

## Results of Data-Recovery Investigations

The revised final preferred alternative roadway design reduced the APE at Site 7NC-E-152. Areas subject to potential project effects extended from the base of the existing road berm westward to the limits of the temporary construction easement or right of way (see Figure 4.1). The boundaries encompassed an area of approximately 550 square meters (1,804.5 feet) and included all or portions of Clusters 1, 3, and 4. Portions of Cluster 1 and all of Cluster 2 were outside the revised APE and would not be affected during construction activities.

### FIELD RESULTS

#### *Fieldwork Stage 1*

KSK completed the initial stage of the Phase III data-recovery program in the spring of 2004. The effort involved the excavation of 10% of the areas occupied by each of these three clusters, or 22 total 1-x-1-meter (3.3-x-3.3-foot) excavation units (EUs 26–47) (see Figure 4.1). Of these EUs, most were located within the identified limits of the remaining clusters, with two having been placed within Cluster 1, six in Cluster 3, and 12 in Cluster 4. The final two units were situated between Clusters 1 and 3 (N25 E24) and 3 and 4 (N58 E22), respectively, intended to provide additional information regarding the distribution of artifacts outside of well-defined artifact concentrations.

Cluster 1 was adjacent to the small tributary stream forming the southern boundary of the site. EUs 35 and 37 were excavated in Cluster 1, forming a 2-x-2-meter (6.6-x-6.6-foot) block with Phase II Units 9 and 18. The plowzone (Ap2) in the two units was a brown (10YR 4/3) sandy loam and was excavated in three levels. The base of the plowzone sloped downward to the west, paralleling the slope of the ground surface. Prehistoric artifacts from the stratum include debitage, FCR, an endscraper, a point, and two pieces of prehistoric ceramics. Historic artifacts include a piece of bottle glass and four pieces of unidentifiable metal. Total prehistoric artifact densities from the plowzone ranged from 5 to 15 per 50-x-50-centimeter- (1.6-x-1.6-foot-) quadrant (quad). The subsoil consisted of yellow brown (10YR 5/6) silty sand. A high gravel content was present in EU 35. No historic artifacts were found in the subsoil of either EU. Artifact densities in the uppermost 10-centimeter (3.9-inch) level of the B horizon ranged from 1 to 5 per quad and included a single ceramic sherd. No artifacts were found in the second level, after which excavation in the EUs was terminated.

Cluster 3 was located between Cluster 1 and the access ramp. Six EUs were excavated (34, 36, 39, 41, 44, and 45), forming a block that included three Phase II units. The plowzone (Ap2) consisted of brown (10YR 4/3) sandy loam with river cobbles and was excavated in 10-centimeter (3.9-inch) levels. Approximately 16 centimeters (6.3 inches) of culturally sterile material (Ap1) was identified overlying the plowzone in EU 39. Twenty-two historic artifacts were found in the plowzone of the six EUs, including glass, nails, a spike, a mirror, and unidentifiable metal. Prehistoric artifact densities were relatively low in the upper level ( $n=47$ ) and two of the EUs produced no artifacts from the context. Densities were highest in the second

( $n=213$ ) and third level ( $n=158$ ), present in only two units. The artifact count from the third level includes 129 pieces of fire-cracked rock (FCR) found in EU 39. Overall, prehistoric densities in the plowzone ranged from 4 to 25 per quad, excluding the FCR cluster.

The B-horizon subsoil in the Cluster 3 units consisted of yellow brown (10YR 5/6) sandy loam with gravel. No historic artifacts were found. Prehistoric artifacts from the upper 10 centimeters (3.9 inches) of the subsoil number 54 and include FCR, debitage, a core, tested cobbles, two hammerstones, two scrapers, and utilized flakes. Ten artifacts, including a hammerstone and a scraper, were found in the second level. Large cobbles were found in the third, lowermost level of EU 34, but no artifacts were found. Large rocks were also found in the northern half of EU 36.

Cluster 4 was located in the portion of the APE north of the access ramp. Twelve EUs were excavated in three groups. EUs 28, 30, and 32 were placed near Phase II Unit 17 in the southern portion of the cluster. EUs 26, 29, 31, 40, and 42 were placed near Phase II Units 8 and 11 in the center of the cluster. EUs 27, 33, 43, and 46 were placed in the northern portion of the cluster, connecting Phase II Units 12 and 16. The plowzone was dark brown to very dark gray brown (10YR 3/3–4/2) silt loam with gravel. With the exception of EU 30, where it was removed as a single stratum, the plowzone was excavated in 10-centimeter levels. Historic artifacts from the plowzone consist of nails, bottle glass, and ceramics, including creamware, pearlware, and red-bodied earthenware. Prehistoric artifacts number 622 and include debitage, cores, bifaces, tested cobbles, hammerstones, and a variety of tools, including five points.

