Chapter 4
Discrete Feature Contexts and Site Structure at the Ashe Ferry Site

The 2010 investigations at 38YK533 designated 81 discrete archaeological features evident as soil disturbances intrusive into the subsoil horizon (Figures 4.1, 4.2, 4.3; Table 4:1; Appendix B). These intrusions were identified as potential cultural features on the basis of apparent morphology, soil matrices, or content evident upon removal of overlying plowzone or other overburden deposits. Excavation determined that 52 of these features were of cultural origin or contained deposits of cultural origin; 29 soil disturbances were determined to be probable natural tree root molds, stumpholes or disturbances from uprooted tree collapse. The 52 cultural features are attributable to multiple site occupations during the Late Archaic (n=1), the Middle Woodland (n=1), the Late Woodland (n=37), and Mississippian (n=9) periods, but comprise relatively few discrete formal and functional classes, including fire-cracked or burned rock concentrations (i.e., rock hearths) (n=13), large storage pits (n=8), shallow basins and small pits (n=16), postholes (n=9), graves (n=3), and caches (n=2).

The unique depositional situation at 38YK533, with modern flood-deposited coarse sands that cap a shallow pre-1916 plowzone, protected the site from the effects of mechanized plowing, and resulted in preservation of discrete archaeological contexts normally obliterated on most sites in the region. Even slightly deeper plowing of the site matrix would have eliminated most of the discrete facilities, particularly the shallow rock-filled basins and other roasting facilities, thereby severely constraining interpretability of site structure and function. However, because the subplowzone matrix at 38YK533 is relatively coarse grained and highly permeable, it is subject to excessive leaching, and the margins of older soil disturbances were indistinct due to the progressive migration of finer particles and organic material through percolation. As a consequence, the morphologies of many cultural features were difficult to distinguish, and it is possible that some features with especially low artifact content and low organic matter content went undetected despite intense scrutiny of the subplowzone surface. For example, a cluster of Late Archaic period lithic artifacts (Feature 80) likely represents the location of a pit, posthole, or tree stumphole, but the surrounding matrix could not be differentiated from the larger site matrix. Likewise, a cluster of Middle Woodland period Deptford series ceramic sherds (Feature 58) recovered from the general subplowzone matrix almost certainly marked a highly leached pit location. This uniform and progressive taphonomic effect of soil leaching likely precluded definition of some smaller, lower density contexts (e.g., postholes), rendering site structure potentially less coherent and less interpretable.

Rock-filled roasting facilities (n=13)

Thirteen shallow, cobble-filled basins or surfaces with clusters of fire-cracked rocks (Features 12, 13, 15, 17, 21, 25, 47, 51, 53, 55, 74, 77, and 78) are interpreted as rock ovens or hearths used as heating or cooking facilities (Figure 4.4). As documented in the ethnographic and ethnohistoric records, such facilities were used to either dry roast or steam large quantities of foodstuffs without direct flame (see Smith 2000; Thoms 2007, 2008, 2009; Wandsnider 1997). The stones in such facilities provided thermal mass heated by an initial high intensity firing (typically above 400ºC), after which food could be loaded into the bed of hot cobbles, ashes, and coals and either roasted in open air for shorter term supervised cooking or covered with vegetable material and soil for insulation for longer term baking. Recovery of cooked foods from such facilities disrupted oven coverings and ash matrixes, but generally left the cobble

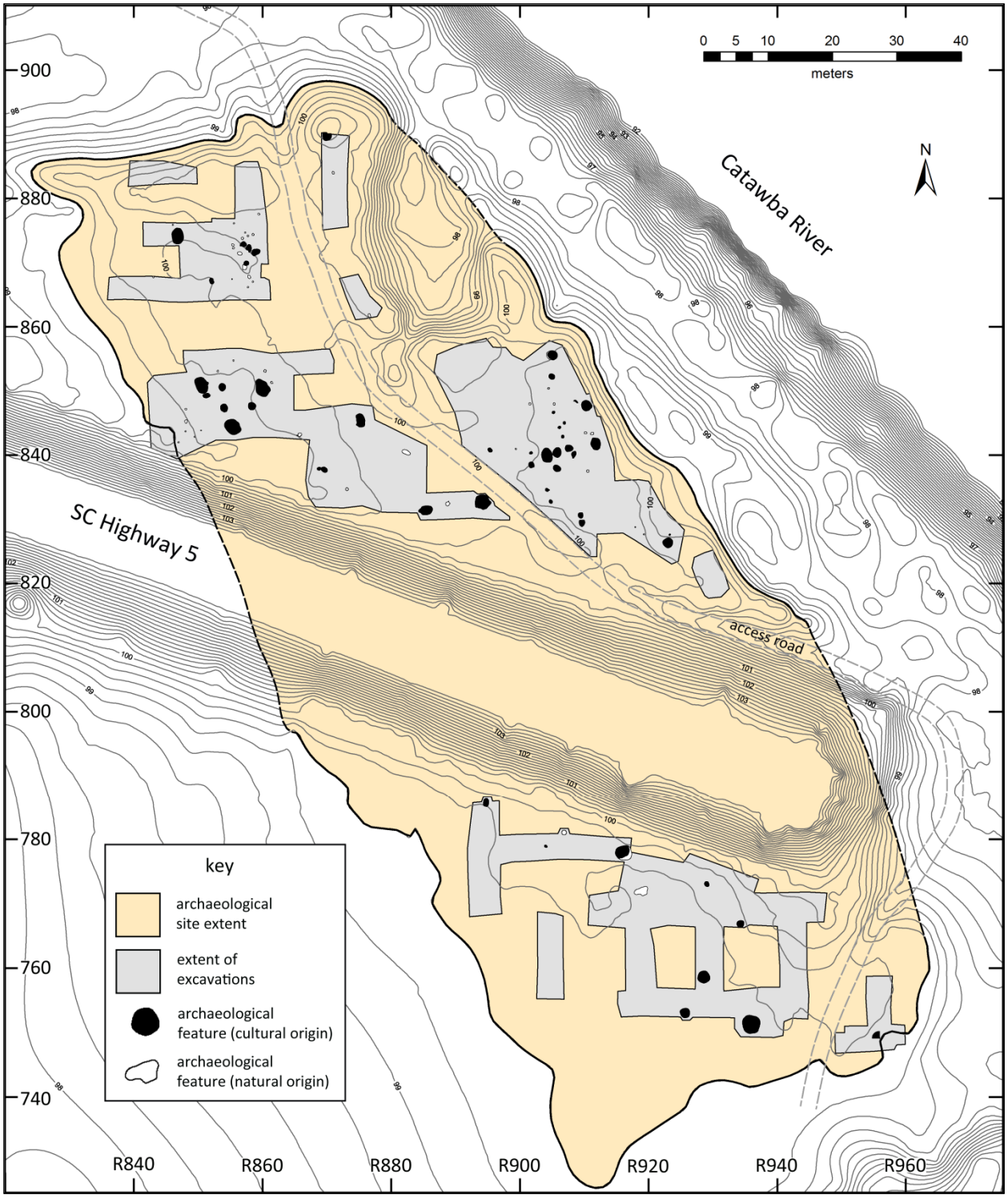

Figure 4.1. Plan of 38YK533 indicating locations of discrete archaeological features.

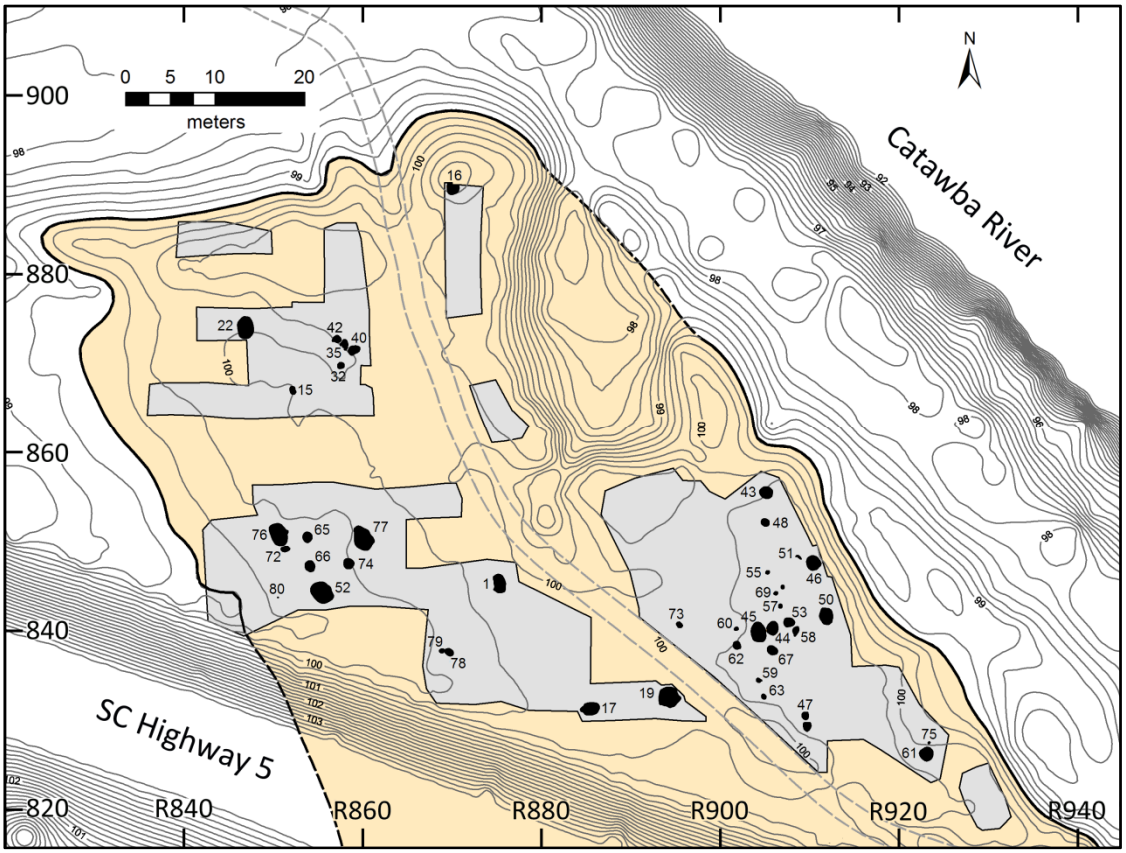

Figure 4.2. Detail of the northern half of the 38YK533 site plan indicating locations of discrete archaeological features (cultural origin only), with numeric designations (as referenced in Table 4.1).

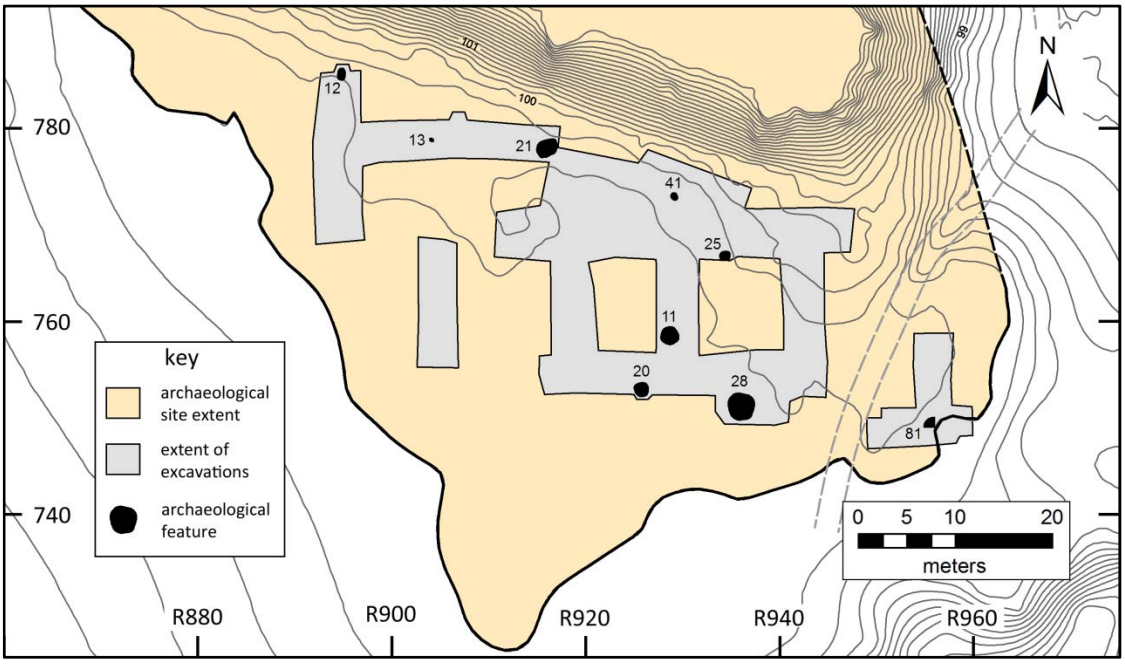

Figure 4.3. Detail of the southern half of the 38YK533 site plan indicating locations of discrete archaeological features (cultural origin only), with numeric designations (as referenced in Table 4.1).

Table 4.1. Discrete archaeological features designated at 38YK533.

