *Endothia parasitica*. The fungus was introduced to New York City in 1904 (Little 1980) and quickly decimated the American chestnut throughout the Eastern Woodlands of the United States. *Castanea dentata* was once a major component in the oak/chestnut forest dominating piedmont areas of the Chesapeake Bay region, and a minor component in the oak/hickory forests of the coastal plain. Early historic accounts of tidewater Virginia mention the great abundance of American chestnut trees in some areas, and contain descriptions of the preparation and consumption of chestnuts by native inhabitants. The nuts were either eaten raw or crushed and boiled to extract the oil, with the boiled nutmeats used to make a bread dough (Barbour 1986; Lorant 1946:250). Historically, chestnut lumber made durable fence posts and lasting rails and was used in the construction of homes and outbuildings. The species also provided the principal domestic source of tannin for the preparation of animal hides for leather. The species is poor as a fuel source (Graves 1919).

Eastern Red Cedar (*Juniperus virginiana*)

Eastern red cedar is renowned for its attractive color, durability, excellent working qualities, fragrance, and reputed insect-repelling properties (Panshin and deZeeuw 1970:499–500). The wood is extremely durable and has been the preferred taxon for fenceposts and pole-built structures throughout historic times. The bark of the Eastern red cedar was used by the Ojibwa and Potawatomi for weaving mats and bags, and by the Missouri River Indians in constructing shelters (Gilmore 1919:11; Smith 1928:234). Ethnohistorical accounts also document the use of cedar for a variety of medicinal purposes (Tehon 1951:195). The species has been identified with possible ritual importance from late prehistoric (Mississippian) settlements in Illinois (Johannessen 1984; Whalley 1982).

Black Locust (*Robinia pseudoacacia*)

This medium-sized leguminous tree would not have been common on Virginia's coastal plain during prehistoric times. Little (1980:522) reports that Virginia Indians "made bows of the wood and apparently planted the tree eastward." The tree produces edible flowers in April, and the ensuing young pods are also edible. Medsger (1966:121) states that the seeds of the black locust were gathered and cooked (like peas or beans) by Native Americans. The wood of the locust tree is hard, strong, very durable in contact with the soil, and makes excellent fuel.

Black Walnut (*Juglans nigra*)

Black walnut nutmeats were heavily relied upon and favored by historic Indian tribes throughout the range of the species (Gilmore 1919:74; Yanovsky 1936:17). Hariot comments on the use of black walnuts in his accounts of Virginia: "The kernels of the fruit are very oily and sweet. The inhabitants either eat them or make a milk of them by breaking the nuts with stones and grinding the powder in a mortar with water. This they add to their spoon-meat, their boiled wheat, pease, beans, and pumpkins, thus giving the food a far more pleasant taste" (Lorant 1946:250). Nutmeats would have been available for harvest during September and October from local woodlands. Husks of the black walnut provide a rich, durable purple/brown dye for fabric, leather, and basketry (Brooklyn Botanic Garden 1964:29).

Hackberry (*Celtis occidentalis*)

This member of the elm family is fairly common in both moist and dry woodlands throughout the project area. The tree bears an edible drupe, also known as sugarberry, which was used by many historic Indian tribes to flavor meat or mix with parched corn and fat (Gilmore 1919:76; Lust 1974:536; Smith 1928:265; Yanovsky 1936:19). Hackberries are ripe and available during October and November, and could have been used fresh by the Late Woodland inhabitants of the Potomac Creek Site, or dried and stored for later use. The wood of the hackberry tree is only moderately hard, but can serve as a fuel source.

Maple/Birch (*Acer/Betula*)

Maple and birch species are often hard to distinguish based on their minute structure. Members of each genus would have been a minor forest component in the native landscape of pre-colonial Virginia, each more common to moist valleys and floodplain areas than to upland woods. Hariot's accounts mention the use of maple for fashioning bows (Lorant 1946:258).

Red Mulberry (*Morus rubra*)

This native tree is often described as spreading and shrub-like, but can grow to 70 ft. in height and over 4 ft. in diameter in the southern Appalachians (Peattie 1991). The tree bears numerous small fruits, which form a multiple fruit that ripens in the summer months. The fruits are edible and delicious fresh or dried (Medsger 1966). The fruits are also a favorite food for many songbirds, which aid in propagating the trees along field edges and fence lines. Early historic accounts mention the manufacture of cloaks from the pounded inner bark of young mulberry shoots. Red mulberry lumber was used locally for fence posts; furniture, interior carpentry, wagon stock, caskets, and cooperage (Panshin and deZeeuw 1970:579).

Persimmon (*Diospyros virginiana*)

Persimmon wood exhibits inherent hardness, strength, and toughness, and it has the unique ability to stay smooth under friction (Panshin and deZeeuw 1970:621), making it well suited for various kinds of tool manufacture and construction. The fruit of the persimmon is the "putchamins" observed by Capt. John Smith (Barbour 1986:152) and the "pessemmins" noted by Strachey (1967:120). The fruits were eaten fresh when they ripened during the months of October and November, and were dried and stored for later use (Barbour 1986:152).

Osage Orange (*Maclura pomifera*)

The wood of the osage orange possesses valuable properties of strength and durability and exhibits minimal shrinking and swelling when worked (Panshin and deZeeuw 1970:581). This wood was preferred for fashioning treenails, fence posts, and making bows (hence the alternate name for the species "bodark" from the French *bois d'arc* meaning "bow-wood"). The wood and bark contain yellow, green, and brown coloring agents used as a dye for fiber and leather (Bliss 1981:7; Brooklyn Botanic Garden 1964:26). The native range of osage orange is uncertain (Little 1980:430), though the species has been widely naturalized.

Pine (*Pinus sp.*)

Pine fragments recovered from 44ST2 are fragments of yellow or hard pine species. These pines of the Southern and Eastern United States cannot be separated on the basis of minute wood structure (Panshin and deZeeuw 1970:456–457). The Southern pine group includes the following species: longleaf pine (*Pinus palustris*), shortleaf pine (*Pinus echinata*), loblolly pine (*Pinus taeda*), slash pine (*Pinus elliottii*), pitch pine (*Pinus rigida*), and pond pine (*Pinus serotina*). Contemporary lumber trade classifies Southern pines according to structural density, with longleaf and slash pines frequently exhibiting multiple late-wood bands measuring up to 0.2 in. in diameter compared to 0.1 in. or less for other Southern pines (Kukachka 1960:43:887–896). Such classification does not translate well to pine specimens recovered from archaeological contexts, as considerable shrinkage and other quantitative modification to the wood structure over time is common. Although pine species are common throughout the project area today, it has been suggested (Brown et al. 1986:753) that pine was not a major component in native forests. It is speculated that prevalence of pine species in the region has increased considerably as a result of historic clearing of native hardwood forests.

Elm (*Ulmus sp.*)

This deciduous hardwood was once prevalent throughout valleys and floodplains in mixed hardwood forests. The American elm *(Ulmus americana)*, once abundant, has been ravaged by the Dutch Elm disease, caused by a fungus accidentally introduced from Europe about 1930 and spread by elm bark beetles. Slippery elm *(Ulmus serotina)* is also native to Virginia, scattered with other species in mixed hardwood forests. The thick and fragrant inner bark of slippery elm can be dried and afterwards moistened for use as a poultice or cough medicine. The wood of these elm species is useful though unremarkable for construction, and is rated mediocre to poor as a fuel wood (Graves 1919).

Grape (*Vitis sp.*)

Strachey (1967:121) comments on the great variety and quantity of wild grapes observed in Virginia: "To behold the goodly vynes, burthening every neighbour-bush and clymbing the toppes of highest trees, and those full of Clusters of grapes in their kynd how over-dreepend and shadowed soever from the Sun and though never pruned or manured. I day say yt that we havu eaten there as full and lusheous a Grape as in the villages betweene Paris and Amiens, and I haue drunck often of the rath [early] wine. . ." The English interest in spurring a wine industry in the Virginia colonies, like the delusion of silk production, persisted from the earliest days of European contact.

FLORAL SUMMARY

The pattern of plant remains from the Potomac Creek Site appears to reflect a dual adaptation, where a reliance on wild plant resources from the variety of micro-environmental zones near the site supplemented an established horticultural economy. It should be kept in mind that only a very limited sample of archaeological plant remains recovered during recent excavations at 44ST2 was submitted for analysis, and that these remains are by no means representative of the total spectrum of plants used by the aboriginal inhabitants of the site. This is due, in part, to the preservational biases inherent in paleoethnobotanical assemblages. Nutshell, husk, and pit materials constitute the most endurable parts of edible plants, and are readily preserved archaeologically. Fleshy fruits, roots, and tubers, and starchy grains are usually less reliably intact in the archaeological record. In addition, processed foods such as dried fruits or vegetables, or potherbs or ground grains are often invisible in archaeobotanical assemblages. Although archaeobotanical recovery provides a small and biased sample of the array of plants originally deposited at a site, systematic sampling and analysis of these archaeological plant remains allow us to begin an interpretation of aboriginal subsistence patterns at Potomac Creek.

Based on the botanical data recovered, and our understanding of Late Woodland subsistence economies, we know that residents of the Potomac Creek Site used a wide spectrum of plants from the rich flora of the area for their food, fuel, construction, tools, and medicinal needs. The location of the Potomac Creek Site permitted ready access to the productive potential of a variety of micro-environmental zones, including forested uplands, wooded bottomlands, tidal freshwater marshes, fertile floodplain areas (well suited to agriculture), as well as Potomac Creek and the Potomac River proper. Site residents would have exploited the available plant resources of each of these ecological zones. Because the availability of various types of plant foods is strongly influenced by seasonal cycles, residents of 44ST2 would have maximized their dietary options by having direct access to this variety of vegetational zones throughout all seasons of the year, exploiting the productive potential of each in its turn. Surplus harvests, when available, would have been processed and stored for consumption during times of limited availability. Horticultural activities at the site would have further maximized the dietary options of site occupants.

The predominance of hickory and oak species documented throughout the site sample is entirely consistent with the forest cover type of the area (Brown et al. 1986; Brush 1986; Dent 1995), and with the basic pattern of wood remains expected for Late Woodland flotation assemblages in the region. The presence of various hickory and black walnut shells provides information on food plant utilization that supports our understanding of Late Woodland subsistence economies, where site occupants continued to rely, in part, on wild food resources, and where seasonally heavy mast merited intensive harvesting by local populations (Keene 1981).

The seed remains encountered within the botanical sample are representative of local wild plant species, lending no support in evidence for a reliance on native cultigens (i.e., the starchy trio chenopodium/polygonum/amaranth, or the oily seeded annuals sunflower or sumpweed) (Asch and Asch 1977; Scarry 1993). The scant archaeobotanical data from Middle and Late Woodland period sites in the Chesapeake Bay region have yielded some evidence for a reliance on these native cultigens (Coleman 1982; Custer 1989). Therefore, the recovery of cultivated native seeds would not be unexpected from late prehistoric contexts at the Potomac Creek Site.

The entire array of tropical or Meso-American cultigens feature prominently in Contact period ethnographic accounts of the Chesapeake Bay region (Barbour 1986:157–158; Quinn 1955:338–340), but archaeological evidence for horticultural economies based on their cultivation in scant (Dent 1995). Incrementally, archaeobotanical research is establishing a framework of data upon which to assess Late Woodland human-plant interactions. The Meso-American cultigens corn and beans are moderately well represented at 44ST2, and concur with the emerging pattern for related Late Woodland occupations (Dent 1995; Gardner 1990a, 1990b, 1994; MacCord et al. 1957; Potter 1993; Ritchie 1965; Slattery and Woodward 1992). However, squash and gourd remains are extremely limited to absent, with only a single cucurbit seed recovered from the site sample. Maize remains from the Potomac Creek Site included cupules, cupule fragments, kernels, kernel fragments, and some possible fragmented cob material (non-diagnostic). These remains are too fragmentary to permit the identification of the type of corn represented. Carbonized corn remains identified as 8-rowed flint have been identified from the Montgomery Focus Wilton and Shepard Sites (MacCord et al. 1957; Slattery and Woodward 1992). Nut to corn ratios at 44ST2 average 9:1 (based on specimen count). Nutshell remains are present in more features, and are more abundant in both weight and number than corn remains. While the abundance of nuts in relation to corn remains at 44ST2 is striking and unusual in Late Woodland contexts (Scarry 1993), it has been recently suggested that nuts and maize may have made relatively equal contributions to the diets of historic Algonquian peoples on Virginia's coastal plain (Gardner 1994). The nut to corn ratios at Potomac Creek may be a result of the limited botanical sample analyzed, or a product of preservational bias or sampling error.

Patterns of feature function can be explored via the distribution of plant remains from the 44ST2 archaeobotanical assemblage. Tropical cultigens are concentrated in, but not limited to, Features 1, 12, and 15. These cultigens are entirely absent from Feature 17. The floral assemblage from Features 1 and 15 (which are ditch features) fail to show any marked distinction in identified wood taxa that might represent a consistent building material for stockade walls. Although black locust (*Robinia pseudoacacia*) (a favored taxa for post and pole construction due to its extremely durable nature) is present within the Feature 1 sample, it occurs in quantities too low to allow further interpretation. Eastern red cedar (*Juniperus virginiana*) (another favored wood species for stockade construction) is present in the site sample but is absent from the 11 palisade-related features analyzed. Very sparse seed remains across all features sampled is consistent, with no concentrations of seeds or seed types evident.