The B-horizon subsoil consisted of yellow brown (10YR 5/6) silt loam with gravel and cobbles. Four EUs in Cluster 4 were excavated into the fourth level of the subsoil, three were excavated to the third level, and the remaining EUs were terminated after the second level was complete. Three pieces of window glass are the only historic artifacts recovered from the subsoil. However, 209 prehistoric artifacts were found, including cores, bifaces, tested cobbles, hammerstones, and three tools.

Feature 3, a cluster of cobbles with apparent evidence of use, was found in the upper level of subsoil in EU 30.

Of the two EUs excavated outside of designated clusters, the first (EU 38; N25 E24) was placed between Clusters 1 and 3 and immediately adjacent to the existing Churchman's Road berm. This location had been previously examined during earlier Phase II investigations via a series of close-interval shovel test pits (STPs) and produced a number of consecutive tests containing slightly elevated quantities of prehistoric artifacts. EU 38 was placed in the vicinity of STP 28 and revealed approximately 35 centimeters (1.2 feet) of fill that was removed without screening. Below the fill was a 7-to-15-centimeter- (2.8-to-5.9-inch-) thick layer of dark yellow brown (10YR 4/4) sandy loam with two historic ceramic sherds. A buried fill lens of coarse strong brown (7.5YR 5/6) sand and gravel was present below this layer. It measured from 2 to 6 centimeters (0.8 to 2.4 inches) and contained no artifacts. A truncated plowzone with plow scars at the base was found below the sandy fill. It measured from 6 to 12 centimeters (2.4 to 4.8 inches) in thickness and produced both historic and prehistoric artifacts. Prehistoric artifacts

from the plowzone consist of four ceramic sherds and 63 lithics, including three small steatite chips and 12 pieces of FCR. Historic artifacts number 11 and include ceramics, glass, and nails.

The subsoil in EU 38 was a dark yellow brown (10YR 5/4) coarse sandy loam. Two 10-centimeter (3.9-inch) levels were excavated from the subsoil. Two prehistoric artifacts were found in the uppermost level and no artifacts were found in the lower level.

In all, excavations in EU 38 resulted in the recovery of 70 prehistoric artifacts, including 42 pieces of manufacturing debitage, two tested cobbles, five cobble tools (hammer/anvil stones), 12 pieces of FCR, a utilized flake, a unifacial tool, and four sherds of Native American pottery. Though bearing no signs of intentional exterior or interior decoration, the recovered pottery exhibits mica flecking in the body paste like those fragments found in EU 35 (Cluster 1), and may be of comparable age and cultural association. Given the elevated artifact counts recovered from EU 38, the area defined via this unit and Phase II STPs 26–28 was determined to constitute a probable fifth prehistoric artifact cluster (Cluster 5) within the larger 7NC-E-152 site boundaries, and an apparent second spatially distinct Woodland component.

EU 47 was placed just south of the access ramp between Clusters 3 and 4. The EU produced the typical soil profile, consisting of a plowzone overlying B-horizon subsoil. Excavation was terminated after the second 10-centimeter level of subsoil, which produced no artifacts. Artifact densities in the EU were low. The plowzone produced a core, a middle-stage biface, and nine pieces of debitage.

Completion of the initial Phase III units resulted in the recovery of 1,542 prehistoric artifacts and the identification of a single possible subsurface feature. As was the case with the results of Phase II testing, the overwhelming majority of prehistoric artifacts (74.8%) consist of quartz-dominated manufacturing debitage, along with lesser amounts of chipped tools ( $n=38$ ; 2.5%), simple cobble tools (hammerstones/anvil stones [ $n=64$ ; 4.2%]), and FCR ( $n=214$ ; 13.8%). While Phase II testing produced no evidence of prehistoric pottery in any unit, a total of seven sherds of pottery (0.5%) were recovered from two separate Phase III Stage 1 EUs (35 and 38). Three pieces of steatite were also found.

The bulk of cultural materials (approximately 80%) originated within plowzone soils (Ap2), and in particular from the bottom 10 to 15 centimeters (3.9 to 5.9 inches) of that stratum. The remaining 20% of artifacts from the site were retrieved from intact B-horizon contexts. Individual EUs exhibited a wide range of artifact densities (maximum range=16–149), with an overall average of 74 artifacts/EU for all Phase III excavation units. All three clusters contained within the preferred alternative design study area suggested some degree of internal artifact patterning that may be tentatively associated with specific sets of conditions and/or posited prehistoric behavioral patterns.