Feature	Location	length (cm)	width (cm)	depth (cm)	formal description (functional interpretation)	temporal period cultural phase
1	845.30R875.30	210	130	9	basin	Late Woodland period Ashe Ferry phase (Woodstock)
2	832.33R888.82	63	58	15	natural disturbance (tree/root mold)	n/d
3	850.27R904.53	30	30	10	natural disturbance (tree/root mold)	n/d
4	847.88R901.65	35	35	20	natural disturbance (tree/root mold)	n/d
5	867.63R843.13	27	23	31	natural disturbance (tree/root mold)	n/d
6	875.79R846.13	24	19	21	natural disturbance (tree/root mold)	n/d
7	861.66R876.69	60	39	20	natural disturbance (tree/root mold)	n/d
8	854.62R855.56	28	20	n/d	natural disturbance (tree/root mold)	n/d
9	852.97R853.16	30	23	12	natural disturbance (tree/root mold)	n/d
10	853.04R860.48	42	42	n/d	natural disturbance (tree/root mold)	n/d
11	758.60R928.56	180	180	60	pit (storage/processing facility)	Late Woodland period Ashe Ferry phase
12	785.63R894.87	120	60	10	fire-cracked rock concentration (roasting facility)	Late Woodland period Ashe Ferry phase
13	778.73R904.14	50	35	5	fire-cracked rock concentration (roasting facility)	not determined
14	883.89R871.08	42	33	12	natural disturbance (tree/root mold)	n/d
15	867.11R852.11	90	65	<8	fire-cracked rock concentration (roasting facility)	Late Woodland period Ashe Ferry phase
16	889.59R870.02	140	135	10	basin (roasting facility)	Late Woodland period Ashe Ferry phase
17	831.22R885.50	190	150	23	fire-cracked rock concentration (roasting facility)	Late Woodland period Ashe Ferry phase
18	843.01R865.81	62	56	n/d	natural disturbance (tree/root mold)	n/d
19	832.71R894.41	260	200	10	basin (roasting facility)	Late Woodland period Ashe Ferry phase
20	752.99R925.82	160	160	48	pit (storage/processing facility)	Late Woodland period Ashe Ferry phase
21	777.80R915.80	135	120	5	fire-cracked rock concentration (roasting facility)	Late Woodland period Ashe Ferry phase

Table 4.1. Discrete archaeological features designated at 38YK533.

Feature	Location	length (cm)	width (cm)	depth (cm)	formal description (functional interpretation)	temporal period cultural phase
22	874.00R847.00	220	170	11	basin (roasting facility)	Late Woodland period Ashe Ferry phase
23	866.93R858.59	22	20	10	natural disturbance (tree/root mold)	n/d
24	867.33R855.31	25	20	16	natural disturbance (tree/root mold)	n/d
25	766.76R934.29	110	110	12	fire-cracked rock concentration (roasting facility)	Late Woodland period Ashe Ferry phase
26	867.54R858.03	30	24	5	natural disturbance (tree/root mold)	n/d
27	866.07R857.84	35	25	9	natural disturbance (tree/root mold)	n/d
28	751.11R936.01	280	280	105	pit (storage/processing facility)	Late Woodland period Ashe Ferry phase
29	874.28R858.62	35	35	8	natural disturbance (tree/root mold)	n/d
30	771.80R918.92	100	100	70+	natural disturbance (tree/root mold)	n/d
31	874.58R857.35	18	18	4	natural disturbance (tree/root mold)	n/d
32	869.79R857.57	72	72	11	basin	Late Woodland period Ashe Ferry phase
33	874.03R857.80	20	20	15	natural disturbance (tree/root mold)	n/d
34	873.69R856.93	42	34	11	natural disturbance (tree/root mold)	n/d
35	872.00R857.92	133	93	8	basin (with posthole)	Late Woodland period Ashe Ferry phase
36	872.17R855.55	n/d	n/d	31	natural disturbance (tree/root mold)	n/d
37	872.66R855.45	40	40	10	natural disturbance (tree/root mold)	n/d
38	869.35R857.07	85	70	6	natural disturbance (tree/root mold)	n/d
39	871.24R856.55	80	55	17	natural disturbance (tree/root mold)	n/d
40	871.45R859.05	145	103	10	basin (with posthole)	Late Woodland period Ashe Ferry phase
41	772.91R929.14	84	65	17	basin	Mississippian period Early Brown phase
42	872.74R857.09	100	80	8	basin	Late Woodland period Ashe Ferry phase

Table 4.1. Discrete archaeological features designated at 38YK533.

Feature	Location	length (cm)	width (cm)	depth (cm)	formal description (functional interpretation)	temporal period cultural phase
43	855.50R905.00	165	145	60	pit (probable storage/processing facility repurposed as grave)	Late Woodland period Ashe Ferry phase
44	840.28R905.83	80	65	20	basin	Late Woodland period Ashe Ferry phase
45	839.60R904.26	105	83	14	basin (grave)	Late Woodland period Ashe Ferry phase
46	847.48R910.50	165	165	25	basin (roasting facility)	Late Woodland period Ashe Ferry phase wi/Early Brown phase zone
47	830.51R909.47	87	75	10	fire-cracked rock concentration (roasting facility)	Late Woodland period Ashe Ferry phase
48	852.12R905.03	100	87	50	pit (storage/processing facility)	Late Woodland period Ashe Ferry phase
49	829.35R909.63	105	90	18	basin	Late Woodland period Ashe Ferry phase
50	841.58R911.87	200	150	22	basin (hearth)	Late Woodland period Ashe Ferry phase
51	848.25R908.90	75	30	15	fire-cracked rock concentration (roasting facility)	Late Woodland period Ashe Ferry phase
52	844.20R855.30	180	140	48	pit (storage/processing facility)	Late Woodland period Ashe Ferry phase
53	840.92R907.74	123	100	15	fire-cracked rock concentration (roasting facility)	Mississippian period Early Brown phase
54	847.85R905.44	35	35	19	natural disturbance (tree/root mold)	n/d
55	846.52R905.32	50	50	6	fire-cracked rock concentration (roasting facility)	not determined
56	844.91R907.03	40	40	50	pit (posthole?)	Late Woodland period Ashe Ferry phase
57	842.71R906.73	45	45	35	pit (posthole?)	Late Woodland period Ashe Ferry phase
58	840.03R908.49	70	29	5	artifact cluster	Middle Woodland period Deptford phase
59	834.46R904.37	55	43	18	basin	Late Woodland period Ashe Ferry phase
60	840.27R901.86	50	40	40	pit (posthole?)	Late Woodland period Ashe Ferry phase
61	826.11R923.00	171	132	14	basin (with postholes)	Late Woodland period Ashe Ferry phase
61a1		25	25	50	posthole	Late Woodland period Ashe Ferry phase

Table 4.1. Discrete archaeological features designated at 38YK533.

Feature	Location	length (cm)	width (cm)	depth (cm)	formal description (functional interpretation)	temporal period cultural phase
61a2		23	20	37	posthole	Late Woodland period Ashe Ferry phase
62	838.35R901.80	85	73	n/d	pit (grave)	Late Woodland period Ashe Ferry phase
63	832.62R904.87	60	45	50	pit (posthole?)	not determined
64	840.85R899.45	20	20	11	natural disturbance (tree/root mold)	n/d
65	850.49R853.84	120	100	45	pit (storage/processing facility)	Late Woodland period Ashe Ferry phase
66	847.26R854.09	125	105	21	basin	Late Woodland period Ashe Ferry phase
67	837.83R905.86	115	90	15	basin	Late Woodland period Ashe Ferry phase
68	837.38R910.65	40	35	12	natural disturbance (tree/root mold)	n/d
69	844.21R906.24	52	40	38	pit	Late Woodland period Ashe Ferry phase
70	843.25R911.32	50	40	27	natural disturbance (tree/root mold)	n/d
71	843.38R910.25	35	30	37	natural disturbance (tree/root mold)	n/d
72	849.16R851.37	120	80	13	basin	Late Woodland period Ashe Ferry phase
73	840.66R895.35	75	50	40	pit	Late Woodland period Ashe Ferry phase
74	847.51R858.44	90	90	15	basin with fire-cracked rock concentration	Mississippian period Early Brown phase
75	827.46R923.36	25	25	9	pit / artifact cluster	Late Woodland period Ashe Ferry phase
76	850.67R850.45	260	200	80	pit (storage/processing facility)	Late Woodland period Ashe Ferry phase wi/Early Brown phase zone
77	850.22R860.02	120	120	16	fire-cracked rock concentration (roasting facility)	Late Woodland period Ashe Ferry phase
78	837.60R869.62	100	70	13	fire-cracked rock filled pit (roasting facility)	Mississippian period Early Brown phase
79	837.82R869.89	60	47	20	pit	Mississippian period Early Brown phase
80	843.74R850.53	15	15	2	artifact cache	Late Archaic period Savannah River phase
81	749.40R955.60	n/d	n/d	n/d	pit	not determined

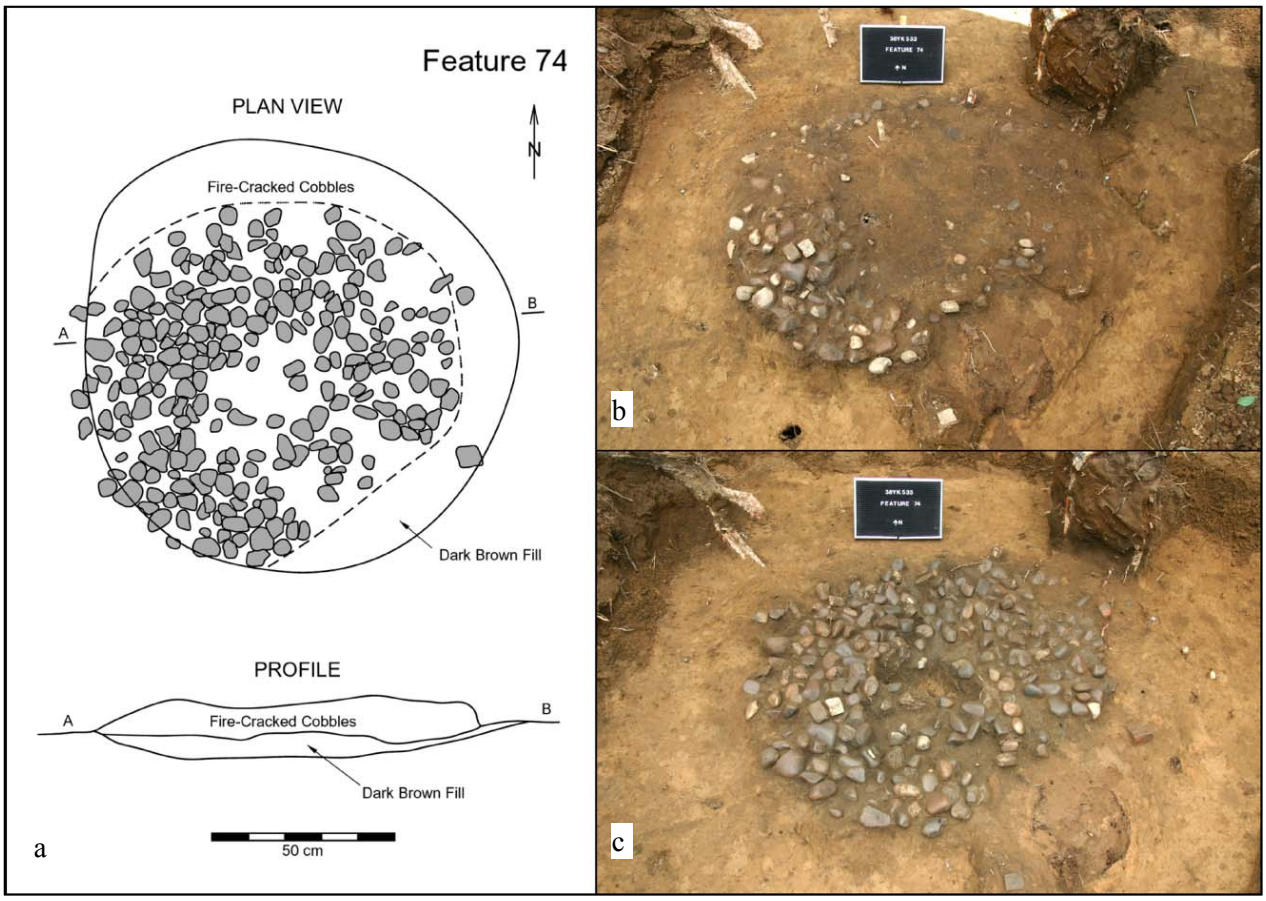

Figure 4.4. Illustrations of Feature 74, a rock-filled roasting facility. a: plan view and profile drawings; b: top of feature prior to excavation, c: top of feature with fire-cracked rocks fully exposed.

linings relatively intact. Repeated reuse of these facilities caused progressive deterioration of the facilities and the constituent rocks. Archaeological evidence for "rock oven" or heated-stone griddle cooking facilities is well documented in Archaic and Woodland period contexts throughout the southeast, and similar facilities are widely distributed across North America wherever suitable stones are available (Petraglia 2002, Wandsnider 1997).

Burned rock features are associated with both the Ashe Ferry phase and Early Brown phase occupations at Ashe Ferry; AMS assays of materials from two rock hearths yielded calibrated intercept dates of A.D. 1010 and A.D. 1270. Most of these facilities are located along the western edge of the site in proximity to large pit features; the co-distribution of these pits and hearth facilities may represent a spatially segregated activities precinct. Rock hearths at Ashe Ferry range from 50cm to 190cm in diameter and five to 15 cm in thickness, and typically include bedded masses of small (5-10cm) river cobbles (primarily quartzite and quartz). In many cases, fired cobbles appear to be dispersed from their original (typically circular) concentrations. Some of this dispersion is post-depositional (due to plowing), but some cobbles may also have been dislodged by manipulation or removal of the primary cooked or heated content. Some of these features exhibit margins defined by *in situ* fired cobbles, but the interior cobbles are sparse, perhaps as a function of hearth cleaning

All of these features appear to be the basal remnants of shallow facilities dug through the original A-horizon soils (approximately 20cm) and which barely penetrated the subplowzone E-

horizon; all of these features are plow truncated, and many similar facilities may have been completely obliterated by pre-1916 site cultivation. Most of these rock clusters are surrounded by halos of charcoal infused soils, the post-depositional products of leaching of ash and charcoal residues from fires burned atop the beds of river cobbles.