The small archaeobotanical sample does little to advance an understanding of seasonal resource utilization at the Potomac Creek Site. The sample yields no evidence for consumption of fleshy fruits, berries, or native wild or cultivated seeds. It is likely that this lack of evidence for the utilization of such foods is a result of the limited sample size rather than a reflection of the true spectrum of food plants employed in the diet of site occupants. Based on the archaeobotanical data at hand, it is know that hickory and walnut meats contributed to the diet. While these resources ripen for harvest during the fall months, Barbour (1986:162) notes that stored nutmeats were heavily relied upon during the spring months of March through June. These current data also reveal the prominent role of Meso-American cultigens in the diet. Harvests of corn and beans store well, and likely provided a reserve of food for months when other plant foods were scarce (Potter 1993:40–42).

CONCLUSION

We can only begin to understand the role of horticulture in the subsistence economy and development of the Potomac Creek culture based on this archaeobotanical assemblage. Although uniquely early historic accounts provide a valuable reference for the study of Contact period plant utilization in Virginia, and although year by year the archaeobotanical database for the Middle Atlantic region grows, still frustratingly little is know about the extent to which agriculture contributed to the foodways and lifeways of the late prehistoric peoples of the Chesapeake Bay (Dent 1995:254; Potter 1993).

As only 56 liters of cultural fill has been analyzed for macrofloral remains at 44ST2, it is unrealistic to expect the total range of subsistence behaviors to be reflected in this limited sample. Nevertheless, the contribution of these archaeobotanical data to the research goals at 44ST2 is considerable. For the first time, identifiable foodstuffs have been recovered from archaeological contexts at the site, and have established a subsistence pattern where practiced horticulture (focused on tropical cultigens) is supplemented by the gathering of nut mast and other wild plant foods, facilitating possible year-round habitation at the site. Identification of wood fragments from feature contexts is germane to site environment, and the data concur with established pre-Contact period forest cover for the region. Although the wood data do not reveal either a pattern of taxa selection for the construction of particular structures (i.e., stockade walls) or the unequivocal selection of certain wood taxa for specific functions (i.e., fuelwood), they are nonetheless valuable in establishing a pattern for forest utilization at the site. Regarding the research goal of advancing an understanding of site function, the archaeobotanical data make less of a contribution. Unfortunately, scrutiny of the macrofloral assemblage from 44ST2 lends little insight to feature function or spacial patterning at the site. The data do evidence a sophisticated economic and social framework focused on plant husbandry. This evidence supports potential year-round habitation at the site.

Although the limited size of the archaeobotanical sample analyzed from 44ST2 prohibits a rigorous interpretation of Late Woodland subsistence, the data are instructive. They encourage further exploration of the dynamic relationship between culture and the vegetative landscape at the Potomac Creek Site.

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APPENDIX C

FAUNAL ANALYSIS OF THE POTOMAC CREEK SITE (44ST2)

Prepared by:
Gwenyth Duncan

The first systematic recovery of faunal remains from the Potomac Creek Site (44ST2) was undertaken by the William and Mary Center for Archaeological Research (WMCAR) in 1996–1997. The Potomac Creek Site, a palisaded village site, is situated at the confluence of the Potomac River and Potomac Creek just east of the fall line in the coastal plain of Virginia. This site dates to the Late Woodland period, with features analyzed for this report having been radiocarbon dated as early as the fourteenth century and as late as the mid-sixteenth century.

Although extensive excavations have been carried out at the site, particularly in the 1940s, archaeological materials recovered were obtained without benefit of screening. The Potomac Creek Site exhibits many of the characteristics of a Late Woodland period chiefdom and is the "type site" for Potomac Creek pottery. If the material culture recovered at the Potomac Creek Site is characteristic of a Late Woodland period chiefdom, then it stands to reason that the faunal remains should reflect the subsistence strategies taking place during that time as influenced by the political organization in control of the site as well as the surrounding areas.

A total of 9,872 bone fragments was obtained from 1/4 inch screening during the WMCAR's excavations. From this, a sample of 4,587 fragments was analyzed for this report. Faunal remains were also obtained through flotation, and light and medium fractions were examined, but not quantified, from Features 1 and 12A. The majority of the fragments from flotation were fish scales, and no new species were identified from the flotation samples. The faunal materials from each feature have been kept as discreet assemblages. These analyzed features include:

Feature 1: a ditch associated with a palisade line dating to the mid-fourteenth century or later
Feature 12A: a large pit dating to the mid-sixteenth century
Feature 15: expansion of the ditch of Feature 1 dating no earlier than the mid-fourteenth century
Feature 17: a large pit with the earliest radiocarbon date of the fourteenth century
Feature 24: a small pit
Feature 25: a large pit
Feature 26: oval basin

Tables C-1 through C-35 include data for faunal remains by taxa, element distributions, summaries by class, modifications, and measurements.

METHODOLOGY

All vertebrate faunal materials were processed and identified using standard zooarchaeological methods and procedures. Faunal identifications were made by the author using comparative zoological materials at the Colonial Williamsburg Foundation's Department of Archaeological Research and the WMCAR. After all possible identifications were made, the bones were counted, weighed, and examined for evidence of butchering and/or other alterations (such as burning, carnivore chewing, etc.). All elements were paired to determine the minimum number of individuals (MNI). Measurements were taken of elements that were fully fused using the guidelines established by von den Dreisch (1976). After analysis was completed, all faunal materials were returned to WMCAR.

Zooarchaeological research involves certain methodological procedures that have become standard practice but are not always practical or statistically meaningful. One procedure in particular is the use of minimum numbers of individuals (MNI) to indicate reliance, or emphasis, on whole animals. This analytical procedure is pertinent to faunal materials recovered from sites where hunting activities played a large role in subsistence and where animal carcasses would have been brought.

Whereas MNI statistics emphasize individual animals, biomass calculations emphasize the quantity of meat supplied by an animal. Calculations are based on an allometric principle that proportions of body mass, skeletal mass, and skeletal dimensions change with increasing body size (Reitz et al. 1987), using the premise that X kilograms of archaeological bone weight represent a certain quantity of live meat weight (Y). Biomass infers the probability that only certain portions of animals were used at sites where preserved meats or redistributed meats were consumed.

Both MNI and biomass calculations are so subject to sample bias that Casteel (1978), Grayson (1979), and Wing and Brown (1979) have suggested a sample size of at least 1,400 identifiable bones or 200 individuals (MNI) in order for a sample to be statistically meaningful. However, Wing and Brown (1979) acknowledge that this recommended sample size is based on assemblages from the Caribbean, where species diversity is a large factor. “For those sites with faunal assemblages that have a low species diversity, such as most sites located in northern latitudes or at high altitudes or those with specialized diets, this criterion of adequacy would not be valid” (Wing and Brown 1979:119).

RESULTS

Feature 1. Of the 4,587 bone fragments analyzed from the site, 3,035 fragments (or 66%) were recovered from Feature 1. Twenty-four taxa identified to the family, genus, and species levels represent the fish, reptile, bird, and mammal classes. Only the class of amphibian is not represented. The majority of fragments (number of individual specimens [NISP]) were identified as unidentified mammal (n=940). The overwhelming majority of these fragments are from medium to large mammals and probably represent deer bone, but lack distinguishing characteristics to identify them specifically as such. The next largest category of bone fragments was identified as deer (*Odocoileus virginianus*), with NISP=737, or 24% of the assemblage. After unidentified bone (NISP=405), other categories drop severely; the third highest number of fragments is attributed to unidentified bird (NISP=162). Box turtle (*Terrapene carolina*) is next with NISP=145, then gar (*Lepisosteus* spp.) with NISP=130, and unidentified turtle fragments with NISP=116. Other categories fall below 100 fragments, while the various small mammal categories have 10 or less fragments.

In terms of biomass, deer make up 73.4% of the overall total, while all other taxa fall well below. The next highest percentage is unidentified mammal (14.4%), and after these taxa no others contribute more than 2% of the total biomass. Box turtle and turkey (*Meleagris gallopavo*) contribute 1.9% and 2% , respectively, sturgeon (*Acipenser* spp.) contributes 1.6%, and unidentified bird is 1.1%. Bobcat (*Felis rufus*) is 1.0% of the total biomass, and all other taxa fall below 1.0%.

There is a total of 47 MNI for this assemblage. Deer have the highest number of individuals (MNI=8) while catfish (MNI=5) and turkey (MNI=5) have the second greatest number of individuals. Box turtle have 4 MNI, gar, sucker, bass, slider/cooter (*Chrysemys* spp.), and raccoon each have 2 MNI, while all other taxa for which MNI was calculated have 1 MNI each.

Regarding deer, the element distribution table indicates a relatively even distribution of the various elements, suggesting that whole carcasses were being brought to and butchered at the site. The predominant meat-bearing elements present in this assemblage are vertebra, innominate (the pelvic region), radius, and tibia. The number of antler fragments has skewed the sample, and two factors need to be considered with regard to antler. The first is that antlers do not contribute directly to meat subsistence and are listed here in terms of presence/absence. Secondly, antlers are an indication of sex and seasonality only if they are still attached to the cranium. The majority of antler fragments from this assemblage, as well as from all other assemblages, are not attached to crania. Since antlers are shed, there is a high probability that shed antler would have been picked up for tool-making and brought back to the site.

Feature 12A. This assemblage consists of 623 fragments comprising 14 taxa identified to the family, genus, and species levels representing fish, turtle, bird, and mammal classes. No amphibians were identified in this assemblage. The majority of fragments, excluding the unidentified bone category, are unidentified fish (NISP=107), representing 17.1% of the assemblage. Unidentified mammal comprise 14.4% and deer are 10.9% of the total number of fragments identified. Unidentified bird represents 7.7% of the total and gar 6.1%. Freshwater catfish (Ictaluridae) makes up 4.8%, while turkey represents 4.1% of the NISP. Overall, turtles are second to last in terms of frequency, while small mammals comprise the smallest number of fragments identified.

With regard to biomass, deer contributes the highest percentage with 69%. Other species identified contribute much less, with turkey at 4.3% of the overall biomass, snapping turtle (*Chelydra serpentina*) and box turtle at 2.6% and 2.7%, respectively, Ictaluridae at 1.7%, and gar at 1.4%. All other species identified are each less than 1% of the total biomass.

There are 25 individuals represented in this assemblage. Freshwater catfish is the predominant taxon with 6 MNI. Deer have 3 MNI, white perch (*Morone americana*) and turkey have 2 MNI each, and all the other taxa for which MNI was calculated each represent a single individual.

There are fewer meat-bearing elements for deer in this assemblage than in the Feature 1 assemblage. Rib is the most frequent element (23.5%), and although vertebra is the second most frequent (11.8%) element, some of the truly meaty parts such as innominate, femur, and tibia are not even represented.

Feature 15. A total of 547 fragments were examined from this feature. Nine taxa have been identified to the family, genus, and species levels. Among these taxa, the greatest percentage of fragments is deer (NISP=99 or 18.1%), while other taxa decline sharply. Gar represents 2.7% of the overall NISP, turkey 2.6%, slider/cooter turtles 2.4%, and box turtle 2.2%. All other identified taxa constitute less than 1% of the NISP.

Deer comprise nearly 76% of the total biomass. Of other species identified, turkey and box turtle are second most frequent with 2.1% each, while Emydidae is a close third with 2%. No other family, genus, or species identified represents more than 0.6% of the overall biomass.

A total of 13 individuals represent this assemblage. Deer has the highest number with 3 MNI. White perch and turkey both have 2 MNI. All other taxa for which MNI was calculated have 1 MNI each. These are listed according to their NISP relative frequencies (highest to lowest) and are gar, slider/cooter, box turtle, snapping turtle, freshwater catfish, and muskrat.

In terms of deer element distributions, meat-bearing elements from the forelimbs (humerus and scapula) are well represented. Rib and vertebra are just as evenly represented (10.1% and 7.1%, respectively), while femur and tibia are only half as frequent (5.1% and 4%, respectively).

Feature 17. This assemblage consists of 216 fragments. Over 50% of the fragments in this assemblage could be attributed to class only. The largest number of fragments identified to the species level belongs to deer (13.4%) and box turtle (NISP=12.5%). All other species identified constitute less than 1% each.

In terms of biomass, deer make up 52% of the total, while box turtle represents 8.7%. Of the other identified species, snapping turtle comprises 1.6%, and all others are less than 1%.

A total of 7 MNI represent this assemblage. Listed according to their relative NISP frequencies (highest to lowest) they are: deer, box turtle, unidentified bird, gar, muskrat, freshwater catfish, and snapping turtle.

Regarding element distributions for deer, meat-bearing elements are well-represented in this assemblage. Innominate (13.8%), scapula (10.3%), and femur (10.3%) have the highest percentages, while rib (6.9%), humerus (3.4%), and radius (3.4%) are also present but in lower frequencies.

Feature 24. Only 27 fragments comprise this assemblage, and alone it is not a statistically viable sample. Furthermore, 85% of the material could not be assigned beyond the unidentified mammal (NISP=11) or unidentified bone (NISP=12) categories.

One gar, one turtle, and one deer comprise the 3 MNI for this assemblage. The element distributions for deer indicate a single tooth and one phalanx from this feature.

Feature 25. A total of 115 fragments were examined from this feature; of these, seven taxa were identified beyond class. The most frequently represented taxa are gar (NISP=12) comprising 10.4% of the sample, deer with 8.7% (NISP=10), and box turtle with 6.0% (NISP=7).

Regarding biomass, deer has the highest percentage with 48.5%. Turkey and box turtle are second and third, respectively, with 6.3% and 5.6%. Gar makes up 2.5% of the overall biomass. All other species identified are less than 1% of biomass from the feature.

There are 7 MNI in this assemblage. Listed relative to their frequencies of occurrence for NISP, they are gar, deer, box turtle, and turkey. The other individuals have equivalent NISP and are listed taxonomically. These are mud/musk turtle, opossum, and muskrat.