### *Fieldwork Stage 2*

Based on the results of the Stage 1 Phase III investigations, additional data-recovery excavations were recommended at Site 7NC-E-152 to increase both the quantity of artifacts and provide additional information on intrasite patterning. Based on the information recovered at the time, it

was proposed that the completion of an additional 60 EUs, constituting a total Phase III sample size equivalent to 15% of the total APE, was warranted. The EUs were to be used to recover a larger sample of cultural deposits within each cluster, including a more extensive collection of diagnostic artifacts to further refine site chronology; larger contiguous blocks to more thoroughly delineate preserved intrasite artifact patterning; and greater subsoil exposure to search for additional evidence of features.

DelDOT and DE SHPO concurred with the above recommendation, and KSK completed Stage 2 Phase III investigations between November 2004 and January 2005. This stage of investigation included completion of a total of 82 EUs and expanded the combined Phase III sample to 18.9% of the total preferred alternative study area. The total number of EUs and the percentage of the site sampled are greater than those initially proposed at the conclusion of Stage 1. The slight increase in work completion was the result of being ahead of schedule, and due to a good-faith effort to recover the maximum possible information while remaining within project schedule and budget constraints. Targeting all remaining clusters, Stage 2 EUs were distributed in the following manner: Cluster 1, 8 EUs; Cluster 3, 10 EUs; Cluster 4, 61 EUs; and Cluster 5, 3 EUs (see Figure 4.1). The plowzone in the Stage 2 EUs was removed as a single excavation level, whereas excavation in the subsoil was conducted in 10-centimeter (3.9-inch) levels.

Seven of the eight EUs (Units 67–69, 72, 74, 76, and 78) in Cluster 1 were excavated to expand the existing 2-x-2-meter (6.6-x-6.6-foot) block. EU 93 was placed to the south of the block to sample the margins of the cluster. Soil profiles in the block expansion were similar to those of the previous EUs. Artifacts from the plowzone include debitage, FCR, scrapers, three points, and two sherds of prehistoric ceramics. Historic and modern artifacts were also found, including nails, glass, whiteware, earthenware and salt-glazed sherds, and metal. Prehistoric artifact densities ranged from two to 23 per quad. Two 10-centimeter levels were excavated into the subsoil. The upper level produced debitage, a ceramic sherd, two pieces of FCR, and a utilized flake. The lower level produced only two pieces of debitage.

EU 93 was on the southern edge of Cluster 1, closer to the roadway berm. The upper level of the EU consisted of 13–18 centimeters (5.1–7.1 inches) of recent colluvium, representing the Ap1 horizon. The plowzone (Ap2) was only 8–15 centimeters (3.1–5.9 inches) thick. Artifacts from the plowzone include debitage, a piece of FCR, and two hammerstones. Artifacts from the upper level of the subsoil include debitage, a piece of FCR, a ceramic sherd, a biface, and a hammerstone. Three historic artifacts were also found, likely resulting from deep plow disturbance of the subsoil. The artifacts include a medicine bottle, a piece of unidentifiable metal, and a bottle glass fragment. Only two pieces of debitage were found in the second level of the subsoil and excavation in the unit was terminated at the base of the level.

Ten EUs were excavated in Cluster 3, nine (EUs 64–66, 71, 79, 80, 83, 87, and 88) of which were placed to expand the existing block. EU 84 was placed to the southeast of the block to sample the margins of the cluster. Soil profiles were similar to those found during the Stage 1 excavations, consisting of a plowzone (Ap2 horizon) overlying B-horizon subsoil. Prehistoric artifact densities in the plowzone of the block expansion ranged from one to 22 per quad. The stratum produced debitage, scrapers, FCR, hammerstones, and two points. Historic artifacts include creamware, whiteware and earthenware sherds, nails, glass, unmodified metal, and brick.

The upper level of the subsoil contained 31 pieces of debitage, a late-stage biface, a core, a tested cobble, four hammerstones, and four pieces of FCR. The second level produced only two pieces of debitage and a small piece of FCR.

The plowzone in EU 84 produced 30 prehistoric artifacts, including debitage and FCR. A piece of window glass was also recovered. The subsoil of the EU produced only a single piece of debitage.

Stage 2 excavations in and near Cluster 4 involved the excavation of 61 EUs, most of which were placed to join the three small block excavations (see Figure 4.1). EUs 127, 128, and 129 were final units excavated to complete the block configuration; these were not excavated in quadrants and only the plowzone was removed. EU 95 was placed to sample the margins of the cluster. Soil profiles were similar to those from the Stage 1 excavations. In EUs closest to the roadway, an Ap1 horizon with disturbance from road construction was present. It was removed and screened as part of the plowzone (Ap2 horizon).