Most of the cobbles in the rock hearths are reddened or discolored due to *in situ* firing, but relatively few are actually cracked or particularly degraded by firing. The unbroken, but discolored condition of the fired cobbles is consistent with relatively slow heating to high temperatures, and maintenance of dry firing environments (i.e., no introduction of water for steam) through the cooling stage to hold thermal stress fracturing to a minimum (see Jackson 1998). The shallow depth of most of these rock hearth facilities and the condition of the constituent cobbles is consistent with a hearth type that Thoms (2007, 2008, 2009) and others have associated with hot rock dry griddling or grilling at or near the ground surface. In these applications, fired cobble beds provided thermal mass for retention of heat after fuel combustion above the rocks subsided, allowing efficient regulation of heat for close-order cooking on heated cobbles without potentially dangerous flames. By contrast, Feature 78 consists of a bed of cobbles positioned in a well-defined pit, with masses of charcoal preserved beneath the cobble layer indicative of heating of stones above the combustion zone.

Relatively intact, coherent fired-rock arrays illustrate two distinct size grades of rock hearths. Small hearths (Features 13 and 55) consist of relatively few (7-25), closely-packed cobbles. These probably represent facilities constructed for relatively small-scale, discrete cooking or drying tasks (e.g., roasting or drying meat or fish in small quantities). More common are large burned-cobble beds ranging 87cm–120cm in diameter, with single or double layers of stones forming uniform surfaces. These heated cobble surfaces (and associated beds of hot ashes and embers) presented griddle-like platforms for rapid, uniform dry heating or cooking of larger quantities of foods. Foods suitable for this type of processing or preparation were likely small or thin enough to cook thoroughly over a relatively brief period, but were not amenable to open flame cookery. Smith (2000) and Thoms (2008, 2009) note that such large rock griddles were often used for drying of meats, where steady moderate heat without flame aided desiccation without scorching.

Botanical samples from rock hearths at Ashe Ferry (see Peles and Scarry, this volume) may offer clues to the specific functions of these facilities. The suites of plant remains recovered from rock hearths include acorn nutshell and nutmeats, chestnut shell, hickorynut shell, maize, maygrass, purslane, bearsfoot and spurge, but are heavily dominated by acorn nutshell (which account for 95% of identified specimens in rock hearths). By contrast, plant remains recovered from large storage pits at 38YK533 are heavily weighted toward hickorynut shell and acorn nutmeats; acorn nutshell accounts for 15% of identified specimens from these contexts. The prevalence and ubiquity of acorn fragments at 38YK533 indicates that acorn processing—which yielded charred shell and discarded nutmeats as byproducts—was a major activity during the Late Woodland and Early Mississippian periods at Ashe Ferry. The disparate representation of acorn nutshell in rock hearth contexts at 38YK533 may reflect *de facto* residue of the roasting or parching of acorns in these facilities. Parching of acorns to prevent germination and kill insect larvae is well documented in the ethnographic and ethnohistorical records (Converse 1908, Densmore 1928, Harriot 2007[1590], Heath 1963; Lederer 1672; Lawson 1709; Ortiz 1991; Petrusco and Wickens 1984; Smith 1923; Tantaquidgeon 1972). In the Iroquois legend of *De-wan-do* and the Flying Head, *De-wan-do* "…was at the hearth fire <u>roasting acorns</u> … One by one as they <u>burst their shells</u> she drew them away… [emphasis added] (Converse 1908:81)." The

signature popping or bursting of the hulls of roasted acorns due to the rapid escape of steam undoubtedly introduced acorn shell fragments into hearths and the surrounding areas. Harriot (1590) indicates that natives on the Carolina coast roasted acorns on cane hurtles over fires as a first step in processing (Hariot 2007 [1590]). *Mourt's Relation* (1622), reports that the Plimoth colonists "… found two baskets full of parched acorns hid in the ground" by Wampanoag natives (Heathy 1963: 34). Lederer (1672:15) observed that the Eno people (of the North Carolina piedmont) "parch their Nuts and Acorns over the fire, to take away their rank Oyliness." Smith (1923) notes that among the Wisconsin Menominees, acorn

> …. hulls were flailed off after parching, and the acorn was boiled till almost cooked. The water was then thrown away. Then to fresh water, two cups of wood ashes were added. The acorns were put into a net and were pulled out of the water after boiling in this. The third time, they are simmered to clear them of lye water. Then they are ground into meal with mortar and pestle, then sifted… [emphasis added] (Smith (1923:66)

While it is likely that rock hearths at Ashe Ferry served a variety of cooking and drying functions in which indirect heating was useful, the frequency, distribution, and content of these facilities may reflect an emphasis on specialized food processing (e.g., acorn roasting). Other types of facilities at Ashe Ferry have yielded unusual quantities of discarded acorns and peeled acorn nutmeats, and it appears that gathering, processing, and storage of acorns were particularly prominent activities at Ashe Ferry during the Late Woodland and early Mississippian periods. Repeated construction and use of rock hearths, the dominant feature type at Ashe Ferry, over a 200-year span, suggests long-term stability in site function linked to a concentrated, locally available resource that required hot rock griddling or dry roasting for preparation or preservation.

Storage pits (n=8)

Eight large pit features (Features 11, 20, 28, 43, 48, 52, 65, and 76) are provisionally categorized as storage facilities designed for retention of foodstuffs or caching of goods (Table 4.1; Appendix B; Figures 4.5, and 4.6). All are associated with the Late Woodland period Ashe Ferry phase component; associated AMS dates indicate storage pits spanning ca. A.D. 1010–1160. These round or ovoid storage facilities are distinguished by large volumes (.4 m^3–6.5m^3) and high depth/diameter ratios (.3–.5). Most of these pits exhibit flat (level or slightly inclined) or slightly concave bases, with distinct inflections that mark base-wall junctures. Pit diameters range from 100cm to 280cm, with depths that range from 45cm to 105cm (below plowzone). With the exception of Feature 48, the smallest probable storage pit, these facilities are located along the west (landward) side of the river terrace, where slightly finer grained sediments may have been more conducive to large pit construction and maintenance. Nonetheless, all of these facilities have outsloping sidewalls rather than the vertical (or bell-shaped) walls optimal for storage facilities (cf. DeBoer 1988); this wall morphology is likely the product of rapid pit deterioration in the highly friable site matrix. Successful use of storage pits at Ashe Ferry probably required wall buffers (e.g., bark linings, basketry) to prevent soil infiltration, and removal or deterioration of such buffers likely occasioned pit wall collapse. Reuse of these pits probably required substantial reconstruction, a factor which may account for pit asymmetries and evidence of pit expansion.

These large, deep pits tend to exhibit greater stratigraphic complexity than other features at 38YK533, and most include multiple strata indicative of incremental filling processes. In at least one instance (Feature 76), stratigraphic complexity is compounded by a later (Early Mississippian period) pit intrusion directly into earlier (Late Woodland period) pit deposits. In

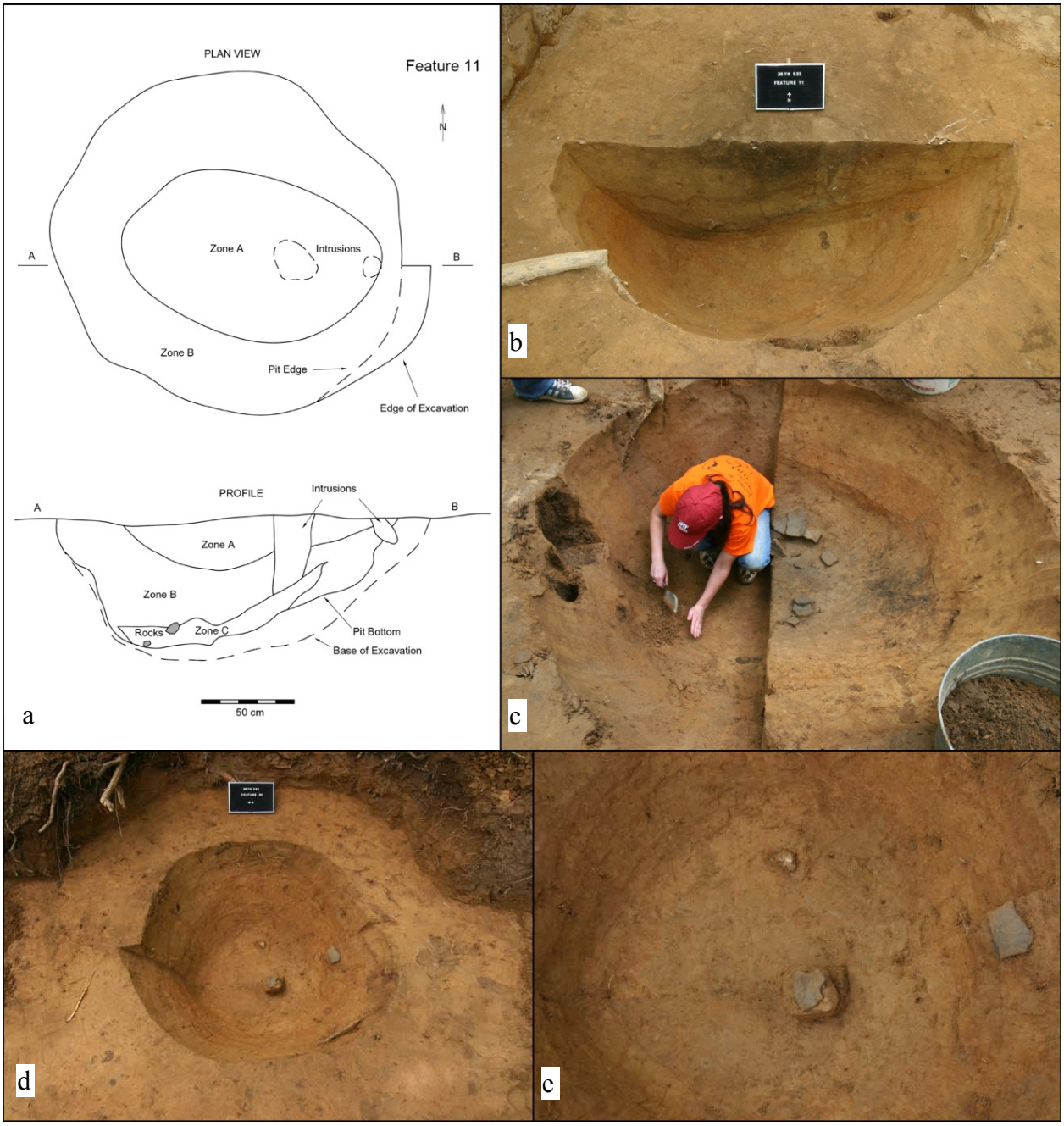

Figure 4.5. Illustrations of Feature 11, a probable Ashe Ferry phase storage/processing pit. a: plan view and profile view drawings; b: fill profile with south half excavated (view to north); c: cleaning for photograph (view to west); d: fully excavated feature (view to north); e: *in situ* potsherds resting on top of Zone C (view to north).

addition, developmental lamellae formed incipient horizons across much of the site; these crosscut deposits in deep pits, indicating lamellae development during the last millennium. Deep pit contexts also yielded greater frequencies of refuse and more diverse artifact assemblages than other feature contexts at 38YK533; this pattern appears to be a direct function of total

feature volume, and the absolute density of artifacts per unit volume is more randomly distributed among feature types.

Most of the large capacity pits at the Ashe Ferry site received habitation refuse after their presumed abandonment as storage/processing facilities. Some of this refuse was likely coincident with soils dumped or collapsed into the pits, but instances of conjoining ceramic vessel sections in pits presumably connote direct, primary refuse disposal in storage pits as well. In one instance (Feature 43), a probable storage facility (as identified by pit morphology) appears to have been laterally cycled and reused as a grave. In another case (Feature 11), fragmented human remains appear to have been incorporated in pit fill coincident to backfilling; these remains likely derived from an earlier context that was disturbed, but unrecognized, by Late Woodland period site inhabitants.

Large capacity subterranean pits, such as those documented at 38YK533, are generally considered to represent facilities for mass storage or caching of foodstuffs to preserve, or, in some cases, process foods for later consumption (Arnold 1995, DeBoer 1988; Dickens 1985; Mathews 2009). In settings where horticultural or agricultural food production is prominent, it is typically assumed that such facilities are directly related to storage of produce, and large numbers or high densities of pit facilities have been interpreted as evidence of surplus horticultural production (Ames, et al., 2009; DeBoer 1988; Dickens 1985; Wesson 1999).