The element distributions for deer indicate a good representation of the meat-bearing elements. These include scapula (20%), tibia (20%), innominate (10%) and vertebra (10%).

Feature 26. This assemblage includes a total of 24 bone fragments and is not considered to be an adequate statistical sample. Turtle is not represented in this assemblage, whereas it tends to be prevalent in the other assemblages. In keeping with the other assemblages, however, deer comprises the highest number of fragments (NISP=6 or 25%). Bobcat (Felis rufus) was found in this feature as well as in Feature 1.

Deer has the highest percentage of biomass (70.8%) and bobcat is second with 10.5%. Biomass for other species identified includes turkey (5.3%), gar (1.8%), and muskrat (1.8%).

Element distributions for deer show that only rib (33.3%) and tibia (16.7%) are represented.

Summarizing the data by class (fish, turtle, bird, and mammal) for each of the assemblages facilitates discussion. The most notable trend among all the assemblages is the absence of amphibians and commensal taxa. Commensal taxa consist of species of animals that are attracted to areas of human activity but not usually part of a diet regimen. The lack of amphibians, particularly frogs, is interesting since frog legs could have been part of subsistence in the coastal plain. Neither were amphibian or commensal taxa remains found in the light and medium fractions examined. If frogs were eaten, then perhaps the manner of cooking resulted in little or no preservation. However, ethnographic evidence from John Smith's explorations in the early seventeenth century, presented below, makes no reference to amphibians as part of the diet.

Feature 1 has been dated, at the earliest, to the mid-fourteenth century. This feature also contained the largest sample of faunal remains analyzed for the Potomac Creek Site. Feature 15 dates to approximately the same time period, and, although the assemblage is much smaller, the relative frequencies of animals by class are similar. Mammal is the most prevalent and bird the least frequent. Fish and turtle vie for second place depending on the quantification method used.

Feature 12A has been radiocarbon dated to the mid-sixteenth century, which is the latest assemblage analyzed for this report. A striking difference between Feature 12A and the other assemblages is the relative high frequency of fish (NISP=43.1%). In Feature 12A, fish exceeds mammal in frequency for both NISP and MNI (43.1% and 44%, respectively). Only in biomass does mammal (80%) supersede fish (5.6%). In Feature 12A, turtle and bird frequencies are almost even, which is in contrast to the majority of the other assemblages where turtle almost always exceeds bird.

The other assemblages analyzed for this report resemble Features 1 and 15, although these other assemblages are not as large. The prevailing characteristics of the assemblages, combined with the observations made by early

English explorers, suggest that the Potomac Creek Site supported a regional chiefdom where meat was received as tribute, in the form of deer, turtle, fish, and bird. Only Feature 12A appears to be an exception to this pattern.

DISCUSSION

Ethnographic evidence for meat subsistence strategies of Native Americans is presented in *The Complete Works of Captain John Smith* (Smith 1986). Smith took extensive notes on the native peoples inhabiting the Chesapeake region during his 1608 explorations. His observations about animals that were important in the Native-American diet are often evident in the archaeological record. At the same time, however, Smith refers to an abundance of certain taxa—particularly fish and waterfowl—that is not revealed in the archaeological record. A synopsis of Smith's ethnohistorical accounts is presented below as a framework for the archaeological record.

As previously stated, the English explorers were overwhelmed by the abundance of waterfowl and took advantage of their seasonal migrations as early as the month of September:

> ... about the tenth of September there was about 46 of our men dead ... Our provision being now within twentie dayes spent, the Indians brought us great store both of Corne and bread ready made: and also there came such aboundance of Fowles into the Rivers , as greatly refreshed our weake estates ... (Smith 1986:35).

Another reference to waterfowl is as follows:

> Many birds and fowles they see us dayly kil that much feared them (Smith 1986:41).

The primary importance of deer in the diet is evident both archaeologically and in ethnohistorical accounts. The fact that venison plays a large role in gift-giving is evident in the following passage:

> The Emperour Powhatan each weeke once or twice sent me many presents of Deare, bread, Raugroughcuns [raccoons] ... (Smith 1986:61).

The value placed on food in a subsistence economy cannot be stressed enough, and this is evident in the following statements:

> The King, rising from his seat, conducted me foorth, and caused each of my men to have as much more bread as hee could beare, giving me some in a basket, and as much he sent a board for a present to my Father [Captain Christopher Newport]: victuals you must know is all there wealth, and the greatest kindnes they could shew us ... (Smith 1986:67).

The quantity of food was also a display of wealth:

> Presently after he sent me a quarter of Venizon to stay my stomacke ... (Smith 1986:67).

> ... he earnestly desired us [30 to 40 men in the party] to stay for dinner which was a providing, ... bread and venizon, sufficient for fiftie or sixtie persons (Smith 1986:71).

The ability of the ruling leader to obtain foodstuffs not readily available in his own household is illustrated in the following:

> The next day till noone wee traded: the King feasted all the company, and the afternoone was spent in playing, dauncing, and delight: by no meanes hee would have us depart till the next day, he had feasted us with venizon, for which he had sent, having spent his first and second provision in expecting our comming ... (Smith 1986:77).

The importance of deer in particular as a value commodity is evident in the following:

> Powhatan ... sent his daughter, a child of tenne yeares old ... which he most esteemed, to see me, a Deere and bread besides for a present ... (Smith 1986:93).

Smith's observations concerning the relative importance of animals in the diet include the following:

> Of beastes the chiefe are Deare ... In the deserts towards the heads of the rivers, ther are many, but amongst the rivers few. There is a beast they call Aroughcun [raccoon], much like a badger, but useth to live on trees as Squirrels doe. Their Squirrels some are neare as greate as our smallest sort of wilde rabbits ... the most are gray. An Opassom hath a head like a Swine, and a taile like a Rat ... Mussascus [muskrat], is a beast of the forme and nature of our water Rats, but many of them smell exceeding strongly of muske. Their Hares no bigger then our Conies, and few of them to be found.
>
> Their beares are very little in comparison of those of Moscovia and Tartaria. The Beaver is as bigge as an ordinary water dogge....His taile somewhat like the forme of a Racket bare without haire, which to eate the Savages esteeme a great delicate. They have many Otters which as the Beavers they take with snares, and esteeme the skinnes great ornaments, and of all those beasts they use to feede when they catch them (Smith 1986:154-155).

With regard to waterfowl:

> In winter there are great plenty of Swans, Craynes, gray and white with black wings, Herons, Geese, Brants, Ducke, Wigeon ... Of all those sorts great abundance ... But in sommer not any or a very few to be seen (Smith 1986:155-156).

Not all faunal remains are by-products of dietary regimens. Processing deer antler is one example and is described by John Smith:

> With the sinews of Deare, and the tops of Deares hornes boiled to a jelly, they make a glew that will not dissolve in cold water (Smith 1986:163).

The methods used to hunt deer were either communal hunts, which may have included as few as two hunters or as many as 300, and also stalking by a single hunter (Smith 1986:164-165). Communal hunts are described by Smith:

> Having found the Deare, they environ them with many fires, and betwixt the fires they place themselves. And some take their stands in the midst. The Deare being thus feared by the fires and their voices, they chace them so long within that circle that many times they kill 6, 8, 10, or 15 at a hunting. They use also to drive them into some narrowe point of land; when they find that advantage and so force them into the river, where with their boats they have Ambuscadoes to kill them.

The importance of deer and turkey as tribute to their chief (referred to as "werowance" in Algonquian) is evident in the following statement:

> They all knowe their severall landes, and habitations, and limits, to fish, fowle, or hunt in, but they hold all of their great Werowance Powhatan, unto whome they pay tribute of skinnes, beades, copper, pearle, deare, turkies, wild beasts, and corne. What he commandeth they dare not disobey in the least thing.

Since the Potomac Creek Site is believed to have been a chiefdom center, where tribute was in the form of deer, we would expect to find an abundance of large, meat-bearing elements from mature, but not old, deer. The faunal evidence shows that the majority of deer at the Potomac Creek Site were fully fused adults. This suggests that only large deer were being selected either during the hunt or when paying tribute to the chief. A trend toward meaty elements, such as the scapula-humerus area and the innominate-femur area, was also noticed in the archaeological data.

The tooth eruption and wear patterns also indicate that adult deer were being selected. Although the majority of mandibles were from adults, most of these contained teeth that were not heavily worn. This suggests that very old, and hence tough, individuals were not being given to the chiefdom leaders.

The relative lack of waterfowl in the archaeological record could be attributed to recovery techniques. However, as previously stated, both 6.4-mm mesh and flotation samples from across the site did not reveal the abundance that could be expected from the ethnohistorical accounts. The birds may have been difficult to obtain using Native-American hunting techniques. Also, since migratory species of waterfowl are indicative of spring and fall, and hunting camps tended to be dispersed during these seasons (Smith 1986; Potter 1993), waterfowl as tribute may not have been feasible.

These same arguments could be used for the unexpectedly low frequencies of fish remains. Historical accounts (Smith 1986; Wharton 1957) elaborate on the fecundity of fish in the Chesapeake region and its rivers. However, the archaeological record at the Potomac Creek Site does not reflect an abundance of fish. Fish may not have been used as a frequent tribute item. Alternatively, when used as a tribute item, fish may have been processed and preserved elsewhere, then brought to the Potomac Creek Site. A relatively low frequency of fish remains could also be attributed to the manner in which fish are cooked and/or preserved since such practices can result in poor preservation. Cooking fish in stews, a common practice according to ethnohistorical accounts, would have caused the skeletal mass to soften and become almost digestible. In contrast, bony plates such as those found on sturgeon and gar, and which would have been removed prior to cooking, preserve well due to their dense nature and, as a result, tend to occur more frequently in the archaeological record.

In conclusion, the Potomac Creek Site is a chiefdom site where tribute may have been received in the form of large, adult deer in great quantities relative to other animals found at the site. Waterfowl, though abundant by European standards, was not abundant in the archaeological record. Waterfowl was easily taken with firearms and sustained the early English explorers in times of hunger, and therefore, receives more attention in ethnohistorical accounts than suggested by the archaeological record from this chiefdom site. Although seasonal hunting camps may have been harvesting waterfowl, this type of animal may not have been used as tribute. Fish was probably used frequently as a tribute payment, but the processing techniques used were not conducive to preservation.

Lastly, Moore (1994) has argued that faunal analyses can be used to determine levels of political organization within regions, based on site-by-site analyses within a region. Although a chiefdom level of political organization was already determined for the Potomac Creek Site based on archaeological and historical evidence, the faunal remains analyzed for this report have added to a base of knowledge that others may draw from when studying chiefdom societies in the Chesapeake region. To reinforce Moore's argument that food acquisition and distribution is a major factor in political organizations within a subsistence economy, Captain John Smith states it best:

> ... their victuall is their chiefest riches (Smith 1986:168).

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Element	Number	Percent
Skull	36	4.9
Antler	158	21.4
Mandible	38	5.2
Tooth	22	3.0
Vertebra	60	8.1
Rib	37	5.0
Innominate	40	5.4
Scapula	33	4.5
Humerus	27	3.7
Ulna	19	2.6
Radius	38	5.2
Carpal	14	1.9
Metacarpal	18	2.4
Femur	29	3.9
Tibia	38	5.2
Tarsal	21	2.8
Metatarsal	32	4.3
Metapodial	30	4.1
Phalanx	43	5.8
Sesamoid	4	0.5
Total	**737**	**100.0**

Table C-1. Feature 1, deer element distributions.

Element	Number	Percent
Skull	11	16.2
Antler	1	1.5
Mandible	16	23.5
Tooth	1	1.5
Vertebra	8	11.8
Rib	16	23.5
Innominate	0	0.0
Scapula	3	4.4
Humerus	1	1.5
Ulna	0	0.0
Radius	2	2.9
Carpal	1	1.5
Metacarpal	4	5.9
Femur	0	0.0
Tibia	0	0.0
Tarsal	1	1.5
Metatarsal	2	2.9
Metapodial	1	1.5
Phalanx	0	0.0
Sesamoid	0	0.0
Total	**68**	**100.0**

Table C-2. Feature 12, deer element distributions.

Element	Number	Percent
Skull	9	9.1
Antler	0	0.0
Mandible	10	10.1
Tooth	16	16.2
Vertebra	7	7.1
Rib	10	10.1
Innominate	0	0.0
Scapula	7	7.1
Humerus	10	10.1
Ulna	1	1.0
Radius	3	3.0
Carpal	1	1.0
Metacarpal	1	1.0
Femur	5	5.1
Tibia	4	4.0
Tarsal	3	3.0
Metatarsal	3	3.0
Metapodial	3	3.0
Phalanx	4	4.0
Sesamoid	2	2.0
Total	**99**	**100.0**

Table C-3. Feature 15, deer element distributions.

Element	Number	Percent
Skull	1	3.4
Antler	3	10.3
Mandible	3	10.3
Tooth	0	0.0
Vertebra	0	0.0
Rib	2	6.9
Innominate	4	13.8
Scapula	3	10.3
Humerus	1	3.4
Ulna	0	0.0
Radius	1	3.4
Carpal	4	13.8
Metacarpal	0	0.0
Femur	3	10.3
Tibia	1	3.4
Tarsal	0	0.0
Metatarsal	0	0.0
Metapodial	0	0.0
Phalanx	3	10.3
Sesamoid	0	0.0
Total	**29**	**100.0**

Table C-4. Feature 17, deer element distributions.