Excavations in the plowzones of the expanded block (excluding EU 95) produced 2,226 artifacts, including two cordmarked ceramic sherds, 1,576 pieces of debitage, 450 pieces of FCR, 42 bifaces, 40 cores and tested cobbles, 21 points, and 95 other tools. The tools include hammerstones and anvils, scrapers, spokeshaves, and flake tools. The upper level of the subsoil produced 448 artifacts. No ceramics were found, but the lithic assemblage is similar to that found in the plowzone. The second level of the subsoil was excavated from 38 EUs and produced 121 artifacts, approximately three per excavation unit. The artifacts include debitage, FCR, a biface, a point, and five tools.

Where artifact densities were relatively high, a third subsoil level and, if necessary, a fourth was excavated. A third level was excavated from 28 EUs, producing only 34 pieces of debitage and a tested cobble. A fourth level was excavated from 14 EUs and produced only seven pieces of debitage. A fifth level was excavated from EU 90, but no artifacts were found.

EU 95, placed on the western edge of Cluster 4, produced a plowzone assemblage of 43 lithic artifacts, including debitage, FCR, two cores, a tested cobble, and a hammerstone. Historic artifacts include a nail, two pieces of bottle glass, a piece of window glass, and four ceramic sherds, two of creamware and two of red-bodied earthenware. The first level of the subsoil produced only four pieces of debitage and five pieces of FCR. Because of the high gravel content and low artifact density, excavation in the EU was terminated after the first subsoil level.

EU 102 was a discretionary unit excavated on relatively level terrain to the west of Cluster 4. The EU was placed to provide additional confirmation that Cluster 4 did not extend farther to the west. The plowzone produced 26 prehistoric artifacts, including debitage, FCR, a core, a tested cobble, a utilized flake, and four hammerstones. Nine historic artifacts were found, including four pieces of brick, two sherds of creamware, two sherds of red-bodied earthenware, and one sherd of pearlware. The subsoil contained both gravels and larger cobbles. Two levels of the subsoil were excavated, but no artifacts were found.

A soil stain, designated Feature 4, was encountered at the base of the plowzone in EU 92. The stain was shallow and was interpreted in the field as a rodent run. However, soil and charcoal samples were retained for radiocarbon dating.

Three EUs (73, 75, and 77) were excavated within Cluster 5. Roadway fill was identified at the surface of the EUs, and in EUs 75 and 77 was removed without screening. The plowzone and B-horizon subsoil as found elsewhere on the site were present below the fill. Artifacts recovered from the plowzone number 70 and include debitage, FCR, three sherds, a biface, a core, and three tools. No historic artifacts were found. The upper level of the subsoil produced a ceramic sherd, a tested cobble, and seven pieces of debitage. No artifacts were found in the second level of the subsoil.

The conclusion of Stage 2 work resulted in the recovery of an additional 3,818 prehistoric artifacts. Included among the cultural assemblage are 2,871 pieces of debitage, 61 bifaces, 62 cores and tested cobbles, 119 chipped stone tools, 72 cobble tools, 616 FCR fragments, seven pieces of mica, and 10 Native American pottery sherds. Preliminary analysis of the results significantly improved our understanding of both site chronology and the internal disposition and integrity of the artifact deposits comprising Clusters 1, 3, 4, and 5.

## RESULTS OF LABORATORY ANALYSIS

### *Radiocarbon Analysis*

One wood charcoal sample from Feature 4 was submitted to BetaAnalytic, Inc., for radiocarbon analysis. The sample returned a date of  $1160 \pm 40$  B.P. with a 2-sigma calibrated range of A.D. 780 to 990 (Appendix C). The date places the feature in the later portion of the Woodland I period.

### *Debitage and Tested Cobbles*

In all, 4,724 pieces of debitage were found in Phase II and III excavations (Table A.2). Just over half (52.9%) of the lithic material is of quartz. Chert, likely from Columbia Formation gravels, is second in importance (13.9%). Other gravel lithics represented in the assemblage are red and yellow/brown jasper, rose quartz, quartz crystal, quartzite, and ironstone. Rhyolite, a non-local material, makes up only 0.5% of the debitage assemblage. Other lithics represented in the debitage include one flake each of argillite, sandstone, and igneous/metamorphic material.

Cortex is present on 12 (27.3%) of the 44 pieces of Cecil County black flint, all of which is block cortex, confirming the material as coming from an outcrop source (see Table A.2). Iron Hill jasper produced a similar result, with only block cortex found. The proportion of flakes with cortex for Columbia Formation material is varied, ranging from 9.5% for quartz crystal to 64.1% of rose quartz. Most of the identifiable cortex is cobble, but small amounts of block cortex were also found. This result may indicate that sources of quartzite, quartz, and cherts in the Piedmont province were utilized along with local gravel sources.

The distribution of debitage by flake type indicated a somewhat greater emphasis on the later stages of reduction (Table A.3). In general, the combined proportion of biface-thinning and finishing flakes is higher for material from the Delaware Chalcedony Complex than material

from the Columbia Formation gravels. An exception is quartz crystal debitage, 77.7% of which are biface-thinning flakes.