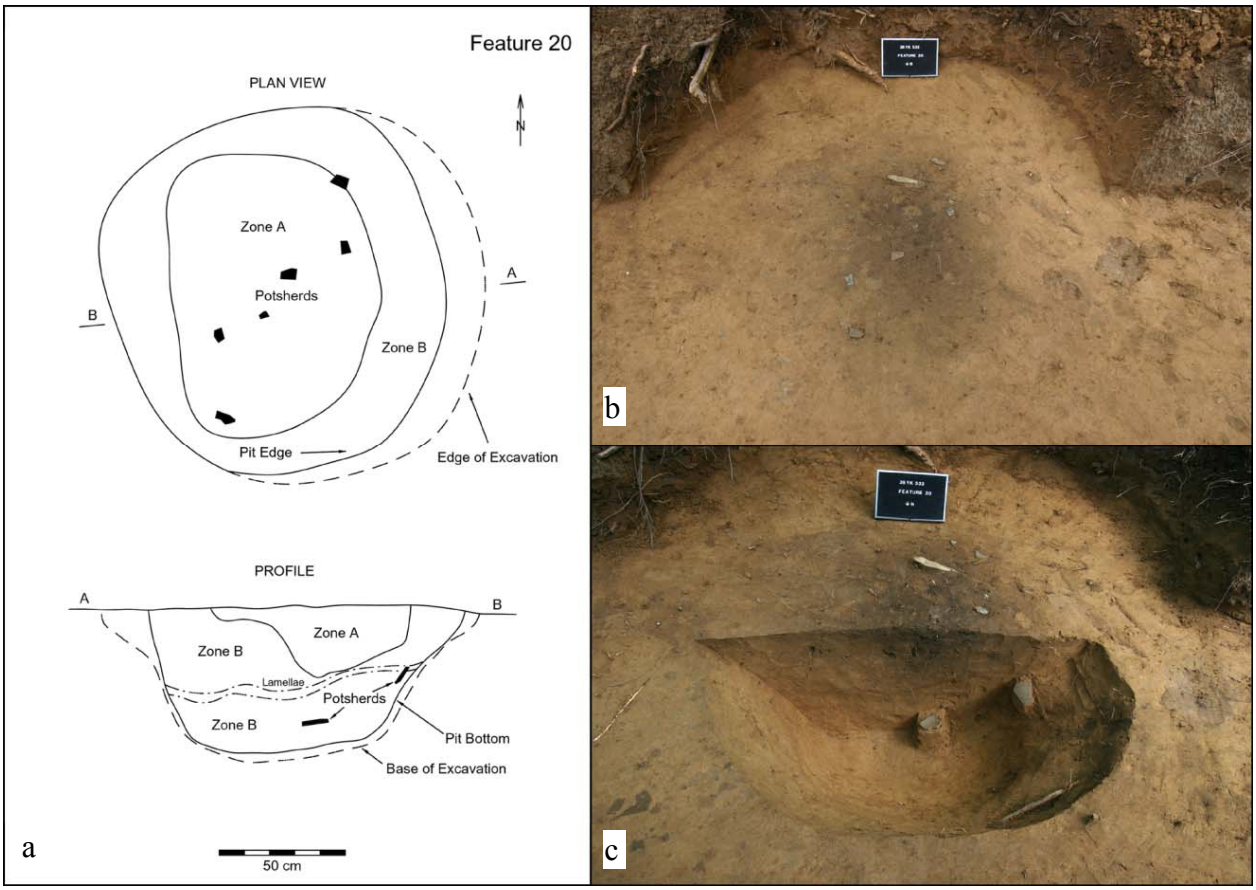

Figure 4.6. Illustrations of Feature 20, a probable Ashe Ferry phase storage/processing pit. Feature 20 a: plan view and profile view drawings, b: top of feature (view to south), c: fill profile with north half excavated (view to south).

In the case of the Late Woodland period Ashe Ferry phase component, in which there is limited evidence for horticulture, such pits likely contained wild plant foods gathered from the surrounding environment. Unfortunately, pit fills at Ashe Ferry comprise primary or secondary refuse, and the original stored content can only be inferred. In the moist, subtropical climate of the southeastern piedmont, pit storage is best suited to vegetable materials with moderate moisture content (e.g., tubers) that require cool, stable temperatures, and substantial relative humidity for long term preservation (on the order of months, not years). Edible wild tubers available in quantity to the inhabitants of the Ashe Ferry site likely included *Apios americana* (groundnut), *Peltandra virginica* (tuckahoe), and *Smilax rotundifolia* (greenbriar), but these highly perishable foods are unattested by the paleoethnobotanical record (see Chapter 7). By contrast, botanical samples from Ashe Ferry present ubiquitous evidence for processing of acorns, with pit features that contained substantial numbers of discarded charred nutmeats, and rock oven facilities that yielded appreciable quantities of charred acorn shell. It is hypothesized that gathering and processing of acorns was a major economic focus at the site during the Late Woodland period, and the large capacity subterranean pits at Ashe Ferry may represent facilities related to mass storage or processing of acorns. Although the highly permeable soils at Ashe Ferry do not present an optimal matrix for pit construction or maintenance, they drain readily, and could facilitate subterranean storage of acorns or acorn nutmeats without saturation. Because the sandy matrix of the site allowed rapid percolation of rainwater, snowmelt or floodwater, subterranean storage of acorns at Ashe Ferry might also have promoted the passive flushing of tannins from acorn nutmeats, a process that would render normally bitter and acidic red oak acorns more palatable and useable. Subterranean caching of acorns to flush tannins is well documented among California natives (Gifford 1936, Moerman 2002), and peoples of coastal Oregon and Washington (Gunther 1973, Harper 1971, Mathews 2009, Moerman 2002). Densmore (1924:320) notes that among the Ojibwe, "Sweet acorns (*mitigo′ minum*) were frequently gathered in the late fall and buried for use in the winter or spring ...." Bradford (1622) "… found two baskets full of parched acorns hid in the ground" by Wampanoag natives in present-day Massachusetts (Heathy 1963: 34).

The general spatial coincidence (and contemporaneity) of large capacity pits and rock hearth roasting facilities along the western side of the site may also hint at their functional association as components of a single food processing/storage complex. Given the predominance of acorn remains in botanical samples at 38YK533, and the weight of ethnographic and ethnohistoric evidence for acorn parching and acorn storage/leaching in subterranean pits, it appears most parsimonious to associate both the roasting and storage facilities at 38YK533 with acorn processing and storage activities. Clearly, other specific functions for these large capacity pits are equally plausible, but none are specifically supported by archaeological evidence.

Shallow basins (n=16)

Shallow basin-shaped pits or depressions (Features 1, 16, 19, 22, 32, 35, 40, 42, 44, 46, 49, 50, 58, 61, 66, 67, 72 and 79) comprise multiple functional types, including probable hearths, basins with postholes, and probable short term storages facilities (Table 4.1; Figures 4.7–4.9). These broad, basin-shaped depressions typically appeared as indistinct, roughly oval patches of organic staining of the subplowzone surface. Because leaching of organic soil content obscured the margins of these features, it was often difficult to distinguish the original feature morphology, and, in some cases, these "basins" might actually represent halos of organic staining that emanated from features otherwise obliterated by historic plowing.

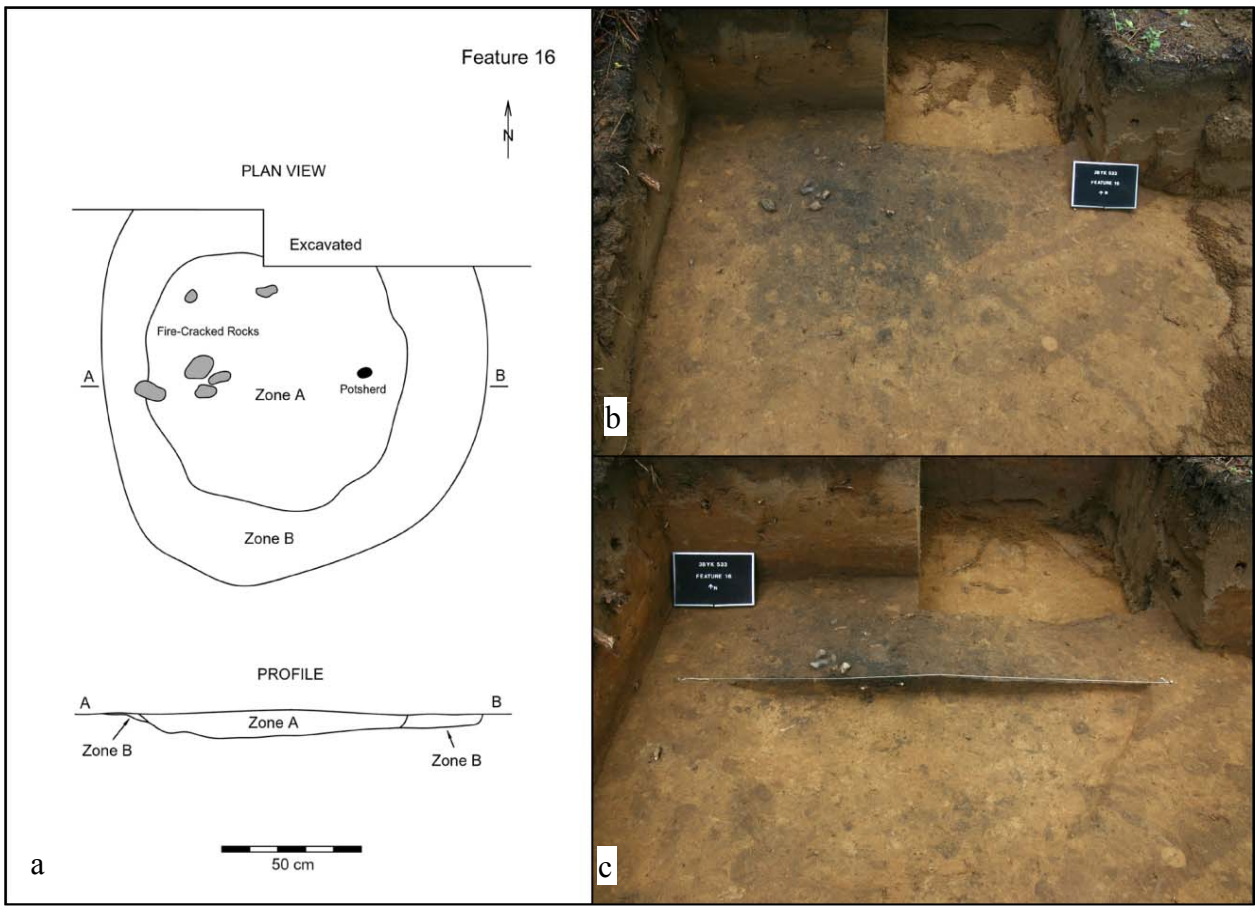

Figure 4.7. Feature 16, a shallow basin that probably represents the basal remnant of a plow truncated roasting facility. a: plan view and profile view drawings; b: top of feature (view to north); c: fill profile with south half excavated (view to north)

Four of these basins or shallow pits (Features 32, 41, 66, and 79) evinced relatively clearly defined margins and bases indicative of construction by excavation. All are relatively large (72-125 cm dia.) but shallow (11-21cm below base of plowzone) facilities that were probably not suited to long term subterranean food storage (lacking both sufficient depth and volume). These pits may have functioned for shorter term caches, or as processing facilities, but neither the content nor morphologies of these features provide clues to their functions.

Other shallow, basin-shaped features (Features 16, 19, 22, 44, 46, 67) closely resembled the basal levels of burned rock-filled roasting facilities, and may reflect staining from the leaching of ash and charcoal infiltrated soils below the actual heating surfaces. Feature 22, a large (220cm x 160cm), shallow basin or depression with burned earth and abundant charcoal inclusions, yielded high counts of acorn nutshell comparable to rock hearths, and probably represents a roasting area where nuts were parched in ashes and embers without a rock surface. Features 16, 19, 46, and 67 also appear to represent the basal levels of roasting facilities, and exhibit sparse inclusions of fire-altered cobbles.