Element	Number	Percent
Skull	0	0.0
Antler	0	0.0
Mandible	0	0.0
Tooth	1	50.0
Vertebra	0	0.0
Rib	0	0.0
Innominate	0	0.0
Scapula	0	0.0
Humerus	0	0.0
Ulna	0	0.0
Radius	0	0.0
Carpal	0	0.0
Metacarpal	0	0.0
Femur	0	0.0
Tibia	0	0.0
Tarsal	0	0.0
Metatarsal	0	0.0
Metapodial	0	0.0
Phalanx	1	50.0
Sesamoid	0	0.0
Total	**2**	**100.0**

Table C-5. Feature 24, deer element distributions.

Element	Number	Percent
Skull	1	10.0
Antler	0	0.0
Mandible	1	10.0
Tooth	1	10.0
Vertebra	1	10.0
Rib	0	0.0
Innominate	1	10.0
Scapula	2	20.0
Humerus	0	0.0
Ulna	0	0.0
Radius	0	0.0
Carpal	0	0.0
Metacarpal	0	0.0
Femur	0	0.0
Tibia	2	20.0
Tarsal	0	0.0
Metatarsal	0	0.0
Metapodial	1	10.0
Phalanx	0	0.0
Sesamoid	0	0.0
Total	**10**	**100.0**

Table C-6. Feature 25, deer element distributions.

Element	Number	Percent
Skull	0	0.0
Antler	1	16.7
Mandible	0	0.0
Tooth	0	0.0
Vertebra	0	0.0
Rib	2	33.3
Innominate	0	0.0
Scapula	0	0.0
Humerus	0	0.0
Ulna	0	0.0
Radius	0	0.0
Carpal	0	0.0
Metacarpal	0	0.0
Femur	0	0.0
Tibia	1	16.7
Tarsal	0	0.0
Metatarsal	0	0.0
Metapodial	0	0.0
Phalanx	1	16.7
Sesamoid	1	16.7
Total	**6**	**100.0**

Table C-7. Feature 26, deer element distributions.

Element	mm	mm	mm	mm
Atlas	BFcr=55.25			
	BFcr=62.25	H=48.35		
Axis	BFcr=47.35			
	BPcr=54.60			
	BPcr=56.25			
Scapula	GLP=39.05	LG=30.35	BG=28.70	SLC=23.45
	GLP=41.85	LG=33.20	BG=30.70	SLC=22.55
	GLP=43.70	LG=34.40	BG=32.50	SLC=27.25
	GLP=43.85	LG=35.65		SLC=25.30
	GLP=45.30	LG=35.60	BG=34.75	SLC=25.00
	GLP=47.90	LG=38.45	BG=37.70	SLC=28.75
		LG=30.95	BG=26.25	SLC=22.40
				SLC=19.65
				SLC=20.30
				SLC=22.45
Humerus		BT=35.40	Bd=41.20	
		BT=35.50		
		BT=37.25	Bd=40.30	
		BT=40.09		
		BT=40.80	Bd=43.65	
		BT=42.10	Bd=47.10	
			Bd=38.60	
			Bd=42.65	

Bd = Greatest breadth of the distal end
Bg = Breadth of the glenoid cavity
Bp = Greatest breadth of the proximal end
BFcd = Breadth of the Facies articularis caudalis
BFcr = Breadth of the Facies articularis cranialis
BPC = Greatest breadth across the coronoid process
BT = Greatest breadth of the trochlea
DLS = Greatest diagonal length of the sole
GB = Greatest breadth
GLP = Greatest length of the Processus articularis (glenoid process)
GLpe = Greatest length of the peripheral half
GL = Greatest length
GLl = Greatest length of the lateral half
GLm = Greatest length of the medial half
LA = Length of the acetabulum including the lip
LAR = Length of the acetabulum on the rim
Ld = Length of the dorsal surface
MBS = Middle breadth of the sole
SD = Smallest breadth of the diaphysis
SDO = Smallest depth of the olecranon
SLC = Smallest length of the neck of the scapula

Table C-8. Feature 1, measurements for fused deer elements (continues next page).

Element	mm	mm	mm	mm
Radius	BFp=34.15	Bp=37.55		
	BFp=34.15	Bp=36.50		SD=22.25
	BFp=37.20	Bp=39.45		SD=22.70
	BFp=37.90	Bp=39.95		
	BFp=38.45			
	BFp=38.60	Bp=41.70		
	BFp=39.15	Bp=43.45		
			Bd=32.90	BFd=31.45
			Bd=33.15	
Ulna	SDO=28.85	BPC=29.00		
	SDO=31.80		LO=54.60	
		BPC=22.55		
		BPC=22.55		
Metacarpal		Bp=31.50		
		Bp=32.10		
		Bp=32.15		
		Bp=33.15		
			Bd=31.10	
			Bd=32.70	
Sacrum	BFcr=40.60			
Innominate	LA=36.90			
	LA=38.15			
	LA=42.35			
		LAR=40.20		
Femur	DC=28.75			
Tibia		Bp=54.75		
			Bd=32.90	
	SD=21.00		Bd=34.70	
			Bd=38.50	
			Bd=38.20	
			Bd=39.55	
Metatarsal			Bd=34.65	
		Bp=28.40		
			Bd=35.80	
Patella		GB=33.15		
Calcaneus	GL=89.50	GB=27.90		
	GL=98.25	GB=33.30		
Astragalus	GLm=37.80	GLl=40.95	Bd=24.75	
	GLm=38.15	GLl=40.25	Bd=24.90	
	GLm=38.40	GLl=41.95	Bd=26.95	
	GLm=39.15	GLl=42.90	Bd=27.3	

Table C-8 (continued). Feature 1, measurements for fused deer elements (continues next page).

Element	mm	mm	mm	mm
Cubo-navicular		GB=31.25		
		GB=33.20		
		GB=34.55		
Phalanx I	GLpe=45.50	Bp=17.00	Bd=14.60	SD=12.30
	GLpe=45.70	Bp=15.90	Bd=12.90	SD=11.60
	GLpe=48.70	Bp=15.00	Bd=14.00	SD=12.60
	GLpe=50.00	Bp=18.55	Bd=14.75	SD=13.25
		Bp=16.05		
		Bp=17.00		
			Bd=13.45	
			Bd=14.30	SD=11.75
Phalanx II	GL-29.85	Bp=12.30	Bd=9.15	SD=9.35
	GL=29.85	Bp=12.35	Bd=9.65	SD=9.20
	GL=31.95	Bp=12.85	Bd=9.05	SD=9.65
	GL=34.80	Bp=14.90	Bd=12.00	SD=10.80
	GL=35.00	Bp=12.60	Bd=8.90	SD=9.35
	GL=35.45		Bd=10.05	SD=9.70
	GL=35.85	Bp=14.20	Bd=11.00	SD=10.60
	GL=37.45	Bp=14.85	Bd=11.25	SD=11.65
	GL=39.35	Bp=15.80	Bd=11.90	SD=12.10
Phalanx III	DLS=29.75	MBS=7.25		
	DLS=30.85	MBS=7.55	Ld=28.00	
	DLS=32.50	MBS=8.65	Ld=29.70	
	DLS=32.80		Ld=30.15	
	DLS=33.00	MBS=8.75	Ld=30.45	
	DLS=33.75	MBS=8.45	Ld=30.00	
	DLS=34.45	MBS=7.85		
	DLS=35.60	MBS=9.50	Ld=32.55	
	DLS=35.65	MBS=9.90	Ld=30.95	

Table C-8 (continued). Feature 1, measurements for fused deer elements.

Element	mm	mm	mm
Humerus		Bd=39.35	
Radius		Bd=32.00	
Metatarsal	Bp=28.95		
Astragalus	GLm=36.35	GLl=39.6	Bd=24.40

Table C-9. Feature 12, measurements for fused deer elements.

Element	mm	mm	mm	mm
Atlas	BFcr=55.15			
Axis	BFcr=54.00			
Scapula	SLC=27.45	BG=35.20	LG=35.75	GLP=47.20
Humerus	BT=38.65	Bd=42.95		
Radius	BFp=35.40	Bp=36.45		
	Bd=38.90			
Calcaneus	GL=83.05			
	GL=96.20	GB=29.50		
Astragalus	GLm=35.70	GLl=37.50		
Phalanx II	Bp=12.00	Bd=8.45	SD=9.15	
	GL=37.30	Bp=14.45	Bd=11.50	SD=10.45
Phalanx III	DLS=33.25	MBS=9.10	Ld=30.45	
	DLS=33.60	MBS=9.60	Ld=30.90	

Table C-10. Feature 15, measurements for fused deer elements.

Taxon	**Cut**	**Hacked**	**Burned**	**Carnivore Chewed**	**Rodent Chewed**	**Worked**
Unid. Turtle			2			
Kinosternidae			1			
Chrysemys			1			
Terrapene carolina	2		2			3
Unid. Bird				1		7
Meleagris gallopavo	1	6				1
Unid. Mammal	2	200	108			25
Didelphis virginiana		1				
Canis		2				
Ursus americanus		1				
Procyon lotor		2				
Felis rufus	3	1				
Odocoileus virginianus	15	188	12	4		16
Unid. Bone			5			1
Total	**23**	**401**	**131**	**5**		**53**

Table C-11. Feature 1, modifications by taxon.

Taxon	Cut	Hacked	Burned	Carnivore Chewed	Rodent Chewed	Worked
Chrysemys	1					
Unidentified Bird						1
Meleagris gallopavo		1				1
Unidentified mammal		68	13			3
Ondatra zibethicus	1					
Odocoileus virginianus	5	19		3		1
Unidentified bone			4			
Total	**7**	**88**	**17**	**3**		**6**

Table C-12. Feature 12, modifications by taxon.

Taxon	Cut	Hacked	Burned	Carnivore Chewed	Rodent Chewed	Worked
Unid. Turtle			2			
Meleagris gallopavo	2	1				
Unid. Mammal			10			5
Odocoileus virginianus	2	27	1			4
Unid. Bone			3			
Total	**4**	**28**	**16**			**9**

Table C-13. Feature 15, modifications by taxon.

Taxon	Cut	Hacked	Burned	Carnivore Chewed	Rodent Chewed	Worked
Chelydra serpentina		1				
Terrapene carolina	2					
Unid. Mammal			1		1	
Odocoileus virginianus		10		6		
Total	**2**	**11**	**1**	**6**	**1**	

Table C-14. Feature 17, modifications by taxon.

Taxon	Cut	Hacked	Burned	Carnivore Chewed	Rodent Chewed	Worked
Unid. Mammal			1			
Total			**1**			

Table C-15. Feature 24, modifications by taxon.

Taxon	Cut	Hacked	Burned	Carnivore Chewed	Rodent Chewed	Worked
Unid. Turtle			1			
Unid. Bird			2			
Unid. Mammal			9			2
Ondatra zibethicus		1				
Odocoileus virginianus		2	2		1	1
Unid. Bone			1			
Total		**3**	**15**		**1**	**3**

Table C-16. Feature 25, modifications by taxon.

Taxon	Cut	Hacked	Burned	Carnivore Chewed	Rodent Chewed	Worked
Unid. Bird		1				
Unid. Mammal			1			
Felis rufus	1					
Odocoileus virginianus						1
Unid. Bone			1			
Total	**1**	**1**	**2**			**1**

Table C-17. Feature 26, modifications by taxon.

Taxon	NISP		MNI		Weight		
	N	%	N	%	grams		%
Unidentified Fish	76			2.5	9.8	0.187	0.2
Acipenser spp. (sturgeon)	41	1.4	1	2.1	100.5	1.179	1.6
Lepisosteus spp. (gar)	130	4.3	2	4.3	27.0	0.446	0.6
Catostomidae (sucker)	10	0.3	2	4.3	3.5	0.098	0.1
Ictaluridae (freshwater catfish)	41	1.4	5	10.7	11.3	0.234	0.3
Morone	10	0.3	2	4.3	0.9	0.014	
Sciaenidae (croaker or drum)	1		1	2.1	0.2	0.007	
Unidentified Turtle	116	3.8			52.6	0.450	0.6
Chelydra serpentina	7	0.2	1	2.1	15.5	0.198	0.3
Kinosternidae (musk or mud turtle)	12	0.4	1	2.1	5.8	0.110	0.1
Emydidae (box or water turtle)	18	0.6			9.0	0.138	0.2
Chrysemys spp. (slider or cooter turtle)	66	2.2	2	4.3	99.8	0.691	0.9
Terrapene carolina (box turtle)	145	4.8	4	8.5	302.5	1.452	1.9
Unidentified Bird	162	5.3			61.6	0.868	1.1
Cygnus spp. (swan)	1		1	2.1	0.8	0.017	
Branta canadensis (Canada goose)	3	0.1	1	2.1	1.6	0.031	
Meleagris gallopavo (wild turkey)	74	2.4	5	10.7	113.0	1.508	2.0
cf. *Corvus brachyrhynchos* (crow)	1		1	2.1	0.1	0.003	
Unidentified Mammal	940	30.9			814.7	10.962	14.4
Didelphis virginiana	4	0.1	1	2.1	3.5	0.081	0.1
Sylvilagus floridanus	4	0.1	1	2.1	2.7	0.064	0.1
Rodentia	2	0.1			0.4	0.012	
Sciurus carolinensis	3	0.1	1	2.1	0.7	0.019	
Sigmodon hispidus	2	0.1	1	2.1	0.2	0.006	
Ondatra zibethicus	3	0.1	1	2.1	0.9	0.024	
Carnivora	3	0.1			5.0	0.112	0.1
Canis	5	0.2	1	2.1	7.3	0.157	0.2
cf. *Canis latrans*	1				1.0	0.026	
Ursus americanus	1		1	2.1	4.4	0.100	0.1
Procyon lotor	2	0.1	2	4.3	8.2	0.175	0.2
Felis rufus	9	0.3	1	2.1	43.3	0.781	1.0
Odocoileus virginianus	737	24.3	8	17.0	4962.4	55.734	73.4
Unidentified Bone	405	13.3			74.0		
TOTAL	**3035**	**100.0**	**47**	**100.0**	**6744.2**	**75.884**	**100.0**

Table C-18. Feature 1, species list.