Of the 71 tested cobbles recovered at 7NC-E-152 quartz comprises 57.7%, quartzite 32.4%, chert 7.0%, jasper 1.4%, and ironstone 1.4% (see Table A.2). All of the tested material has cobble cortex.

#### *Form Tools and Bifaces*

In all, 45 points or fragments were recovered from the Phase II and III investigations, including three fragments that refit (Table A.4). The point assemblage is characterized by a relatively large number ( $n=11$ ) of examples with tapering stems and rounded bases (Figure 5.1). Some of these points have weak shoulders, whereas others are lozenge-shaped and have no shoulders. The latter type is classified as Rossville, whereas the former is classified as Poplar Island. It is recognized, however, that the two are likely slight variations of the same type, which date to the early portion (Late Archaic–Early Woodland) of the Woodland I period. Points of this form were found in stratified context on Piney Island in the lower Susquehanna River in levels dating from 3360 B.C. to sometime between 2050 and 1770 B.C. (Kent 1970, 1996). The form extended to as late as 610 B.C. on Calver Island (Miller et al. 2007). Both islands are located in the lower Susquehanna River. The tapering stemmed form, classified as Piscataway, was found at the Pig Point Site in Late Archaic through Early Woodland contexts, but not in Middle or Late Woodland contexts (Luckenbach et al. 2010).

In addition to the tapering stemmed points, six fragments of straight-stemmed points were found at 7NC-E-152, including three that refit. The points could not be classified by type. The assemblage also included one unidentifiable contracting stem point base.

Occupation from the later portion of Woodland I is evidenced in two points classifiable as Fox Creek, one a Fox Creek stemmed point from Cluster 4 and one a Fox Creek lanceolate type from Cluster 1 (Figure 5.2). One small lanceolate point of argillite, found in Cluster 4, may also be a Fox Creek variety. Custer (2001), citing Dent (1995), gives an age range of A.D. 400 to 900 for Fox Creek points. The late Woodland I period is also represented in a Jacks Reef pentagonal point of quartz found in Cluster 4 (see Figure 5.2). Custer (1989) notes that Jacks Reef points are often associated with Hell Island ceramics, which date between A.D. 600 and 1000. The Fox Creek and Jacks Reef points may be associated with the occupation that produced Feature 4, which was radiocarbon dated to the same period.

Four triangular points were found—two of red jasper, one of Iron Hill jasper, and one of chert (Figure 5.3). The jasper points all came from Cluster 4 and the similarity of material suggests that they may be from a single occupation. The chert triangle is from Cluster 1. As discussed above, triangular points are now known to have been in use during the Archaic and Woodland I periods, as well as the Woodland II period, so they are of limited use in dating the site.

Side-, eared-, and corner-notched points were found, six of which fit easily into the Brewerton category and two of which could not be typed (Figure 5.4). The notched points could be associated with any of the Woodland I period occupations at the site.