Feature 50, a shallow basin with complex internal structure, may represent another specialized hearth construction (Figure 4.7). This basin includes two smaller circular "subpits," (Zones A and B) which probably represent the original intrusions into the subplowzone surface. Zone A included large slabs of an Ashe Ferry series ceramic vessel that bounded walls of the

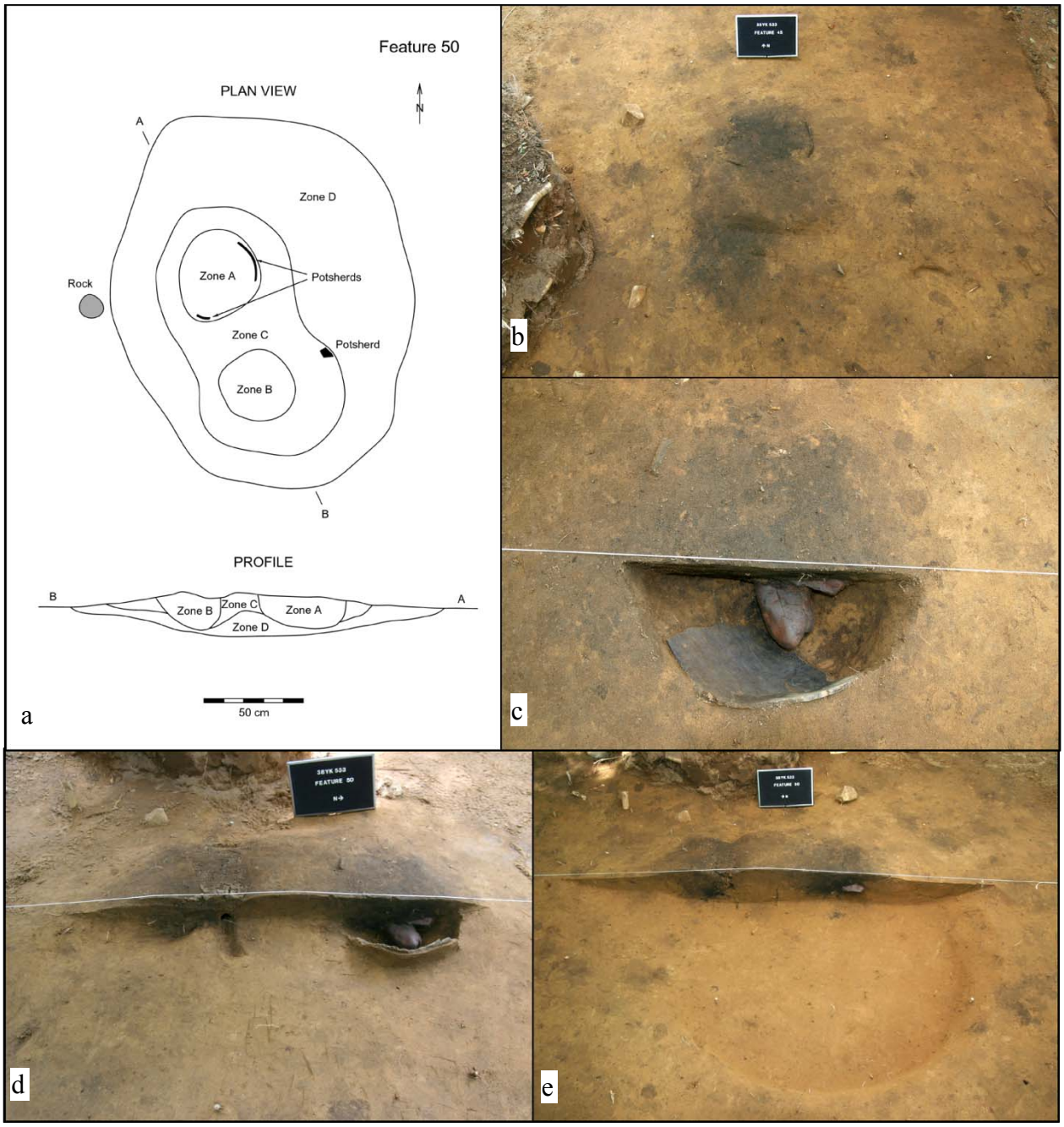

Figure 4.8. Feature 50, a shallow basin with "subpits" including *in situ* vessel fragments. a: plan view and profile view drawings; b: top of feature (view to north); c: intrusive pit (designated Zone A) containing large vessel section with northeast half excavated (view to southwest); d: fill profile before removing Zone A potsherds with northeast half excavated (view to southwest); e: fill profile with northeast half fully excavated (view to southwest).

small pit; these *in situ* slabs likely represent fragments of a vessel used and broken within the pit and partially retrieved. The base of Zone B, a nearly identical intrusion centered 32cm from Zone A, exhibited a dense deposit of charcoal with structure indicative of *in situ* firing. Both of these small pits may have been constructed to seat dual ceramic vessels over coals for cooking or

other food processing. For instance, Smith (1923) implies the simultaneous use of multiple vessels for the process of alkali leaching of acorn tannins by Menominee cooks.

Surrounding Zones A and B was an oval band of soil with heavy carbon staining (Zone C), which graded into Zone D, the "shallow basin." Both Zones C and D were likely the products of leaching of carbon from Zones A and B (which probably filled with ashes and charcoal upon removal of the ceramic vessels).

Other shallow basins (Features 35, 40, and 61) include one or more postholes, and may represent excavations to provide deeper footings for post placements. Feature 61, a broad shallow basin, included two deep, rounded based postholes located 12 cm apart (Figure 4.8). These paired posts, along with a nearby posthole (Feature 75) probably represent a simple Late Woodland period construction frame for a rack or shed. No other postholes or other discrete context are documented in the immediate vicinity. Features 35 and 40 are adjacent shallow basins that each include small (28-30cm) shallow, circular flat based pits that resemble postholes in form and diameter. These features may represent a construction comparable to the Feature 61-Feature 75 posthole cluster.

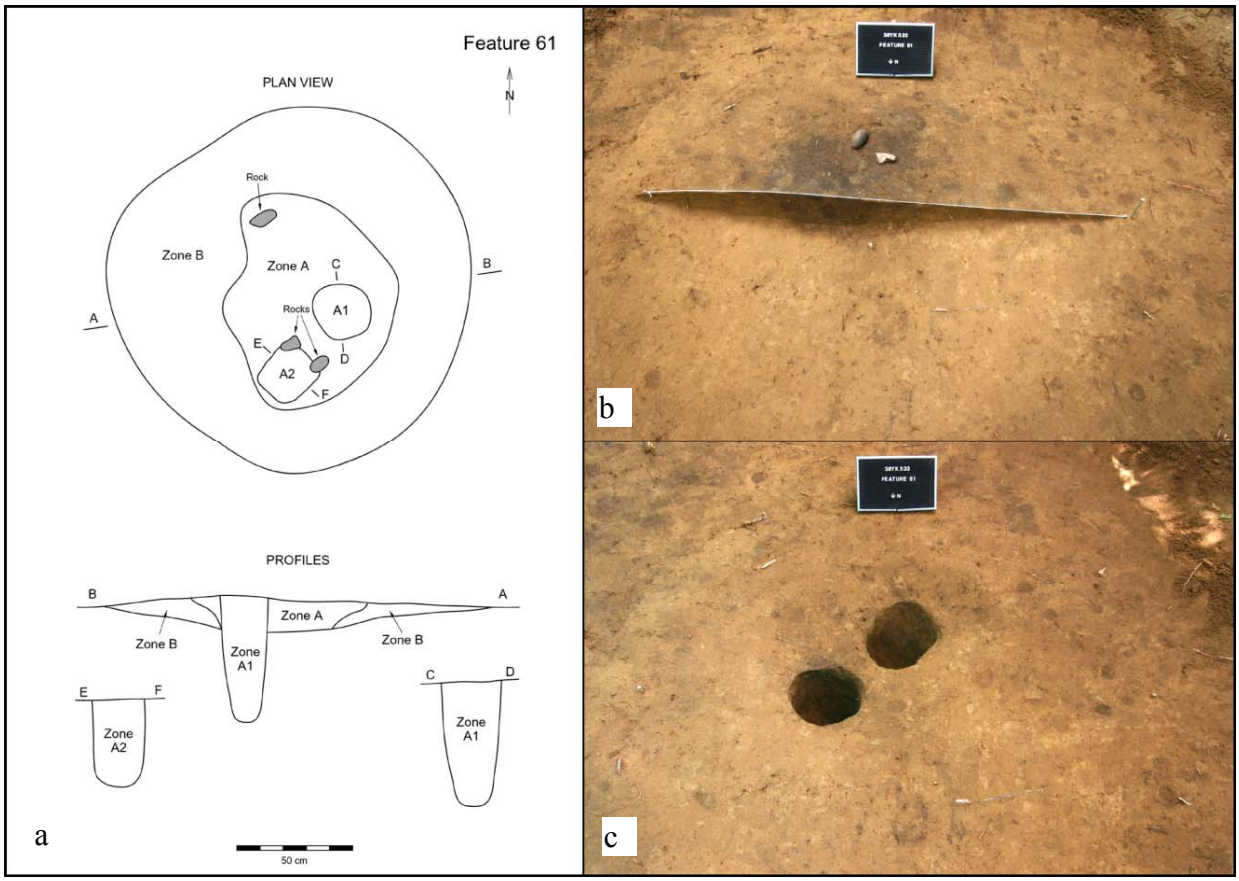

Figure 4.9. Feature 61, a shallow basin with postholes. a) plan view and profile view drawings; b: fill profile with north half excavated (view to south); c: base of feature with excavated postholes (bottom right, view to south).

Still other shallow basins (Features 1, 42, 58, and 72) were functionally obscure, amorphous soil lenses that yielded artifacts in densities equal to, or greater than, the overlying plowzone. Feature 1, a thin, irregular lens, contained a substantial portion of a fragmented Woodstock Complicated Stamped jar, but practically no other materials. Feature 58 consisted of three clusters of conjoining Deptford Check Stamped sherds that presumably demarcated a heavily leached shallow basin.

Postholes (n=11)

Eleven small pits (Features 35a, 40a, 56, 57, 60, 61a1, 61a2, 63, 69, 73, and 75) are characterized as probable postholes, excavations for the installation of earthfast wooden posts (Table 4.1; Figures 4.9–4.11). Two of these pits (Feature 61a1, 61a2) exhibit the cylindrical morphology commonly associated with this facility type; the remainder are more conical in form, probably as a result of warpage during post extraction and pit wall collapse. These postholes range in size from 23cm–75cm diameter and 9cm–50cm in depth, and are distinguished by very high depth/diameter ratios (range: .53–2).

Nine of the probable postholes are located along the eastern edge of the site on the front (riverside) edge of the terrace. Six of these occur in a high density area in proximity to three graves, hearths, and shallow basins. This cluster of contexts appears to represent the central locus of residential domestic activities at the site, and the postholes here may indicate the remains of a shelter substructure or installations to support other frameworks. One cluster of three posts (Features 61a1, 61a2, and 75) situated at the eastern edge of the site may represent a small-scale scaffold, as do two postholes (Features 35a, 40a) located near the northern edge of the site. None of these groups of postholes constitute coherent architectural patterns.

As evidenced by the markedly indistinct margins of large pit features, the Ashe Ferry site sediments are highly susceptible to leaching and movement of fine organic particles, and post-depositional taphonomic processes may have completely obscured many postholes and other small facilities. Consequently, the lack of coherent posthole patterns at Ashe Ferry cannot be confidently construed as evidence for the absence of permanent (i.e., non-ephemeral) architecture at 38YK533.

Caches (n=2)

Two tightly defined clusters of lithic tools (Features 75 and 80) represent packages of material apparently cached for later use but never retrieved (Table 4.1; Figures 4.2, 4.11, and 4.12). The earlier of these, Feature 80, is a small (15 cm dia.) cluster of Late Archaic period artifacts situated in a shallow depression at the base of the plow zone (Figure 4.11). The cache included one Savannah River projectile point, three bifaces, four cores, and two flakes. Feature 75, a Late Woodland period cache, consisted of one celt, one biface, one projectile point fragment, seven rhyolite cores, two worked flakes, one fragment of unidentified black mineral pigment, and an antler (11 fragments) that were placed in the top of an apparent posthole (Figure 10).

Caching behavior represented by Features 75 and 80 invokes multiple possible scenarios. These unrecovered caches may reflect hiding of possessions from site co-occupants as a behavior intended to be completely internal and contemporaneous within a particular occupation episode. Alternatively, caching may reflect materials intentionally left onsite between occupations or site visits in anticipation of future need. This scenario implies residential mobility of some or all of the site occupants, and efforts to conceal cached materials suggests apprehension of recovery by

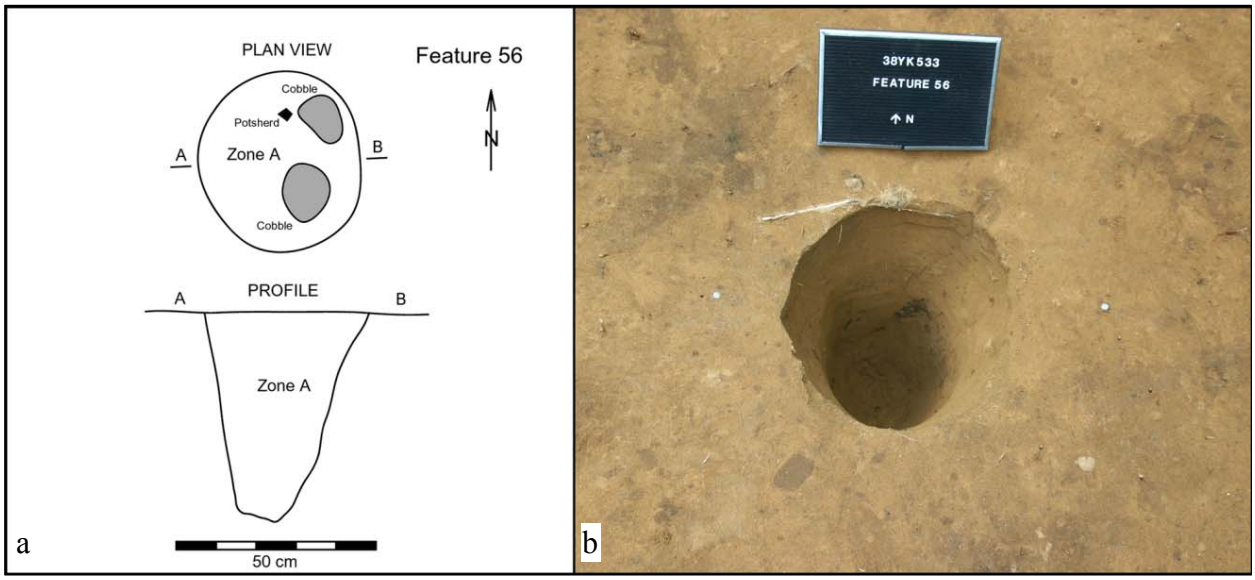

Figure 4.10. Feature 56, a probable posthole. a: plan view and profile view drawings; b:photograph of excavated feature (view to north).