Taxon	NISP		MNI		Weight		
	N	%	N	%	grams		%
Unidentified Fish	107			17.1	7.3	0.148	1.6
Lepisosteus spp. (gar)	38	6.1	1	4.0	5.1	0.130	1.4
Catostomidae (sucker)	11	1.7	2	8.0	1.8	0.060	0.6
Ictaluridae (freshwater catfish)	30	4.8	6	24.0	6.7	0.159	1.7
Morone	21	3.3			1.9	0.028	0.3
Morone americana (white perch)	6	0.9	2	8.0	0.6	0.010	0.1
Unidentified Turtle	7	1.1			2.0	0.050	0.5
Chelydra serpentina	9	1.7	1	4.0	21.7	0.249	2.6
Kinosternon subrubrum	5	0.8	1	4.0	1.4	0.040	0.4
Chrysemys spp. (slider or cooter turtle)	5	0.8	1	4.0	4.7	0.089	0.9
Terrapene carolina (box turtle)	17	2.7	1	4.0	22.4	0.254	2.7
Unidentified Bird	48	7.7			17.2	0.272	2.9
Meleagris gallopavo (wild turkey)	26	4.1	2	8.0	26.7	0.406	4.3
Unidentified Mammal	90	14.4			57.3	1.005	10.6
Sylvilagus floridanus	1	0.1	1	4.0	0.3	0.009	0.1
Sciurus carolinensis	2	0.3	1	4.0	0.5	0.014	0.1
Castor canadensis (beaver)	1	0.1	1	4.0	0.2	0.006	0.1
Sigmodon hispidus	1	0.1	1	4.0	0.1	0.003	
Ondatra zibethicus	1	0.1	1	4.0	0.1	0.003	
Odocoileus virginianus	68	10.9	3	12.0	459.6	6.549	69.0
Unidentified Bone	129	20.7			20.4		
Total	**623**	**100.0**	**25**	**100.0**	**658.0**	**9.484**	**100.0**

Table C-19. Feature 12, species list.

Taxon	NISP		MNI		Weight		
	N	%	N	%	grams		%
Unidentified Fish	15			2.7	1.2	0.034	0.3
Lepisosteus spp. (gar)	15	2.7	1	7.7	1.9	0.063	0.6
Ictaluridae (freshwater catfish)	3	0.5	1	7.7	0.4	0.020	0.2
Morone	4	0.7			0.6	0.010	
Morone americana (white perch)	5	0.9	2	15.4	0.4	0.007	
Unidentified Turtle	44	8.0			13.2	0.178	1.7
Chelydra serpentina	4	0.7	1	7.7	1.8	0.047	0.4
Emydidae (box or water turtle)	2	0.4			17.4	0.214	2.0
Chrysemys spp. (slider or cooter turtle)	13	2.4	1	7.7	0.4	0.017	0.2
Terrapene carolina (box turtle)	12	2.2	1	7.7	18.8	0.226	2.1
Unidentified Bird	47	8.6			12.0	0.196	1.8
Meleagris gallopavo (wild turkey)	14	2.6	2	15.4	14.1	0.227	2.1
Unidentified Mammal	126	23.0			77.7	1.322	12.4
Ondatra zibethicus	3	0.5	1	7.7	0.5	0.014	0.1
Odocoileus virginianus	99	18.1	3	23.1	584.1	8.125	76.0
Unidentified Bone	141	25.8			21.8		
Total	**547**	**100.0**	**13**	**100.0**	**766.3**	**10.700**	**100.0**

Table C-20. Feature 15, species list.

Taxon	NISP		MNI		Weight		
	N	%	N	%	grams		%
Lepisosteus spp. (gar)	2	0.9	1	14.3	0.3	0.016	0.5
Ictaluridae (freshwater catfish)	1	0.5	1	14.3	0.3	0.016	0.5
Unidentified Turtle	37	17.1			8.1	0.128	3.8
Chelydra serpentina	1	0.5	1	14.3	2.3	0.055	1.6
Terrapene carolina (box turtle)	27	12.5	1	14.3	27.8	0.293	8.7
Unidentified Bird	6	2.7	1	14.3	1.0	0.020	0.6
Unidentified Mammal	79	36.5			62.0	1.079	31.9
Ondatra zibethicus	2	0.9	1	14.3	0.3	0.009	0.3
cf. *Ondatra zibethicus*	2	0.9			0.2	0.006	0.2
Odocoileus virginianus	29	13.4	1	14.3	106.9	1.762	52.1
Unidentified Bone	30	13.8			3.5		
Total	**216**	**100.0**	**7**	**100.0**	**212.7**	**3.384**	**100.0**

Table C-21. Feature 17, species list.

Taxon	NISP		MNI		Weight		
	N	%	N	%	grams		%
Lepisosteus spp. (gar)	1	3.7	1	33.3	0.1	0.007	4.7
Unidentified Turtle	1	3.7	1	33.3	0.1	0.007	4.7
Unidentified Mammal	11	40.7			5.0	0.112	75.6
Odocoileus virginianus	2	7.4	1	33.3	0.8	0.022	14.8
Unidentified Bone	12	44.4			1.0		
Total	**27**	**100.0**	**3**	**100.0**	**7.0**	**0.148**	**100.0**

Table C-22. Feature 24, species list.

Taxon	NISP		MNI		Weight		
	N	%	N	%	grams		%
Unidentified Fish	2			1.7	0.1	0.005	0.3
Lepisosteus spp. (gar)	12	10.4	1	14.3	1.1	0.042	2.5
Unidentified Turtle	3	2.6			1.3	0.038	2.3
Kinosternidae (musk or mud turtles)	1	0.9	1	14.3	0.3	0.014	0.8
Terrapene carolina (box turtle)	7	6.0	1	14.3	5.1	0.094	5.6
Unidentified Bird	15	13.0			4.0	0.072	4.3
Meleagris gallopavo (wild turkey)	3	2.6	1	14.3	6.1	0.106	6.3
Unidentified Mammal	35	30.4			25.2	0.480	28.5
Didelphis virginiana	1	0.9	1	14.3	0.4	0.012	0.7
Rodentia	1	0.9			0.1	0.003	0.2
Ondatra zibethicus	1	0.9	1	14.3	0.1	0.003	0.2
Odocoileus virginianus	10	8.7	1	14.3	45.5	0.817	48.5
Unidentified Bone	24	20.8			5.1		
Total	**115**	**100.0**	**7**	**100.0**	**94.4**	**1.686**	**100.0**

Table C-23. Feature 25, species list.

Taxon	NISP		MNI		Weight		
	N	%	N	%	grams		%
Unidentified Fish	1	4.2			0.1	0.005	0.8
Lepisosteus spp. (gar)	1	4.2	1	20.0	0.2	0.012	1.8
Unidentified Bird	2	8.3			0.9	0.019	2.9
Meleagris gallopavo (wild turkey)	3	12.5	1	20.0	1.8	0.035	5.3
Unidentified Mammal	4	16.6			1.6	0.040	6.1
Ondatra zibethicus	1	4.2	1	20.0	0.4	0.012	1.8
Felis rufus (bobcat)	1	4.2	1	20.0	2.9	0.069	10.5
Odocoileus virginianus	6	25.0	1	20.0	24.4	0.466	70.8
Unidentified Bone	5	20.8			1.2		
Total	**24**	**100.0**	**5**	**100.0**	**33.5**	**0.658**	**100.0**

Table C-24. Feature 26, species list.

Class	NISP		MNI		Biomass	
	N	%	N	%	kilograms	%
Fish	309	11.8	13	27.7	2.165	2.9
Turtle	364	13.8	8	17.0	3.039	4.0
Bird	241	9.2	8	17.0	2.427	3.2
Mammal	1716	65.2	18	38.3	68.253	89.9
Total	**2630**	**100.0**	**47**	**100.0**	**75.884**	**100.0**

Table C-25. Feature 1, summary by class.

Class	NISP		MNI		Biomass	
	N	**%**	**N**	**%**	**kilograms**	**%**
Fish	213	43.1	11	44.0	0.535	5.6
Turtle	43	8.7	4	16.0	0.682	7.2
Bird	74	15.0	2	8.0	0.678	7.2
Mammal	164	33.2	8	32.0	7.589	80.0
Total	**494**	**100.0**	**25**	**100.0**	**9.484**	**100.0**

Table C-26. Feature 12, summary by class.

Class	NISP		MNI		Biomass	
	N	**%**	**N**	**%**	**kilograms**	**%**
Fish	42	10.3	4	30.8	0.134	1.2
Turtle	75	18.5	3	23.0	0.682	6.4
Bird	61	15.0	2	15.4	0.423	4.0
Mammal	228	56.2	4	30.8	9.461	88.4
Total	**406**	**100.0**	**13**	**100.0**	**10.700**	**100.0**

Table C-27. Feature 15, summary by class.

Class	NISP		MNI		Biomass	
	N	**%**	**N**	**%**	**kilograms**	**%**
Fish	3	1.6	2	28.6	0.032	0.9
Turtle	65	35.0	2	28.6	0.476	14.1
Bird	6	3.2	1	14.2	0.020	0.6
Mammal	112	60.2	2	28.6	2.856	84.4
Total	**186**	**100.0**	**7**	**100.0**	**3.384**	**100.0**

Table C-28. Feature 17, summary by class.

Class	NISP		MNI		Biomass	
	N	**%**	**N**	**%**	**kilograms**	**%**
Fish	1	6.7	1	33.3	0.007	4.7
Turtle	1	6.7	1	33.3	0.007	4.7
Mammal	13	86.6	1	33.3	0.134	90.5
Total	**15**	**100.0**	**3**	**100.0**	**0.148**	**100.0**

Table C-29. Feature 24, summary by class.

Class	NISP		MNI		Biomass	
	N	**%**	**N**	**%**	**kilograms**	**%**
Fish	14	15.4	1	14.3	0.047	2.8
Turtle	11	12.1	2	28.6	0.146	8.7
Bird	18	19.8	1	14.3	0.178	10.5
Mammal	48	52.7	3	42.8	1.315	78.0
Total	**91**	**100.0**	**7**	**100.0**	**1.686**	**100.0**

Table C-30. Feature 25, summary by class.

Class	NISP		MNI		Biomass	
	N	**%**	**N**	**%**	**kilograms**	**%**
Fish	2	10.5	1	20.0	0.017	2.6
Bird	5	26.3	1	20.0	0.054	8.2
Mammal	12	63.2	3	60.0	0.587	89.2
Total	**19**	**100.0**	**5**	**100.0**	**0.658**	**100.0**

Table C-31. Feature 26, summary by class.

APPENDIX D

THE POTOMAC CREEK SITE (44ST2): PHYTOLITH ANALYSIS

Prepared by:
Lisa Kealhofer
Department of Archaeological Research, Colonial Williamsburg Foundation

INTRODUCTION

The Potomac Creek Site (44ST2) in Stafford County, Virginia, was excavated by the WMCAR in the winter of 1996–1997. This late prehistoric palisaded village (ca. AD 1280–1640) is located at the confluence of Potomac Creek and the Potomac River. The site provided an opportunity to investigate a number of hypotheses about the function of palisaded villages. In the late prehistoric period, Chesapeake polities have commonly been interpreted as chiefdoms based both on ethnohistorical records and archaeological data (Binford 1964; Potter 1993). Recently this interpretation has been questioned (Gallivan 1997) based on a lack of appropriately hierarchical archaeological data. At the Potomac Creek Site, it was possible to explore the nature of socio-political organization in one of the most complex sites known from the late prehistoric period in the Chesapeake.

Analyses of botanical remains can contribute to understanding the organization of complexity here by addressing issues such as: the scale of forest clearance [and land use], the significance of cultigens in the plant assemblage, the amount of specialization in site features, the diversity or homogeneity of site features, and so forth. The information contributed by microbotanical evidence depends on the sampling regime. For example, site function can be studied through comparison of samples from contemporary features across the site. Or, chronological change can be assessed within specific contexts [e.g., midden use, structure function, etc.]. Sampling regimes based on prior analyses of features, such as soil morphology, artifact content and distribution, and faunal composition often provide the most informative analyses. In any group of soil samples, two different types of information can be provided by microbotanical analyses: specific identifications of plant taxa represented in the soil samples and overall assemblage patterns revealing similarities and differences in site organization.

Potomac Creek investigators were particularly interested in identifying specific cultigens (e.g., maize) at the site, and secondarily in the vegetational/environmental change over time. Because cumulative processes create soils, an assemblage of plant remains from any stratum often represents relatively long periods of time (Butzer 1982). Only a part of the assemblage may be of specific interest. For this reason, questions that address cumulative *human* behavior are more answerable with phytolith data.

Five soil samples from different feature contexts were analyzed for phytoliths. All five contained sufficient phytoliths for quantitative analyses. The sampling regime is primarily chronological, focusing on features dated from potentially the late thirteenth through mid-seventeenth century.

BACKGROUND: PHYTOLITH ANALYSIS AND SOILS

Phytoliths consist of one of the most ubiquitous minerals on earth: silica. They are formed when plants absorb, through transpiration, hydrated silica from the soils in which they grow (Iler 1979; Jones and Handrek 1967). The silica is then deposited in and between cells in the plant. Plants vary considerably in the extent to which they deposit silica. Some plants do not deposit silica, and therefore create no phytoliths (e.g., most water plants), while others rely upon silica as the backbone of their structure (e.g., rice and many other grasses).