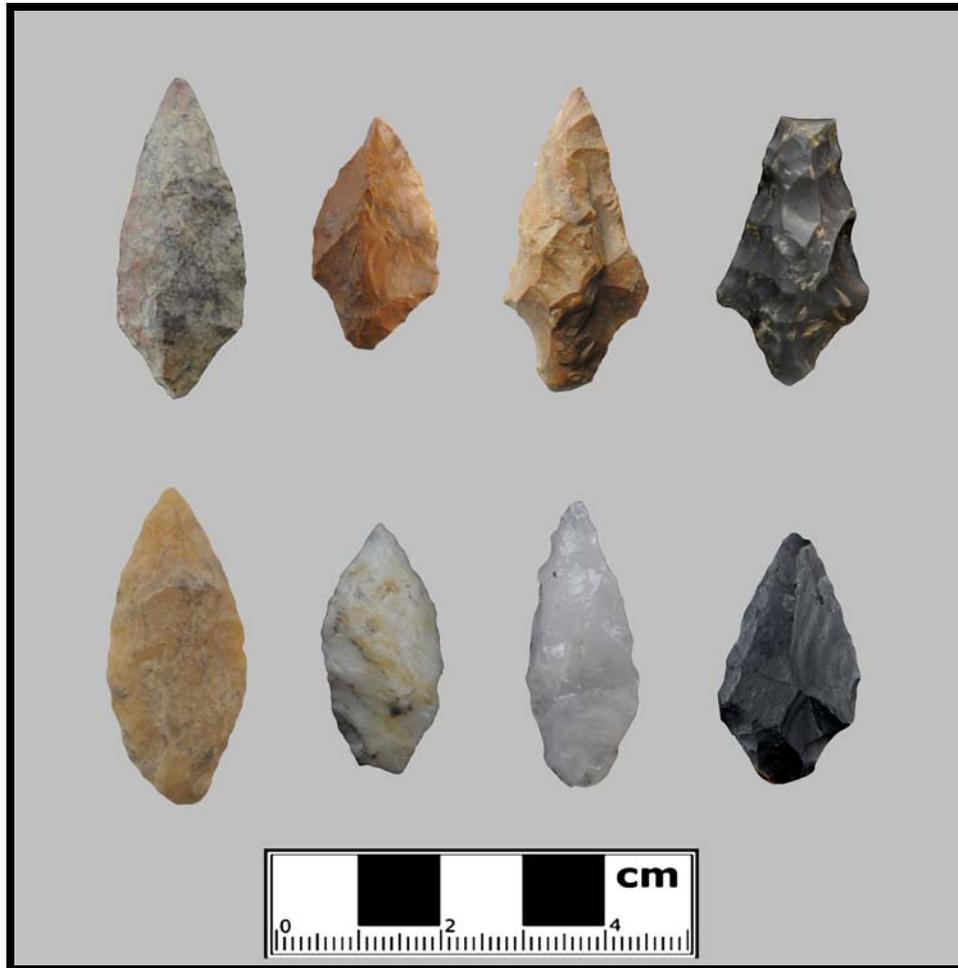


Figure 5.1 Poplar Island and Rossville points. Top Row, left to right: Cat no. 453A.2, EU 58, Stratum II, Cluster 4; Cat no. 401A.1, EU 54, Stratum I, Cluster 4; Cat no. 202A.1, EU 26, Stratum I, Cluster 4; Cat no. 400A.7, EU 53, Stratum I, Cluster 4. Bottom row, left to right: Cat no. 260D.2, EU 32, Stratum II, Cluster 4; Cat no. 410A.1, EU 49, Stratum II, Cluster 4; Cat no. 43.2, EU 11, Stratum II, Cluster 1; Cat no. 408C.1, EU 52, Stratum I, Cluster 4.



Figure 5.2 Fox Creek and Jacks Reef points. Top row, left to right: Cat no. 271B.1, (lanceolate), EU 33, Stratum I, Cluster 4; Cat no. 469D.1 (Fox Creek lanceolate), EU 67, Stratum I, Cluster 1. Bottom row, left to right: Cat no. 573D.11 (Fox Creek stemmed), EU 104, Stratum I, Cluster 4; Cat no. 357C.1 (Jack's Reef Pentagonal), EU 43, Stratum I, Cluster 4.