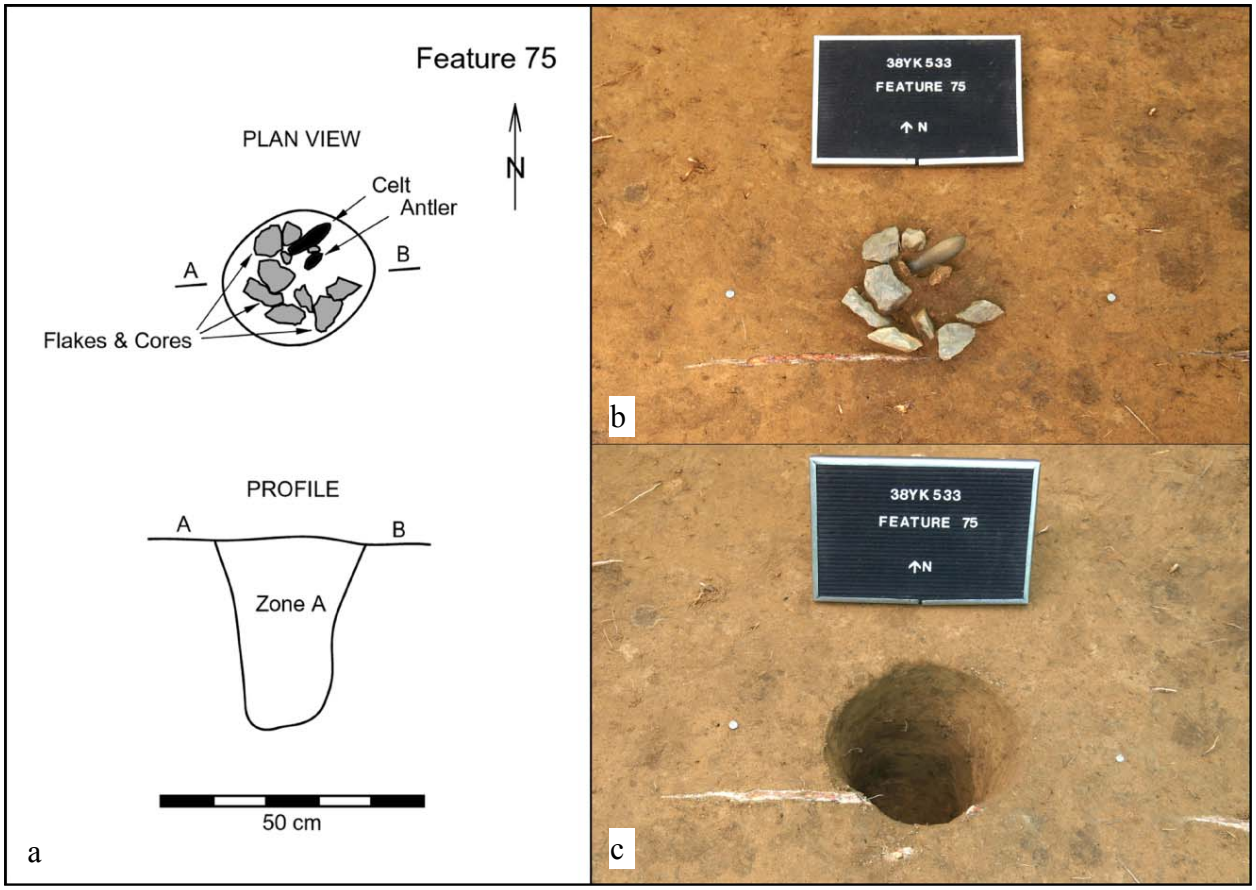

Figure 4.11. Feature 75, a probable posthole with stone-tool cache. a: plan view and profile view drawings; b: top of feature showing *in situ* stone-tool cache (view to north); c: excavated feature (view to north).

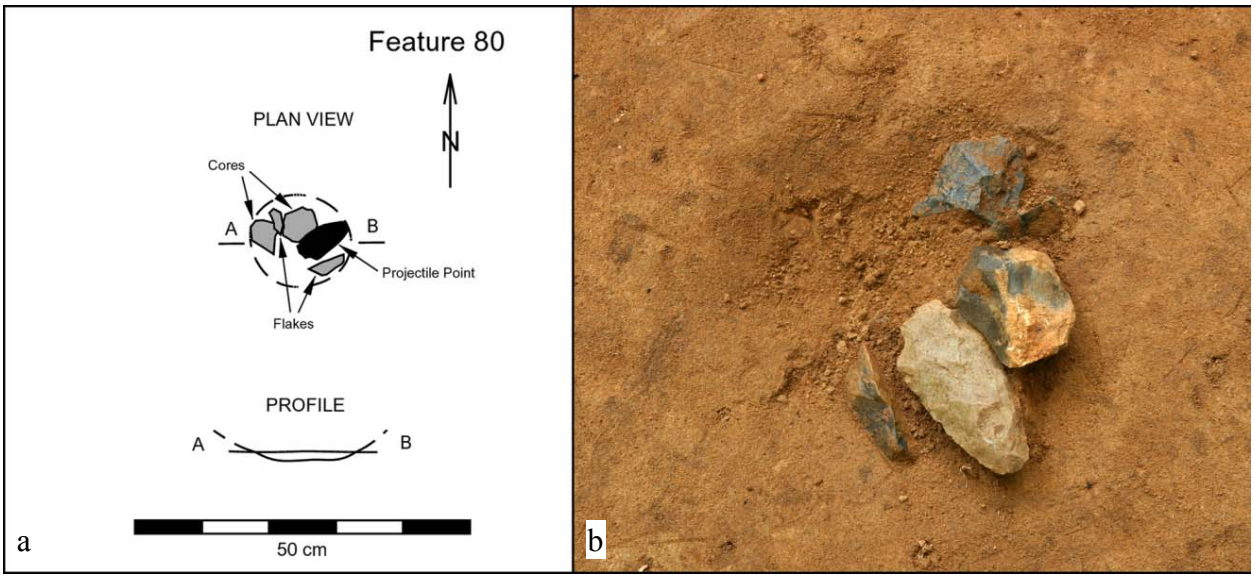

Figure 4.12. Feature 80, a probable Late Archaic period cache. Left: plan and profile drawings; right: plan view photograph (view to west).

someone other than the depositor or their designees. Caching of tools and raw material for tools is a particularly well documented strategy for mobile hunter-gatherer populations with subsistence economies organized in seasonal rounds that occasion predictable revisits to resource rich localities (Binford 1979; Kelly 1985).

Graves (n=3)

Investigations at 38YK533 identified three primary human interments (Features 43, 45, and 62) and discovered fragmentary, disassociated human remains mixed in another pit context (Feature 20) ((Table 4.1; Figures 4.13–4.15). None of these grave contexts could be distinguished by distinctive morphology or matrix characteristics–each presented as diffuse stains of organically enriched soils that were homogenized by post-depositional bioturbation and mechanical leaching. As a consequence, these grave contexts were initially interpreted as domestic facilities (which they substantially resembled) and were treated according to standard investigation protocol. However, upon discovery of human remains in these contexts, investigation was suspended until tribal and agency consultation determined proper treatment and disposition of the graves and their contents. These consultations provided for controlled exhumation and immediate reburial of human remains in a secure location outside the construction corridor. Pursuant to this determination, the three primary burials were relocated, *en bloc*, to a suitable protected location. In addition, the disassociated remains recovered from Feature 20 were reburied at this time.

The three primary inhumations were located on the highest portion of the levee formation along the northeastern flank of the site, part of a high density cluster of discrete contexts with postholes, hearths, and shallow basin-shaped pits that probably represents the primary residential area during the Late Woodland period. Grave associations or materials in the grave matrices indicate that all three primary interments, as well as the disassociated remains recovered from Feature 20, date to the Late Woodland period and are likely associated with the Ashe Ferry phase occupation.

Feature 43, which was located on the eastern edge of the terrace nearest the river, was an probable storage/processing pit that appears to have been repurposed as a grave. This oval pit measured 165 cm x 145 cm, with the inhumation positioned 60cm below the base of plowzone (Figure 4.12). The size and morphology of Feature 43 was directly comparable to large storage or processing pits located along the opposite side of the terrace. Pit matrices comprise two apparent zones, a lower fill that was directly deposited around the inhumation, and an upper zone that probably represents filling of the pit with organically enriched site midden/A horizon soil after (and perhaps in response to) subsidence of the burial fill.

As detailed in Appendix C, *in situ* field analysis of Feature 43 remains indicated that the interred individual was a young adult (est. 20–30 y, based on slightly worn third molar) of unknown sex. Observed skeletal elements included a fragmentary cranium, left mandibular permanent molars (1–3), left maxillary permanent molars (1–3), the neck and distal condyle of a femur, as well as other unidentifiable long bones (see Appendix C). No grave accompaniments were noted, with the possible exception of two teeth and maxillary fragment of a domestic dog. Incidental material recovered from the matrices within Feature 43 included 53 potsherds and nine projectile points referable to the Late Woodland period Ashe Ferry phase components. These inclusions clearly indicate that Feature 43 does not predate the Ashe Ferry phase, but do not preclude the possibility that the inhumation postdates Late Woodland period site occupations.

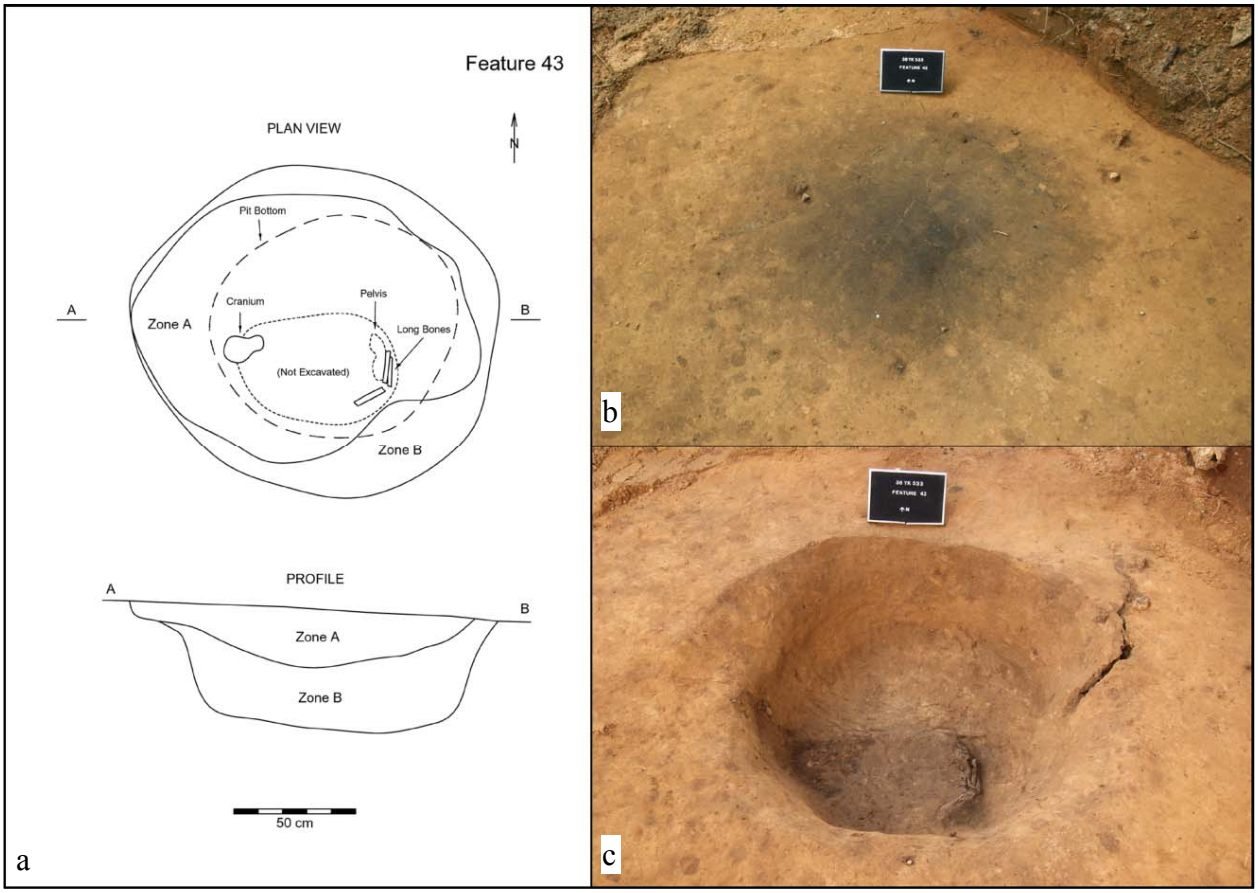

Figure 4.13. Feature 43, a probable storage pit repurposed as human grave. a: plan view and profile view drawings; b: top of feature prior to excavation (view to north); c: Feature 43 following excavation of Zones A and B but before exhumation (bottom, view to north).