The pattern of silica deposition in plants tends to follow taxonomic relationships. For example, most of the species in the Moraceae family [in which figs and mulberries occur] make extremely diagnostic phytoliths, while most of the species in the Rosaceae family (apples, pears, etc.) do not (Kealhofer and Piperno in press; Piperno 1989, 1989). Phytoliths can be diagnostic to the species, genus, tribe, or family level. What makes them diagnostic is the unique shapes they take on as they fill in or surround plant cells, since plant cells are often diagnostic of their taxa.

Several other factors are of importance for interpreting soil phytolith assemblages. First, different plants produce different amounts of phytoliths. For example, many grass species produce phytoliths in abundance, as well as many different phytolith forms. For Monocots (e.g., grasses, sedges), in general, each part of the plant produces a different kind of phytolith, although not all are diagnostic. Dicots (most trees and shrubs) usually produce a narrower range of diagnostic phytolith types, often only one form. Often they do not produce as many phytoliths as Monocot taxa. This means that almost any soil collected where grasses occur will over-represent grass phytoliths relative to the amount of grass present in the habitat. Trees and shrubs, producing fewer phytoliths, will be under-represented. Over and under-representation of taxa is a problem common to pollen analysis as well.

Because so little phytolith work has been done in this region, the distribution of phytoliths (forms and frequencies) for many species is unknown. However, general silica distribution at the family and even subfamily level has been fairly well documented (Kealhofer and Piperno in press; Piperno 1988; 1989; Runge 1996). Still, a phytolith analyst must compile a reference collection of modern plant phytoliths for each biotic region in which research is undertaken. The environmental lab at the Colonial Williamsburg Foundation's Department of Archaeological Research is currently creating such a type collection.

Moving beyond the phytoliths to understanding the matrix in which they are found, the depositional process for phytoliths is critical for interpreting the patterning of phytolith assemblages across a site. Most commonly, sediments contain the phytoliths of the plants that grow in them (i.e. AA@ Horizon soils). In low-lying areas, phytoliths may be carried in and deposited through alluvial processes. Phytoliths are less commonly "blown around" than pollen, and therefore are more representative of the vegetation in the immediate area of the locus sampled. Soils, by their fundamental nature, will include a palimpsest of biological and mineral materials (Holliday 1992; Waters 1992). Soil is created by the breakdown of plant remains, among other things, in mineral sediments over a long period. This means that a single soil sample will yield plant remains representing the full duration of soil creation: wild plants or intentionally planted or deposited species, as well as weeds. Soil formation can take a variable amount of time, depending on the climate and the parent sediment; therefore many generations of plant material may have decayed into one soil horizon. In addition, sediments in gardens or on farms are often altered by human activities: leached through irrigation, enriched by manure, trash, or compost, etc.

Many factors can change the assemblage of phytoliths present in the topmost soil horizon (A). For example, construction or gardening techniques include movement of dirt from place to place. Once deposited, however, phytoliths rarely seem to move through the soil horizons, although under specific climatic and chemical conditions this could occur. Sediment samples therefore contain a broad variety of plant species, a "soil assemblage." Interpretation of sample assemblages involves attributing the various taxa present to different ways in which the plants could have been introduced to that sampling location: including both cultural and natural processes.

METHODOLOGY

The analysis of soil samples proceeded concurrently with the ongoing process of type collection creation. First, modern indigenous and exotic plants from the Piedmont and Tidewater regions of Virginia were collected to create a reference collection of taxonomically diagnostic phytoliths. Plants were chosen for this collection on the basis of several criteria:

1) plant distribution and ubiquity data available for the James River/Tidewater region;

2) exotic plants documented in correspondence, accounting records, diaries, etc. among Colonial era gardeners and merchants (Meatyard and Brown 1994, Meatyard 1994; Martin 1991); and

3) known distribution of phytoliths within these plants (Kealhofer and Piperno in press; Piperno 1988, 1989).

The generous assistance of the staff and volunteers at Colonial Williamsburg, the Herbarium of the College of William and Mary, the Thomas Jefferson Center for Historic Plants at Monticello, and from the gardening staff at Monticello made the collection of these reference plants possible. Over 1,000 samples have presently been collected. About 75%

of these have been analyzed. Even this large collection, however, is only a small sample of the species present in local habitats. Creating a reference collection is a continuing process as we build our type collection to improve the identification of phytoliths from soil samples.

The second part of the analysis centered on the sediment samples from Potomac Creek Site contexts. As noted above, the main task was to see if cultigens could be identified in these samples (particularly *Zea mays*) and if meaningful variability occurred in plant distributions over time. Blanton chose five samples to represent a chronological range of contexts identified during excavations. These included:

Provenience	**^{14}C (2F)**	**Context**
Feature 1, Section E	AD 1280–1415	Perimeter ditch midden
Feature 4, Section B	AD 1300–1455	Palisade trench
Feature 10, Section B	AD 1455–1655	Palisade trench
Feature 12A, West Half	AD 1425–1640	Pit
Feature 14E, East Half	No date	Small pit feature

The samples were processed according to standardized techniques outlined in Piperno (1988), with a few modification in chemicals used and processing times. Soil processing required approximately one month before identification and quantification of the phytoliths could occur. After removal from the sediment matrix, the phytoliths were mounted on microscope slides, rotated, and viewed at 400X magnification. The phytolith types present were identified when possible, assigned a descriptor if not, and counted and photographed. In order to get a good representation of the range and distribution of phytoliths present, approximately 200 diagnostic phytoliths were counted per slide. In addition, diatoms, sponge spicules, spores, and starches were quantified but not identified.

RESULTS

All five submitted samples contained a sufficient quantity of phytoliths to make 200 counts. In general, phytoliths were not common in these sediments. Preservation was good.

In terms of overall content, grasses dominated these samples. The total Potomac Creek assemblage was not particularly diverse, with 15 Dicot/arboreal types complementing the 33 grass taxa identified (Table D-1). The greatest abundance and diversity present is associated with the Panicoid subfamily of grasses. (Types include: 4ptCross, tall multilobates, 3:2 lobates, tall2pt bilobates, large 2-cell hairs, and line-bilobates, as well as other forms). More specifically, it is likely that many of the taxa are specifically related to the Panicoid cultigen *Zea mays*. While forms associated with *Zea* dominate this diversity, quantitatively *Zea* diagnostic forms only contribute from 5–10% of the total count. Other synthetic categories, e.g., “bilobates”, probably include *Zea* types that are not easily differentiated. Therefore the 5–10% rather underestimates the contribution of *Zea* to the grass assemblage.

Extrapolating environment from archaeological samples can be extremely problematic. The cultural nature of these deposits introduces the likelihood that the plants found better represent cultural activities that concentrated plants rather than a “natural” environment. If we look at the general plant background represented in all these samples, and ignore the problems, the presence of both arboreal and grass types indicates an open forest environment, or a mosaic of forest and field.

The assemblage of Panicoid grasses across these samples varies somewhat (see Table D-1). Feature 4 contains a significantly different set of Panicoid taxa than the other features (and Chloridoid grasses as well). Features 1 and 14 contain the most diagnostic evidence for maize (more types), while Feature 12 has the greatest abundance of diagnostics. The distribution of various maize forms suggests that the features contained somewhat different parts of the maize plant (cob, husk). For example, Features 4 and 12 have the most types associated with cobs [C-C]. More detailed measurements might further discriminate these parts. No obvious trends of increasing or decreasing maize use are apparent in these data, rather the variability in the samples seems to represent changing patterns of disposal or possibly processing.

Potomac Creek: February 1998	F1E	F4B	F10B	F12A	F14E
	335	**336**	**337**	**338**	**339**
Grasses					
Panicoid					
Crosses	4	10	4	7	8
Bilobates*	66	80	53	58	65
T Bil: circ	7	3	1		0
3:2	1		3	1	3
Irregular lobate	1				4
T2ptB	2		3	3	1
T4ptB		1			
2-cell hair	4	1	1	2	
Possible Zea					
T4ptCross (*Zea*?)	1				1
T2ptCross					1
Bag 2CHr	1				
T Irreg lobate	2				1
Trilobates				2	
T Trilobe: circ	1				
T6ptB				1	
Clover/3L				4	1
TNO-o	1	2			2
TC-C	2				
C-C	1	10	8	10	7
Pooid					
Pooid Plate/Ptd	31	31	31	29	38
Pooid Rondel	5	12	20	17	18
TNPooid			1		
Chlor/Hbil	29	15	33	29	28
Chloridoid saddle		3			
Other Grass					
TC-c	1	1		2	
TC-o		1			
C-c		5	3		
O-o	2		3	2	3
O-c			5	7	2
O-2pt				2	
TO-o		1			
TC-sq					2
T2ptC		3		3	
Herbaceous					
SRS	4	5		1	1
Sedge achene					1
Arboreal					
Palm-like	1		3	1	1
SSS	1	1	3		
LRS	4	4	3		2
LSS	1	2	2		1
Tab Sphere		2			
Sclereid	19	4	4	1	2
Armed hair cell				2	1
UNID1-dimpled sphere	2				
UNID2-flat irreg bodies	2				
UNID3-sphenoid	1				
UNID4-carapace			6	5	1
UNID5-tapered tube			4		
UNID6-bagshapes		1			
UNID7-rough hemisph			1	1	
UNID8-faceted hemisph				1	
UNID9-irreg holey elongates					5
UNID-other	5	6	7	11	6
Totals	202	204	202	202	206
Sponge spicules	NC-frags	NC-C	NC	NC	NC-R
Spores	1		5		
Diatoms	12	7	4	1	8
Tracheid				1	1
Starch grains	30	5	10	3	4
Burned silica		3			

Table D-1.

If the samples are viewed in sequence, no real trends are apparent. Only one taxon, the inflorescence of Pooid grasses, changes in a linear fashion, increasing from Feature 1B to Features 10 and 12. The significance of this increase in Pooid rondels/inflorescence phytoliths may be due to a variety of causes, including changes in specific species represented, a decrease in management of weeds [more live to flower], or increased economic use of specific taxa.

Significant differences exist between samples, but in general they are unique or not sequential. The only possible exception is that Feature 1 contains a much higher count of sclereids, an arboreal indicator, than any other sample. However, given the midden context, and the location below (?) and between palisade features, it is very difficult to know the significance of this concentration. For example, it is possible that part of the in-fill of the ditch was associated with palisade material, rather than providing an environmental indicator. Comparative sampling outside the feature contexts might resolve this problem.

No significant differences exist between the Pooid grass leaf assemblages in these samples, except an increase in the Feature 14 sample (nd). Without other contextual information Feature 14 is not interpretable. The other samples seem to represent a weedy background present throughout the site, and perhaps the local environment through the periods represented.

Pooid grasses tend to be found in cooler and drier environments of temperate zones. Panicoid grasses tend to be found in subtropical areas, enjoying warmer wetter environments, and Chloridoid species are most common in seasonally hot dry habitats. After European contact, Pooid grasses came to dominate most cultural environments. Their distribution relative to Panicoid grasses here reflects an environment with cold dry winters and areas open to the sunlight.

Dicot/arboreal types [shrubs and trees] represent from 10–21% of the various samples. They are most abundant in Features 1 and 10. These two samples each contain about twice as many arboreal types as the remaining three (Features 4, 12, and 14). A 20% concentration is quite high in occupation sites, since grass abundance is always high in phytolith assemblages. It is tempting to associate these high counts with the palisades, but the link is not straightforward. While one palisade trench does contain a high count, the other, Feature 4, does not. Nor do the two samples with high concentrations contain the same taxa. A variety of interpretations are possible. The fill sampled from Feature 4 may better represent redeposited cultural material rather than the palisade it was created for and possibly the palisade was short lived. The change in arboreal forms from Feature 1 to Feature 10 suggests that different trees were being used in these contexts. These two samples also show the greatest diversity of arboreal taxa. Features 4 and 10 contain more overlap in arboreal types, if not in frequencies.

Herbaceous types are relatively generic and form only a small percentage of the assemblage (0–3%). Features 1 and 4 contained the most herbaceous material.

In addition to phytoliths, several other types of microfossils were quantified: sponge spicules, spores, diatoms, and starch grains. Sponge spicules in these samples were not common and were highly fragmented, suggesting the sediments were not perennially wet and that they may be derived from other contexts. This is supported by the low diatom counts. Feature 1 has a somewhat higher diatom concentration. Starch grains reveal the greatest differences between these samples. Feature 1 has 3–10 times as many starch grains as the other samples. A range of sizes and forms were represented here, suggesting that a variety of taxa [possibly economic] are represented. In all plants, roots and seeds/fruit are the primary producers of starch grains, as focal points of plant energy storage. The abundance of starch in Feature 1 confirms its uniqueness relative to the other samples (and greater diversity of plant material). This uniqueness is potentially artificially augmented by better preservation conditions.