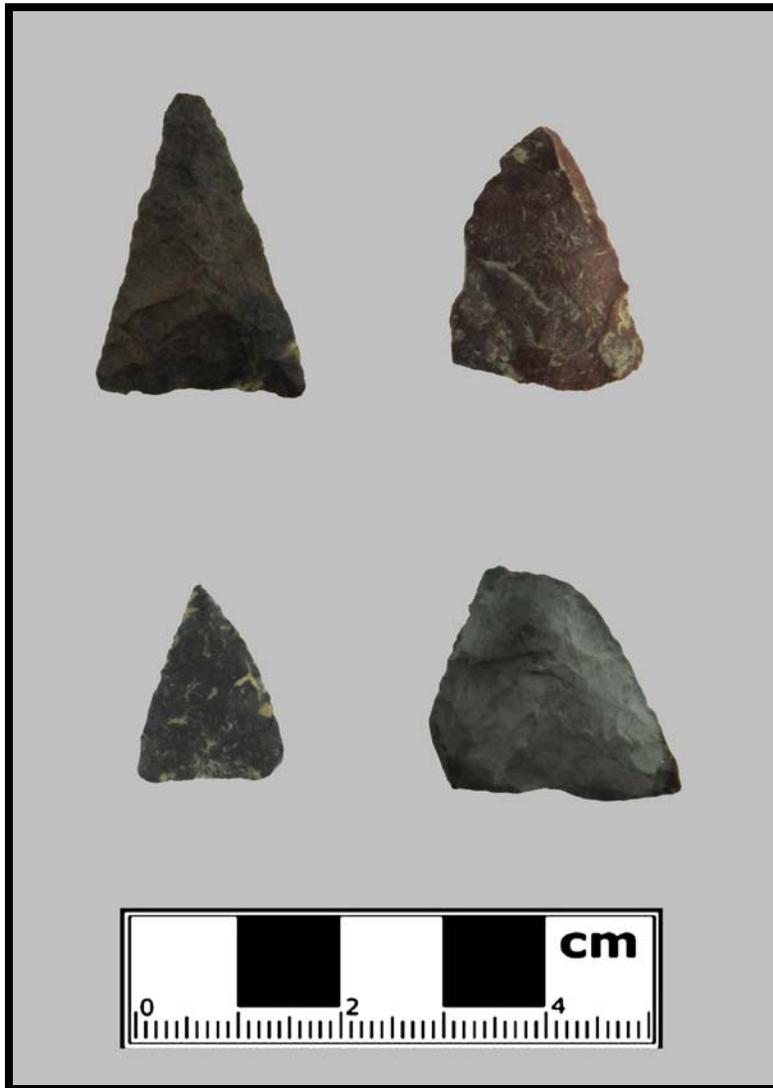


Figure 5.3 Triangular points. Top Row, left to right: Cat no. 28A.1, EU 8, Stratum I, Cluster 4; Cat no. 65A.1, EU 16, Stratum I, Cluster 4. Bottom row, left to right: Cat no. 580D.1, EU 105, Stratum 2, Cluster 4; Cat no. 33A.1, EU 9, Stratum I, Cluster 1.



Figure 5.4 Brewerton points. Top row, left to right: Cat no. 476C.17, EU 69, Stratum I, Cluster 1; Cat no. 554A.1, EU 97, Stratum I, Cluster 4; Cat no. 620D.1, EU 126, Stratum I, Cluster 4. Bottom row, left to right: Cat no. 260D.1, EU 32, Stratum I, Cluster 4; Cat no. 573D.5, EU 104, Stratum I, Cluster 4; Cat no. 329A.1, EU 40, Stratum I, Cluster 4.

One bifurcate base point, classified as a St. Albans stemmed point, was found in Cluster 3 and represents the only definitive evidence of Archaic period occupation at the site (Figure 5.5). The point is fashioned of a tan chert, the source of which is unknown. Custer (1989) places bifurcate points in the Archaic period (6500 to 3000 B.C.), but St. Albans points were dated to 7000 to 6500 B.C. at the St. Albans Site in West Virginia (Broyles 1971). A St. Albans point was associated with a radiocarbon date of circa 7310 B.C. at Site 36PE16, located along the Susquehanna River.

One possible broadspear was found in Cluster 4 (see Figure 5.5). It has a broken tip and base, but given its size and the form of the shoulders, it likely represents a Susquehanna broadspear.

Other points include a teardrop point of argillite. Custer (2001) assigns this point type to the Early Woodland (Woodland I) period. An untyped lanceolate or ovoid point fragment with a concave base was also found; it is made of quartz but may have been unfinished.

Seven points cannot be classified: five tip fragments, a medial section, and a whole, crude point that retains cortex and is likely unfinished.

Of the 50 form tools, 34 are endscrapers, side scrapers, or a combination of the two (Table A.5; Figure 5.6). Other tools include five spokeshaves, six unifacial tools, two bifacial knives, and three reworked points (Figures 5.7 and 5.8). The points were reworked into a spokeshave, a scraper, and a reamer.

Bifaces number 99 and include 11 early-stage, 26 middle-stage, 50 late-stage, and 12 unidentifiable forms (Table A.6). There are fewer chert and quartzite bifaces relative to the overall distribution of artifacts by lithic type, and more bifaces of quartz and quartz crystal.

#### *Cores and Flake Tools*

Fifty-one cores were identified, 48 of which are freehand and three of which are bipolar (Table A.7). Materials are confined to those available in the local gravel deposits; i.e. chert, jasper, quartz, and quartzite. Quartz (58.8%) and quartzite (19.6%) comprise most of the material. Cortex is present on all but five of the cores, most of which is cobble cortex. Only two cores have block cortex, both of which are quartzite. Evidence of heat treatment was found on nine of the cores, including quartz, quartzite, chert, and jasper materials.

Weights of unbroken cores range from 3.2 to 500 grams. The two complete jasper cores are at the low end of the weight range, whereas quartz and quartzite cores are at the high end. Given the small number of bipolar cores, it is not possible to compare the two subassemblages. Notably, however, bipolar cores are not at the low end of the weight range, which was the case at Hickory Bluff.

Flake tools include four retouched flakes and 71 utilized flakes (Table A.8; see Figure 5.8). Two notched flakes and two graver flakes were also found. Compared to the proportions of lithic materials in the debitage, there appears to be a preference for cryptocrystalline quartz, such as cherts and jasper, for use as flake tools over materials like quartz and quartzite.



Figure 5.5 St. Albans and miscellaneous other points. Top Row, left to right: Cat no. 474B.8 (St. Albans), EU 66, Stratum I, Cluster 3; Cat no. 589D.1, (Teardrop) EU 108, Stratum I, Cluster 4. Bottom row, left to right: Cat no. 406D.1, (Susquehanna Broadspear) EU 50, Stratum I, Cluster 4; Cat no. 233B.1, (untyped lanceolate) EU 29, Stratum I, Cluster 4.