Feature 45, which was located approximately 15m south of Feature 43, was a shallow basin-shaped grave pit that contained the remains of a gracile adult male with a small cluster of grave goods (Figure 4.13). The actual grave (Zone A), which measured 117 cm x 78 cm, apparently intruded a larger, preexisting shallow basin (Feature 45, Zone B). The grave pit (Feature 45, Zone A) extended only eight centimeters below the base of plowzone, with human remains evident throughout. Limited exposure of these remains revealed a tightly flexed, north-facing

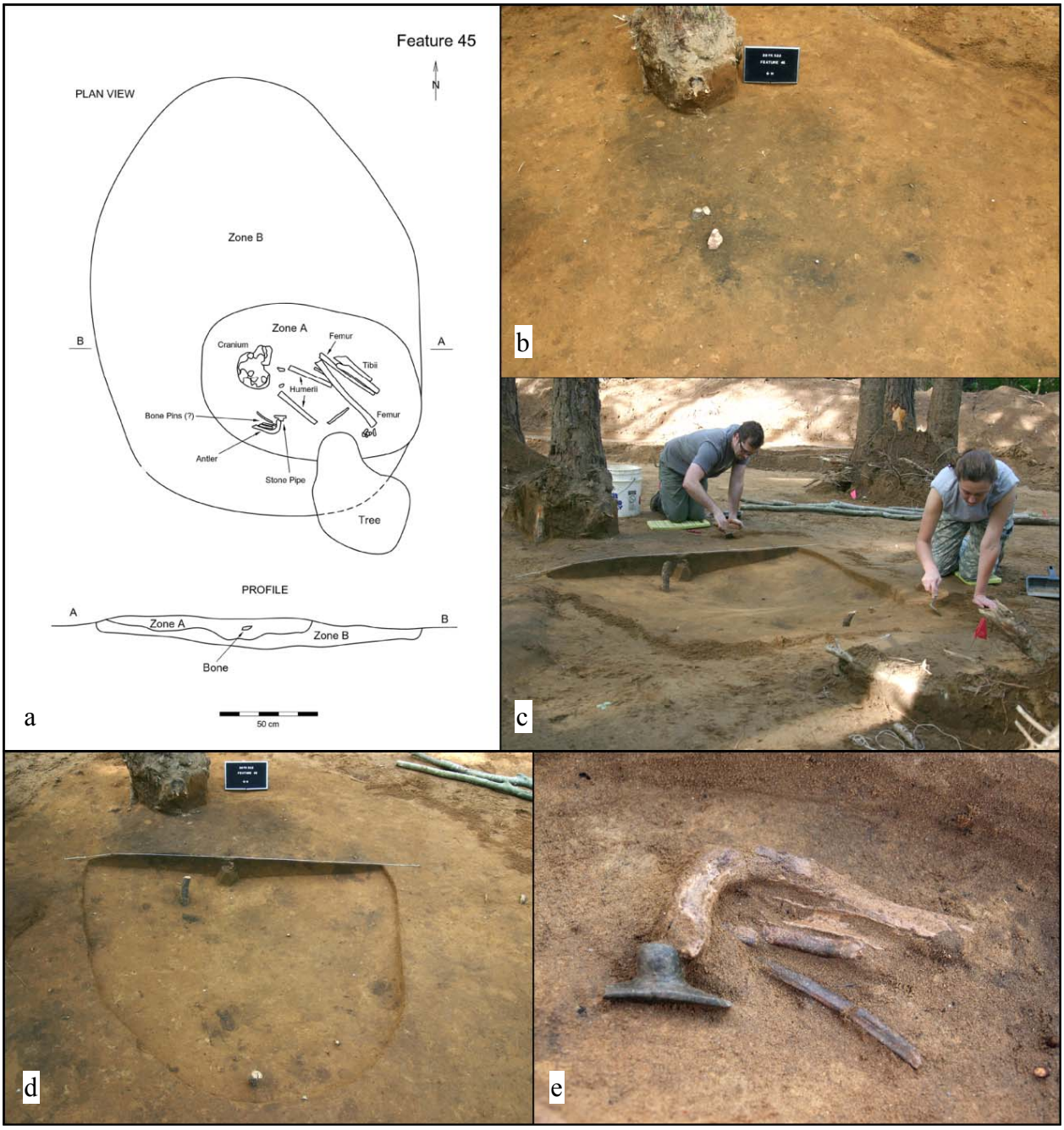

Figure 4.14. Feature 45, a shallow inhumation. a: plan view and profile view drawings; b: top of feature (view to south), c: troweling feature for photography (view to southwest), d: fill profile with north half excavated (view to south); e: cluster of objects (stone platform pipe, deer antler, and worked bone) associated with the burial (view to south).

primary inhumation of a probable adult male; field inventory of the remains noted presence of the cranium, mandible, right side dentition including two worn maxillary molars, one maxillary or mandibular molar, one mandibular molar root, and broken premolar (probably mandibular), along with diaphyses of the right and left clavicles, humerii, ulnae, right radius, femora, and tibiae (Appendix C).

Associated grave goods (Figure 4.13), which were relocated and reburied with the remains, included what appeared to be a small bundle with a chlorite schist monitor-type platform pipe (see Chapt. 6), a deer antler tine, and a fragment of worked and polished bone. The chlorite schist smoking pipe appears directly comparable to presumed Late Woodland period examples recovered from the Town Creek site (Coe 1995). Materials recovered from the matrix of Feature 45 (but not noted in direct association with the burial), include Ashe Ferry phase ceramic sherds. As is the case with Feature 43, these incidental inclusions imply a Late Woodland period *terminus post quem*.

Feature 62, an oval grave pit that included remains of two subadult individuals, was situated 2.5m southwest of Feature 45. The flat-based grave pit measured 85 cm x 73 cm; human remains were evident approximately five centimeters below the base of plowzone. *In situ* field analysis prior to grave relocation indicated that these remains represent: "Two subadult individuals … The remains consisted of two crania that were located adjacent to each other, at least one mandible, and at least one long bone. The dentition of individual one included deciduous maxillary first and second molars (side unknown) and deciduous mandibular first and

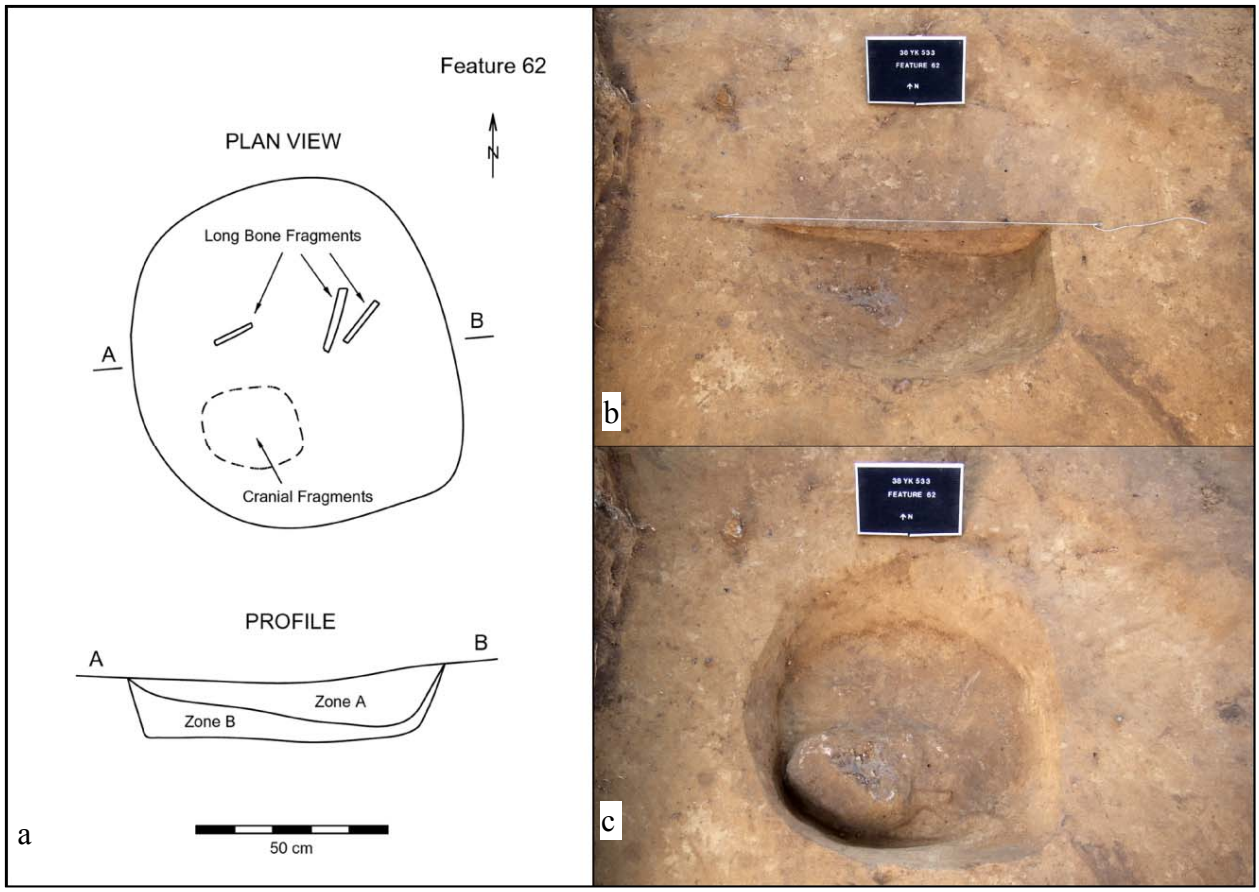

Figure 4.15. Feature 62, an inhumation of two subadult individuals. a: plan view and profile view drawings; b: fill profile with Zone A in south half excavated (view to north); c: feature excavated with the burial partially exposed (view to north).

second molars (side unknown). While these were clearly in articulated position, neither the mandible or maxilla was preserved enough for observation. There was also an unerupted maxillary permanent first molar with only the crown developed. All deciduous teeth were largely unworn. The developmental sequence of the teeth allowed an age estimate of 3–4 years of age (Ubelaker 1999). The dentition of individual two included a left deciduous canine, left maxillary first and second molars, and left deciduous mandibular canine, first and second molars. The mandibular and maxillary molars were clearly articulated in fairly well-preserved bone. There was also an unerupted maxillary permanent left first molar with only the crown developed. All deciduous teeth were largely unworn. The developmental sequence of the teeth allowed an age estimate of 3–4 years of age. There was also a very badly preserved long bone…. The development of the deciduous and permanent teeth indicates these two individuals were of identical or nearly identical ages. No observations were made that would permit assessing whether they were related or not" (Hutchinson, this volume, Appendix C).

No grave accompaniments were evident in the exposed portion of the grave. Incidental materials included in the feature matrix indicate a Late Woodland period Ashe Ferry phase *terminus post quem*.

In addition to the three primary interments, Feature 20 (Zone B) yielded relatively well-preserved human cranial vault fragments and two mandibular molars. While is possible that these remains might represent surviving elements of an *in situ* burial within a preexisting storage pit (as may be the case with Feature 43), these isolated elements may instead reflect accidental redeposition of skeletal remains within the Feature 20 from an unknown original context. No materials observed or recovered from Feature 20 indicated the presence of an *in situ* primary interment.

The occurrence of three primary burials, and a fourth instance of disassociated remains, which together represent five individuals, probably reflect relatively sustained or frequently repeated site occupations consistent with the high densities of occupational debris. All five individuals are referable to Late Woodland period Ashe Ferry phase site occupations, which span approximately 150 years. Clustering of the primary inhumations within a relatively small portion of the total site area suggests that this precinct, on the highest part of the terrace, was deemed the most appropriate locus for interment. This area may correspond to the focus of residential occupation at Ashe Ferry.

Site Structure

The distributions of discrete feature contexts, considered in conjunction with distributions of artifacts recovered from plowzone contexts, reveal multiple patterns in the use of space at Ashe Ferry during the Woodland and Mississippian period occupations. As illustrated by Figure 4.16, ceramic sherds (the most abundant class of artifacts recovered from one meter test units) are broadly, but unevenly distributed across the site. Across most of the site area, one meter square tests yielded 20 or more ceramic sherds each (primarily deriving from buried plowzone or truncated A-horizon deposits). Five general areas revealed much higher sherd densities, with counts of 40–133 sherds/m^2. The northwesternmost cluster, centered around 856R874, forms an arc that includes Features 32, 35, and 42, all of which are attributed to Ashe Ferry phase occupations (Figure 4.16). Exceptionally high sherd weights (1988g/m^2) centered at unit 873R856 reflect the incidence of a nearly complete, reconstructable fabric impressed vessel (Figures 3.23 and 5.18) recovered from the plowzone and A-horizon remnant. The distribution of fire-cracked rocks (as measured in g/m^2) in this area mirrors that of potsherds, indicating heavy