In order to reveal the patterning among samples, the samples were also subjected to correspondence analysis (Wright 1994). The results are graphically demonstrated in Figures D-1 through D-4. These graphs are scattergrams of the values of the 1st through 3rd eigenvalues, accounting for 83% of the variability in these samples. That three eigenvectors account for this much of the variability clearly illustrates the strong patterning in this data set. Figure D-1 shows the distribution of samples according to the 1st and 2nd eigenvalues, and Figure D-2 shows the phytolith types that account for the sample relationships shown in Figure D-1. Figures D-3 and D-4 represent these data for the 2nd and

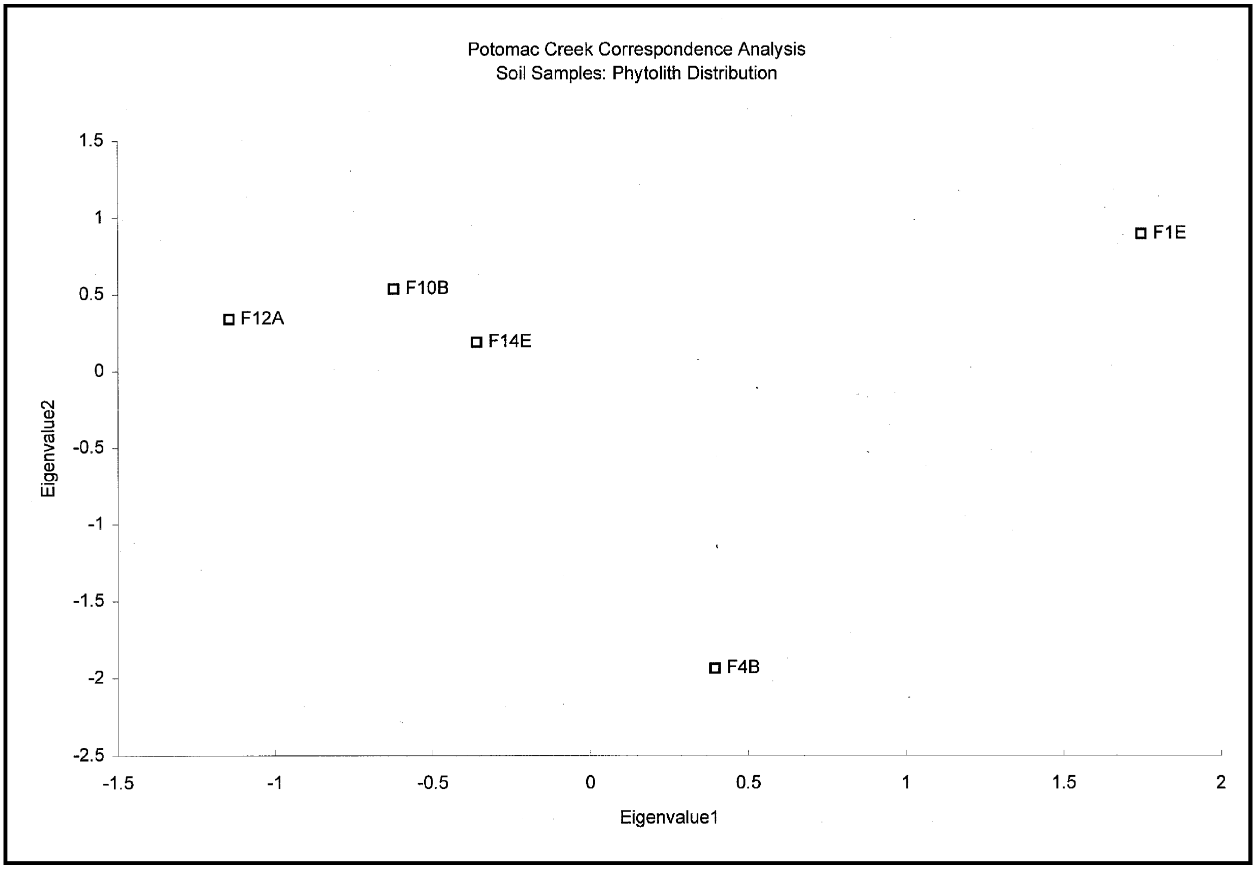

Potomac Creek Correspondence Analysis
Soil Samples: Phytolith Distribution
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
Eigenvalue2
-1.5
-1
-0.5
0
0.5
1
1.5
2
Eigenvalue1
F1E
F10B
F12A
F14E
F4B

Figure D-1.

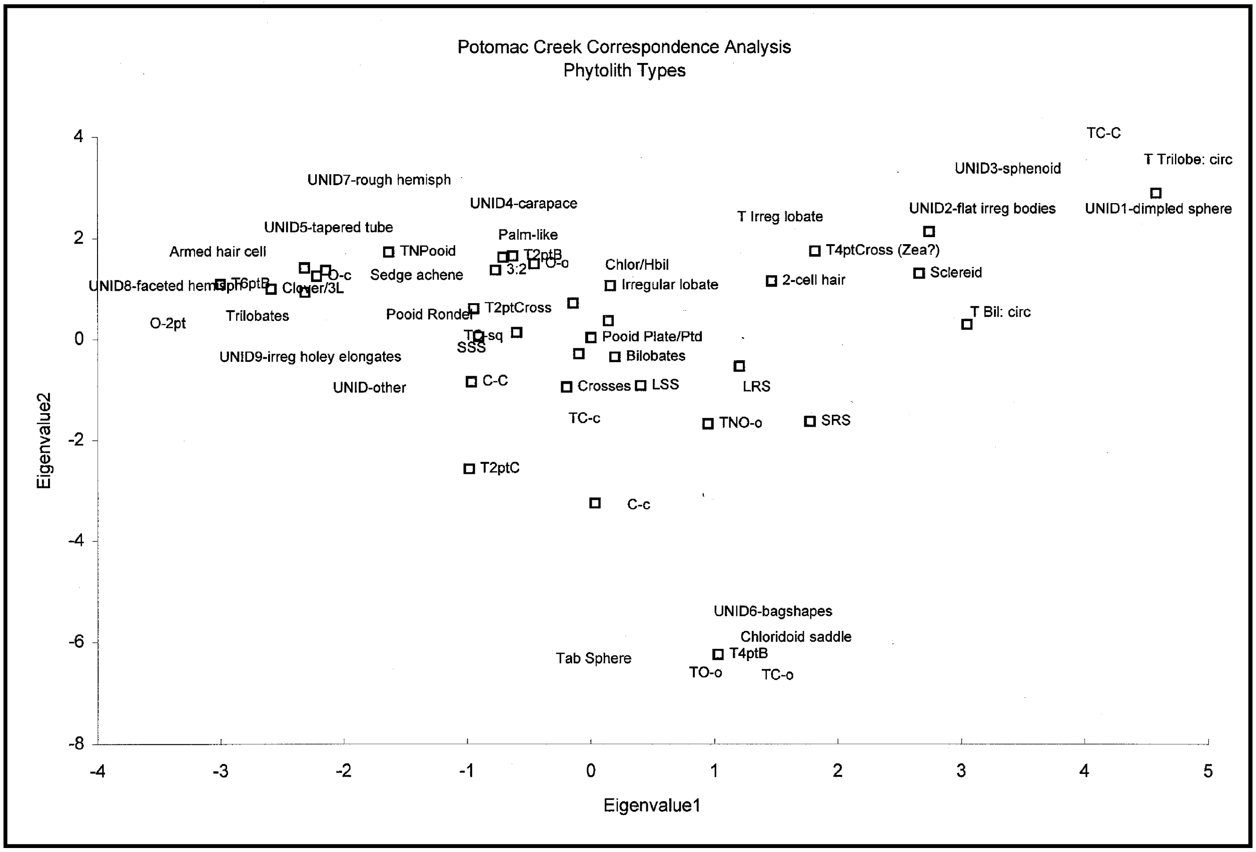

Potomac Creek Correspondence Analysis
Phytolith Types
Eigenvalue1
Eigenvalue2
TC-C
T Trilobe: circ
UNID3-sphenoid
UNID1-dimpled sphere
UNID2-flat irreg bodies
UNID7-rough hemisph
UNID4-carapace
T Irreg lobate
UNID5-tapered tube
Palm-like
T4ptCross (Zea?)
Armed hair cell
TNPooid
T2ptB
Sclereid
O-c
3:2
O-o
Chlor/Hbil
Sedge achene
2-cell hair
UNID8-faceted hemisph
T6ptB
Clover/3L
Irregular lobate
T Bil: circ
O-2pt
Trilobates
Pooid Rondel
T2ptCross
TC-sq
SSS
Pooid Plate/Ptd
UNID9-irreg holey elongates
Bilobates
C-C
Crosses
LSS
LRS
UNID-other
TC-c
TNO-o
SRS
T2ptC
C-c
UNID6-bagshapes
Chloridoid saddle
T4ptB
Tab Sphere
TO-o
TC-o

Figure D-2.

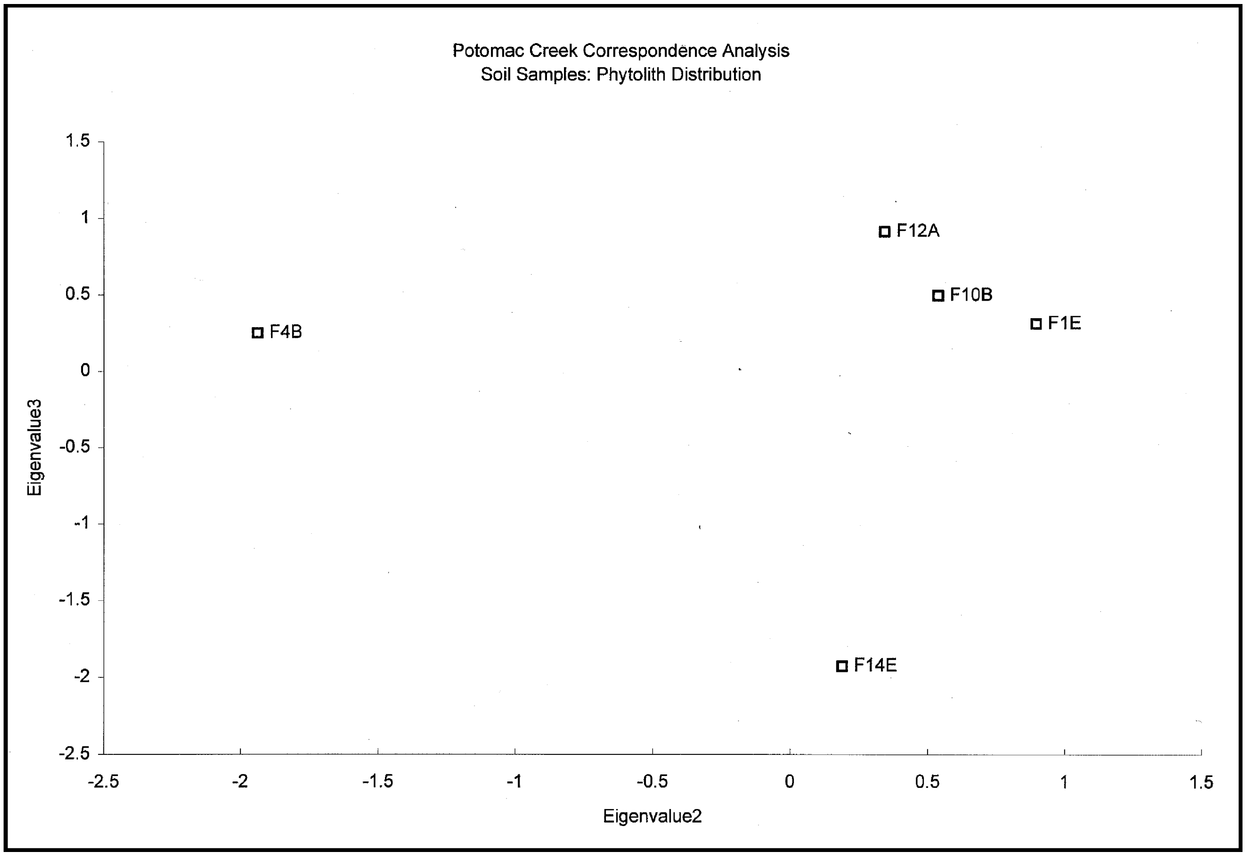
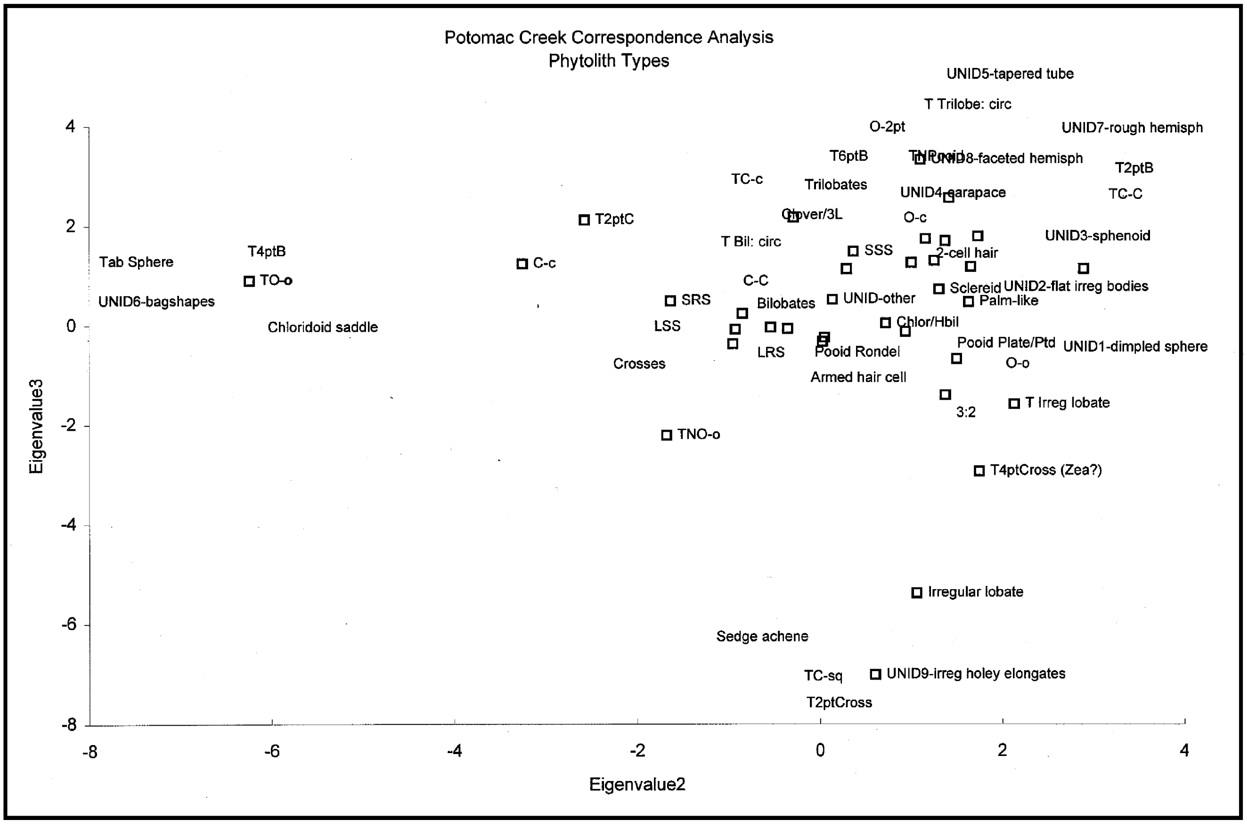

Potomac Creek Correspondence Analysis
Soil Samples: Phytolith Distribution
F12A
F10B
F1E
F4B
F14E
1.5
1
0.5
0
-0.5
-1
-1.5
-2
-2.5
Eigenvalue3
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
Eigenvalue2

Figure D-3.



Potomac Creek Correspondence Analysis
Phytolith Types
Eigenvalue2
Eigenvalue3
UNID5-tapered tube
T Trilobe: circ
O-2pt
UNID7-rough hemisph
T6ptB
UNID8-faceted hemisph
T2ptB
TC-c
Trilobates
UNID4-carapace
TC-C
Clover/3L
O-c
T2ptC
UNID3-sphenoid
T Bil: circ
SSS
2-cell hair
Tab Sphere
T4ptB
C-c
TO-o
C-C
Sclereid
UNID2-flat irreg bodies
UNID6-bagshapes
SRS
Bilobates
UNID-other
Palm-like
Chloridoid saddle
LSS
Chlor/Hbil
Pooid Plate/Ptd
UNID1-dimpled sphere
LRS
Pooid Rondel
O-o
Crosses
Armed hair cell
T Irreg lobate
3:2
TNO-o
T4ptCross (Zea?)
Irregular lobate
Sedge achene
TC-sq
UNID9-irreg holey elongates
T2ptCross

Figure D-4.

3rd eigenvalues. In Figure D-3 the relationships are differentiated along other vectors, and the samples show more structural differences.

In Figure D-1, the distribution of samples can be interpreted in light of the phytolith distribution (Figure D-2). Features 10, 12, and 14 form a small cluster at the top right, while Features 1 and 4 are each unique. The cluster includes a specific set of arboreal forms, as well as sedges and grasses. Panicoid grass types and one particular dicot form (possibly associated with Piperaceae) characterize Feature 4. Feature 1 has the strongest *Zea mays* signature, and also includes a unique dicot assemblage. In general terms, this suggests that the deposits of Features 10, 12, and 14 are very similar in content, while Features 1 and 4 are quite distinct. Feature 4 is potentially less diverse than Feature 1, and may represent a shorter period of time, or fewer activities.

Figure D-3 potentially provides a slightly different picture of the assemblage, accounting for different aspects of variability in the samples. In this diagram, Features 1, 10, and 12 form a group, and Features 4 and 14 are unique. Feature 4 is unique for the same reasons it was in Figure D-1, while Feature 14 is defined by sedges and an odd assortment of grass phytoliths [mainly Panicoid]. The Feature 1/10/12 cluster seems to be mostly defined by the arboreal types that are present, despite the abundance of grass taxa (in part predicted by the dicot descriptions above). The types of *Zea* phytoliths present in these samples are very similar, as is their overall distribution of grasses.

SUMMARY AND INTERPRETATIONS

Phytolith analyses of these samples suggest that some interesting patterns of variability are present across the features sampled. Features 1, 4, and 14 are unique, both in types present and in their frequency of plant taxa. Features 10 and 12, on the other hand, are more homogeneous and similar to each other. The lack of clear change over time suggests that these samples represent relatively specific, and disparate, types of deposits.

The main evidence for cultigens is the presence of diverse phytolith types associated with *Zea mays* cobs and husks. Few distinctive leaf phytoliths were found, suggesting that processing of the plant occurred elsewhere. It is difficult to estimate the contribution of maize to the deposit, given the nature of soil formation; however, taxa were common in every sample. No clear pattern of change is evident in maize over time, although diagnostic types are most abundant in the latest (dated) sample. UNID6 may be a legume phytolith, but it is so rare that little can be said.

As noted above, reconstructing environments on the basis of cultural deposits is highly problematic. The range of species present indicates that both open areas and forest were likely nearby. While some evidence of moist environments occurs (diatoms and spicules), these are much less common than at other river edge sites (e.g., Yorktown). The relative abundance of arboreal taxa (although somewhat variable), indicates that either trees were extensively used in construction [as expected], or that they were abundant on or near the site. There is little evidence in these cultural deposits of environmental change over time.

Phytolith preservation is good, and the phytolith assemblage is certainly abundant and diverse enough for valid analyses. Future work might benefit from sampling designs that are more focused on research issues, capitalize on archaeological data acquired during excavations, and make use of a larger and more representative set of samples. If environmental change is sought, then sampling nearby non-cultural depositional environments would provide a more appropriate context for sampling. If activity area complexity is part of the research strategy, then sampling a wide variety of contemporary feature and floor deposits would be more effective. A complex and diverse site, such as Potomac Creek, requires a larger and more complex sampling strategy if meaningful questions are to be addressed and answered.

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APPENDIX E

Provenience	Z-Twist		S-Twist		Total
	No.	*Frequency*	*No.*	*Frequency*	*No.*
Data Recovery					
Feature 1, Section B*	43	100.00	--	--	43
Feature 1, Section I	2	100.00	--	--	2
Feature 1, Section J	2	100.00	--	--	2
Feature 1, Section K	2	66.67	1	33.33	3
Feature 1, Section L	16	100.00	--	--	16
Feature 1, Section G	6	100.00	--	--	6
Feature 1, Section H	53	92.98	4	7.02	57
Feature 1, Section M	3	100.00	--	--	3
Feature 1, Section E	55	100.00	--	--	55
Feature 1, Section C	2	100.00	--	--	2
Feature 1 Subtotal	184	97.35	5	2.65	189
Feature 12	3	100.00	--	--	3
Feature 15	2	100.00	--	--	2
Feature 17	2	100.00	--	--	2
Data Recovery Subtotal	191	97.45	5	2.55	196
Intensive Survey (CRI)					
Plow Zone-Midden/B Horizon Interface	65	98.48	1	1.52	66
Testing (H.A. MacCord)					
Unit D	182	94.30	11	5.70	193
Total	438	96.26	17	3.74	455

*Feature 1 excavation sections are ordered counter-clockwise, from north to west.

Table E-1. Potomac Creek Site (44ST2), number and frequency of final Z-twist and S-twist cordage displayed on Potomac Creek Cord-Marked ceramics from various excavations by provenience.

PROVENIENCE	DIRECT CORD DECORATION				PSEUDO-CORD DECORATION				TOTAL CORDED DECORATION				TOTAL
	Z-Twist		S-Twist		Z-Twist		S-Twist		Z-Twist		S-Twist		
	No.	*Freq.*	*No.*	*Freq.*	*No.*	*Freq.*	*No.*	*Freq.*	*No.*	*Freq.*	*No.*	*Freq.*	*No.*
Data Recovery													
Feature 1, Section B*	1	50.00	1	50.00	1	100.00	--	--	2	66.67	1	33.33	3
Feature 1, Section I	1	50.00	1	50.00	--	--	--	--	1	50.00	1	50.00	2
Feature 1, Section K	1	100.00	--	--	2	100.00	--	--	3	100.00	--	--	3
Feature 1, Section G	1	50.00	1	50.00	2	100.00	--	--	3	75.00	1	25.00	4
Feature 1, Section H	2	100.00	--	--	--	--	--	--	2	100.00	--	--	2
Feature 1, Section M	2	100.00	--	--	--	--	--	--	2	100.00	--	--	2
Feature 1, Section E	--	--	--	--	1	50.00	1	50.00	1	50.00	1	50.00	2
Feature 1, Section C	--	--	1	100.00	--	--	--	--	--	--	1	100.00	1
Feature 1, Subtotal	8	66.67	4	33.33	6	85.71	1	14.29	14	73.68	5	26.32	19
Feature 5	1	100.00	--	--	--	--	--	--	1	100.00	--	--	1
Feature 12	2	100.00	--	--	2	100.00	--	--	4	100.00	--	--	4
Feature 15	--	--	--	--	1	100.00	--	--	1	100.00	--	--	1
Feature 17	--	--	--	--	1	100.00	--	--	1	100.00	--	--	1
Data Recovery Subtotal	11	73.33	4	26.67	10	90.91	1	9.09	21	80.77	5	19.23	26
Intensive Survey (CRI)													
Plow Zone-Midden/ B Horizon Interface	8	61.54	5	38.46	13	92.86	1	7.14	21	77.78	6	22.22	27
Testing (H.A. MacCord)													
Unit D Subtotal	27	87.10	4	12.90	30	88.24	4	11.76	57	87.69	8	12.31	65
Total	46	77.97	13	22.03	53	89.83	6	10.17	99	83.90	19	16.10	118

* Feature 1 excavation sections are ordered counter-clockwise, from north to west.

Table E-2. Potomac Creek Site (44ST2), number and frequency of final Z-twist and S-twist cordage employed in corded decoration on Potomac Creek ceramics from various excavations by provenience.

Provenience	Z-Twist		S-Twist		Total
	No.	*Freq.*	*No.*	*Freq.*	*No.*
Data Recovery, Feature 1, Section B	--	--	1	100.00	1
Data Recovery, Feature 15	--	--	1	100.00	1
Total	**--**	**--**	**2**	**100.00**	**2**

Table E-3. Potomac Creek Site (44ST2), number and frequency of final Z-twist and S-twist replied cordage employed in corded decoration on Potomac Creek ceramics from various excavations by provenience.

Pottery Type	Provenience	Z-Twist		S-Twist		Total
		No.	*Freq.*	*No.*	*Freq.*	*No.*
Keyser Cord-Marked	Data Recovery, Feature 5	--	--	1	100.00	1
Rappahannock Fabric- Impressed	Intensive Survey, Plow Zone-Midden/ B Horizon Interface	--	--	1	100.00	1

Table E-4. Potomac Creek Site (44ST2), number and frequency of final Z-twist and S-twist displayed by surface finishes on shell-tempered ceramics by pottery type and provenience.

	Data Recovery Feature 1	Intensive Survey Plowzone/Midden Interface	Total
Range in cord diameter:	1.0–2.9 mm	1.2–2.7 mm	1.0–2.9 mm
Mean cord diameter:	1.92 mm	1.88 mm	1.88 mm
Standard deviation:	0.4245	0.4170	0.4664
Number of measurements:	124	27	151
Range in ply diameter:	0.7–2.2 mm	0.7–1.9 mm	0.7–2.2 mm
Mean ply diameter:	1.42 mm	1.35 mm	1.36 mm
Standard deviation:	0.4510	0.3534	0.4822
Number of measurements:	132	27	159
Range in cord twist angle:	12–48°	9–39°	9–48°
Mean cord twist angle:	23.71°	25.00°	23.01°
Standard deviation:	7.4181	6.7880	8.3630
Number of measurements:	123	27	150

Table E-5. Potomac Creek Site (44ST2), measurements of two-ply final Z-twist cordage impressions derived from Potomac Creek Cord-Marked sherds.

Description	Final Z Twist	Final S Twist	Total
Range in cord diameter:	1.1-3.3 mm	1.4-2.0 mm	1.1–3.3 mm
Mean cord diameter:	1.97 mm	1.78 mm	1.93 mm
Standard deviation:	0.4419	0.2333	0.4128
Number of measurements:	35	9	44
Range in ply diameter:	0.6–2.6 mm	1.1–1.6 mm	0.6–2.6 mm
Mean ply diameter:	1.42 mm	1.25 mm	1.38 mm
Standard deviation:	0.3753	0.1620	0.3491
Number of measurements:	37	9	46
Range in cord twist angle:	18-68°	23-34°	18–68°
Mean cord twist angle:	33.24°	30.33°	32.63°
Standard deviation:	11.9723	7.6485	11.1889
Number of measurements:	34	9	43

Table E-6. Potomac Creek Site (44ST2), measurements of decorative two-ply direct cord impressions derived from Potomac Creek sherds by final twist direction.

Description	Final Z Twist	Final S Twist	Total
Range in cord diameter:	0.5-2.3 mm	0.9-2.2 mm	0.5-2.3 mm
Mean cord diameter:	1.31 mm	1.66 mm	1.35 mm
Standard deviation:	0.3971	0.4980	0.4184
Number of measurements:	38	5	43
Range in ply diameter:	0.6-1.8 mm	0.6-1.6 mm	0.6-1.8 mm
Mean ply diameter:	0.93 mm	1.18 mm	0.97 mm
Standard deviation:	0.3004	0.3633	0.3150
Number of measurements:	34	5	39
Range in cord twist angle:	23-60°	19-52°	19-60°
Mean cord twist angle:	42.21°	29.40°	40.56°
Standard deviation:	12.1600	13.0115	12.8469
Number of measurements:	34	5	39

Table E-7. Potomac Creek Site (44ST2), measurements of decorative two-ply pseudo cord impressions derived from Potomac Creek sherds by final twist direction.