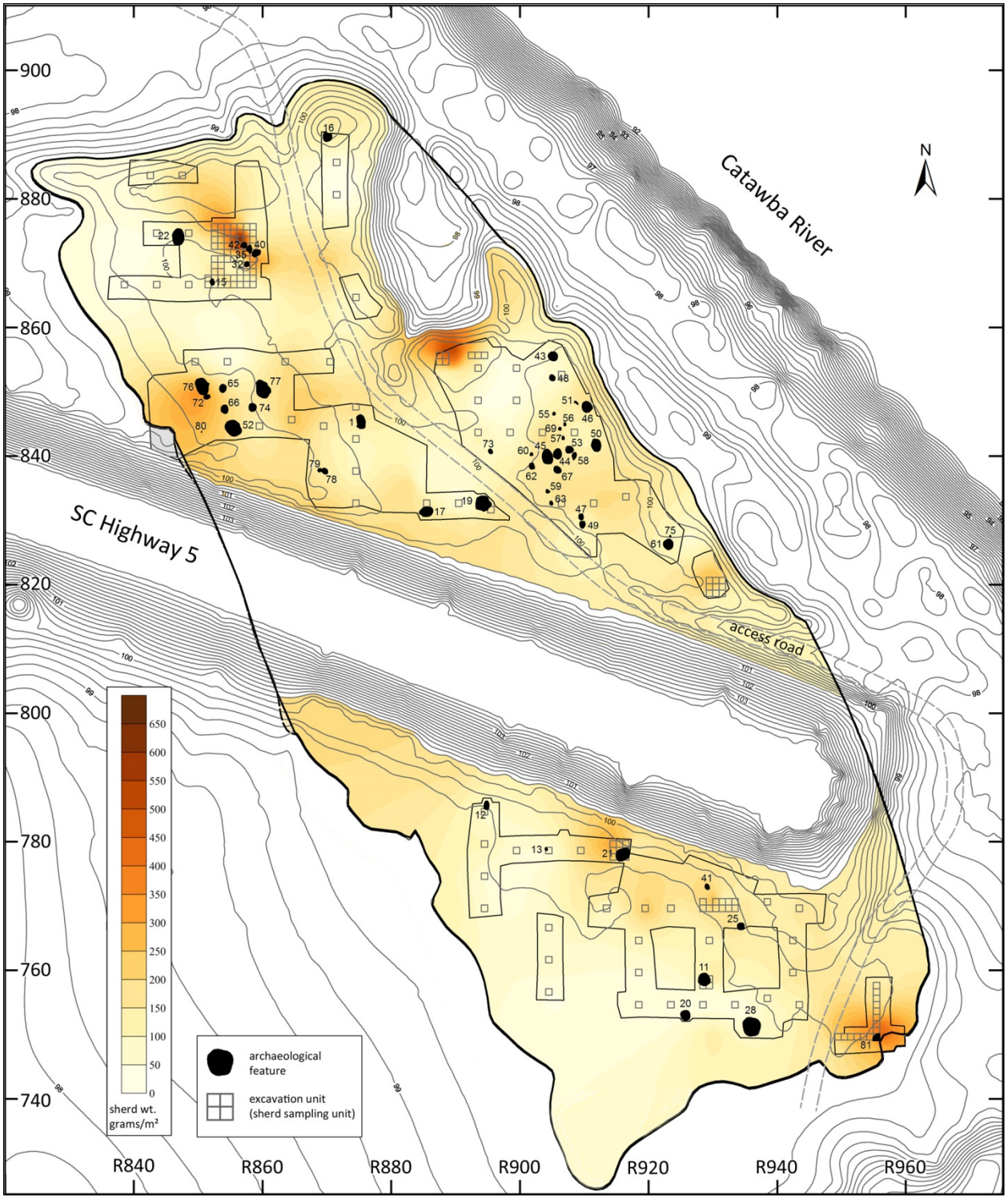

Figure 4.16. Ceramic sherd density (grams wt. sherds/m²) (extrapolated from one-meter tests) at 38YK533.

concentration of refuse around Features 32, 35, and 42, with a lower density concentration or refuse evident adjacent to nearby Feature 15. Low artifact densities evident in the space between Feature 15 and Features 32, 35, and 42 may represent an activity zone exempted from disposal. Another concentration of sherds and firecracked rocks around 856R889 may represent disposal associated with the use of Feature 22, an Ashe Ferry phase shallow hearth or roasting facility.

A small, but particularly dense concentration of sherds (133 sherds/m²) and fire-cracked rocks (>7kg/m²) was evident in unit 855R889. Here, redeposited soils formed a narrow berm at the edge of the borrow pit on the northern margin of the site. The adjacent area (approximately 110m²) to the east of this concentration evinced only vestiges of plowzone and very low artifact densities, apparently a function of modern mechanical scraping of the surface and displacement of plowzone soils (and artifacts) to the brink of the borrow pit.

High ceramic sherd densities in test unit 850R850 reflect the unit's intrusion into refuse deposits within Feature 76. Discrete high density clusters of sherds and fire-cracked rocks are documented adjacent to Features 21 and 81, indicating refuse disposal around and within these feature contexts. In the case of Feature 21, a rock-filled roasting facility, the concentration of fire-cracked rocks was located in the plowzone over the feature, while concentrations of ceramic sherds were located northwest of the facility. High densities of fire-cracked rocks in unit 832R886, adjacent to Feature 17, probably represent plow movement of material from the top of this Ashe Ferry phase rock filled roasting facility. High ceramic sherd densities in unit 820R930 reflect fragments of a single fabric impressed vessel attributed to an ephemeral Badin phase site occupation.

A 200m² area on the terrace crest in the east central portion of the site evinces the greatest concentration of discrete features (Features 43, 44, 45, 50, 51, 53, 55, 56, 57, 58, 62, and 69), including graves, postholes, shallow basins, rock-filled roasting facilities and deep pits. With the exception of Feature 53 (an Early Brown phase rock-filled roasting facility) and Feature 58 (a Deptford phase basin), these features are associated with the Ashe Ferry phase site occupations. Plowzone deposits in this area are not particularly distinguished by concentrations of ceramic sherds, lithic artifacts or fire-cracked rocks, and no dumps or truncated middens are indicated (Figure 4.17). This precinct, which constitutes the most elevated portion of the site, appears to have been the locus of multiple activity sets exclusive of refuse disposal, and may represent the primary residential area at the site during the Ashe Ferry phase. Other portions of the terrace crest and frontslope are either truncated by soil borrowing or obscured by construction of the SC Highway 5 causeway, and similar residential loci may have been destroyed by these activities.

The terrace backslope, which constitutes the southwestern portion of the site (approximately 60% of the total site area) appears to have been reserved for activities segregated from core residential behaviors. Most of the deep storage pits and large rock-filled roasting facilities are situated on the backslope, but few other feature types are documented in this precinct (i.e., no graves, postholes). Spatial segregation of the roasting facilities may have spared the site inhabitants some smoke nuisance (although most of these facilities are upwind of the presumed residential area) and segregation of deep pits kept foot traps out of high traffic areas. Moreover, position of deep pits on the backslope took advantage of finer grained sediments that might better support pit walls. The spatial segregation of these facilities from the presumed residential area also connotes segregation of activity sets, i.e., large pits and large roasting facilities were not components of daily residential activities, but rather were elements of one or more specialized processing or storage activity sets. As suggested in the preceding discussions of rock-filled roasting facilities and deep storage pits, one documented processing activity at the site

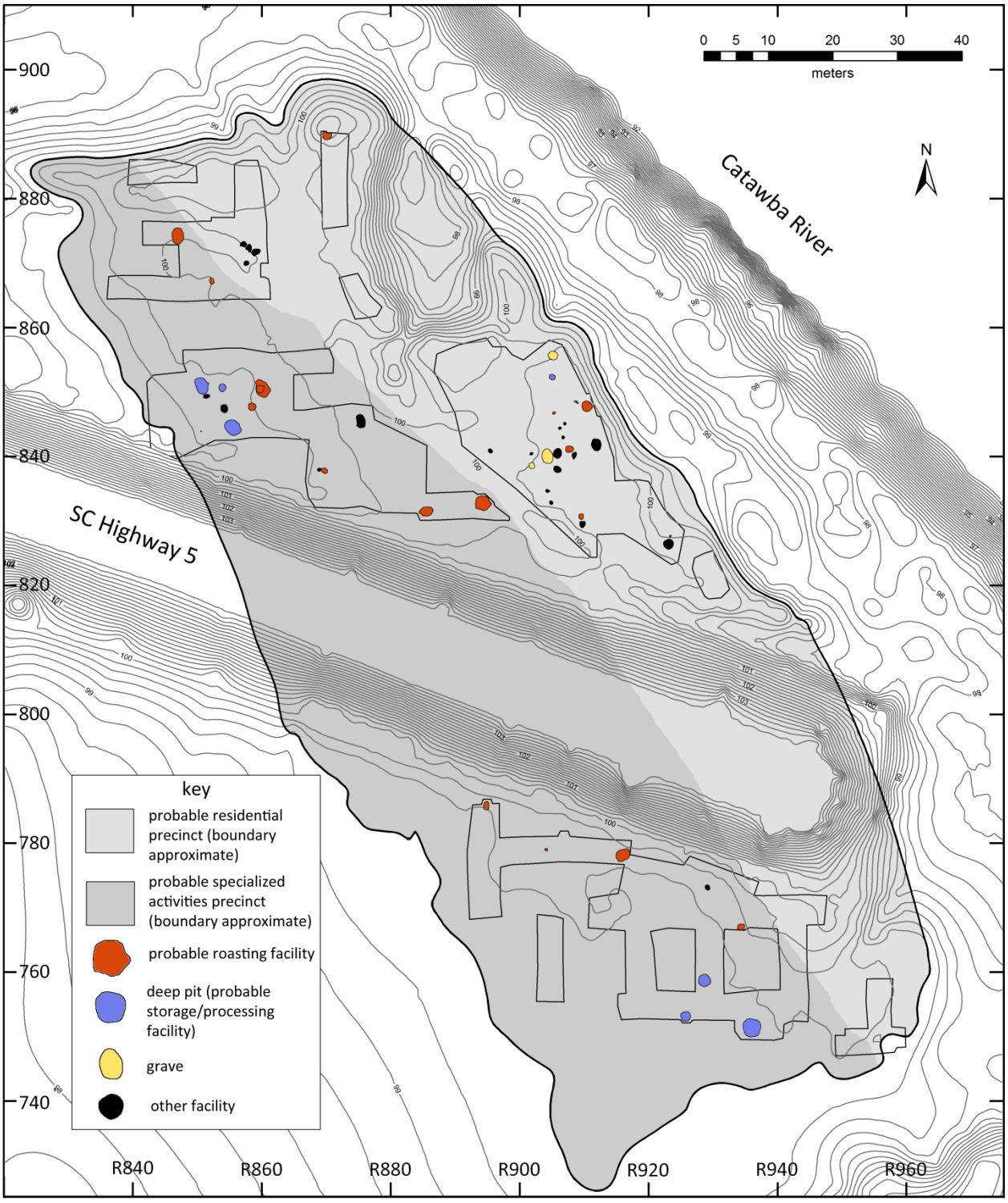

Figure 4.17. Map of 38YK533 indicating hypothesized spatial precincts.

involved roasting or parching of acorns. Processing of large quantities of acorns at 38YK533 is indicated by unusually high frequencies of acorn nutshell fragments in the matrices of rock-filled roasting facilities and discarded charred wormy acorn nutmeats in deep storage pits. As indicated by the series of AMS dates derived from discrete feature contexts at 38YK533 (and bolstered by temporal variation evident in the ceramic assemblage), primary occupations represented at the site were not synchronous, but rather distributed over a 350-year span. Therefore, the spatial structure of the site cannot be interpreted as the product of a single integrated occupational event, but rather as the accretional product of redundant use of space by multiple generations of site occupants. Such spatial redundancy is almost certainly the effect of stable physical characteristics of the site; site occupants used and reused the most elevated, well drained portion of the terrace as a residential surface. This area offered the most direct access to the Catawba River as a source of fresh water and as a distinct resource zone, and was directly proximate to a stone fishweir and ford in the river. Redundant use of this surface over a substantial span is indicated by diagnostic artifacts associated with Late Archaic, Middle Woodland, Late Woodland, and Mississippian period occupations. However, lack of coherent architectural evidence, and generally low diversity of facilities, is inconsistent with "permanent" occupation of 38YK533 as a residential base, and may instead indicate shorter-term occupations of the site as a seasonal camp. The scale of these occupations was undoubtedly small, possibly on the order of one or two households at any given time.

The possible functions of redundant seasonal occupations at 38YK533 may be better reflected in nonresidential areas. The backslope area, west and south of the terrace crest, presented two distinct attributes—spatial separation from the presumed residential area, and finer grained sediments than those found on the terrace crest—that may have been desirable for nonresidential activities (e.g., large-scale processing and storage of foodstuffs). Use of this area throughout the Late Woodland and early Mississippian period occupations is clearly indicated by the range of associated AMS dates (most of which derive from deep storage pits and rockfilled roasting facilities in the backslope area), and long-term continuity or redundancy in the type of activities conducted in this area is supported by the uniformity of facility forms and content through time. The unusually high incidence of acorn nutshell fragments and acorn nutmeats documented in backslope contexts may reflect recurrent use of the site as a base for acorn gathering, processing and storage during the Ashe Ferry and Early Brown phases.

If redundant Ashe Ferry and Early Brown phase occupations at 38YK533 focused on acorn procurement, processing and storage, the site location may have presented a "best fit" for the requirements of various activities involved in acorn exploitation. Proximity to oak groves with desired acorn types would have been necessary to reduce transportation costs. Such groves were likely not represented on the first terrace or within the Pleistocene aged backswamp, but may have grown on the extensive old terrace systems located .5–1km southwest of the site. Position of the site near the river provided ready access to unlimited quantities of fresh water for leaching of acorns for immediate use, and location of the site at a river shoal facilitated gathering of river cobbles used in roasting facilities. First terrace sediments presented suitable substrates for effective leaching of acorns, either passive, longer-term leaching via burial in pits, or more immediate leaching by pouring water over acorn meal in sand beds, a process documented among California natives (Ortiz 1991). Settings with this suite of characteristics are likely widespread in the lower Catawba River Valley, and components such as those represented at 38YK533 are probably commonplace, but remain largely undocumented. What may set the Ashe Ferry site apart from similar "acorn camp" sites is its position at a primary transportation

node, the Twelvemile Ford over the Catawba River. This location likely enhanced the accessibility and visibility of the Ashe Ferry site, especially in relation to site 38LA125, a probable early Ashe Ferry phase residential site located on the opposite side of the Catawba River. Unfortunately, the contemporaneity of 38LA125 with 38YK533 cannot be evaluated because 38LA125 was destroyed *en toto* by the clay mining operations of the Ashe Brick Company and its successor, the Boral Brick Company.