Figure 5.6 Representative examples of scrapers. Top Row, left to right: Cat no, 77C.6, EU 19, Stratum I, Cluster 1; Cat no. 459D.1, EU 64, Stratum II, Cluster 3; Cat no. 40D.1, EU 11, Stratum I, Cluster 4. Bottom row, left to right: Cat no. 574D.1, EU 104, Stratum II, Cluster 4; Cat no. 254A.1, EU 31, Stratum I, Cluster 4; Cat no. 592A.6, EU 114, Stratum I, Cluster 4.



Figure 5.7 Bifacial knives and reworked points. Top row, left to right: Cat nos.: 597A.1, (knife) EU 116, Stratum I, Cluster 4; Cat no. 476C.18 (knife) EU 69, Stratum I, Cluster 1. Bottom row, left to right: Cat no. 491C.1, (reworked point) EU 75, Stratum I, Cluster 5; Cat no. 608D.1, (reworked point) EU 120, Stratum I, Cluster 4; Cat no. 570C.1 (reworked point) EU 98, Stratum I, Cluster 4.



Figure 5.8 Representative examples of other tools. Top row, left to right: Cat no. 589C.1 (spokeshave/graver), EU 108, Stratum I, Cluster 4; Cat no. 493A.1 (retouched flake) EU 78, Stratum I, Cluster 1; Cat no. 616B.1 (graver) EU 125, Stratum I, Cluster 4. Bottom row, left to right: Cat no. 616A.2 (notched flake) EU 125, Stratum I, Cluster 4; Cat no. 401A.3 (retouched flake), EU 54, Stratum I, Cluster 4; Cat no. 401A.4 (utilized flake) EU 54, Stratum I, Cluster 4.

### *Cobble Tools*

Cobble tools number 155, most (82.6%) of which are hammerstones (see Table A.2). Other cobble tools include three abraders, 13 anvil stones, one mortar, a metate, and two pitted cobbles, likely used for grinding and crushing nuts or seeds. Seven unidentified tools were also found, six of cobble size and one of pebble size.

### *Microwear Analysis*

Of the 70 tools examined for the presence of microwear, 39 revealed potentially identifiable traces and were examined under high-power magnification (Table A.9). The activities represented in the tool assemblage include butchery (five points and three bifaces); meat cutting (one scraper, one retouched/denticulate flake, and one unifacial tool); bone/antler working (two graver, one scraper, two unifacial tools); hide scraping/cleaning (one graver, two scrapers, one retouched/denticulate flake, and two unifacial tools); and wood working (one scraper, and two retouched/denticulate flakes). Nine are indeterminate due to weathering and other post-depositional processes, and five yielded unidentifiable microtraces. Hafting traces are observed on 21 of the 39 tools examined. The results of the microwear analysis are incorporated into the spatial analysis section below.

### *Ceramics*

Only 17 ceramic sherds were recovered during Phase III investigations at the site, most of which are small and eroded (Table A.10; Figure 5.9). Seven plain body sherds were found in Cluster 1. Six are tempered with quartz and sand and one is tempered with grit, indicating that at least two vessels are present. One small sherd has two incised lines.

No ceramics were found in Clusters 2 or 3. Two cordmarked sherds were found in Cluster 4, both body sherds tempered with quartz grit and, despite the difference in thickness, may come from the same vessel.

Sherds from Cluster 5 include three cordmarked sherds, one net-impressed sherd, and four plain sherds. The temper is quartz grit or quartz and sand. Two of the plain sherds are rim fragments from the same provenience that mended. A small, cordmarked rim has a coil break at the base. The sherds indicate that at least five vessels are represented.

Overall, the sherds from Clusters 1, 4, and 5 generally resemble Woodland II Minguannan ceramics in that they are sand- and/or grit-tempered. One sherd from Cluster 1 appears to have a broadline-incised geometric design typical of Minguannan ceramics. Cordmarked sherds were present, but are too small to identify any decorative motifs. The net-impressed sherd likely represents a Woodland I Wolfe Neck or Susquehanna type. Overall, the ceramics indicate that Woodland II occupations were present in all three clusters. The net-impressed sherd, along with three steatite flakes, indicates that Woodland I occupation may also have been present in Cluster 5.



Figure 5.9 Ceramic sherds. Top row, left to right: Cat nos.: 618D.3, (plain), EU 112, Stratum I, Cluster 4; Cat no. 628.13, (plain), EU 128, Stratum I, Cluster 4; Cat no. 545A.1 (cordmarked) EU 93, Stratum II, Cluster 1. Bottom row, left to right: 478B.2 (cordmarked), EU 68, Stratum I, Cluster 1; Cat no. 298A.1 (incised), EU 35, Stratum II, Cluster 1; Cat no. 496A.5 (net-impressed) EU 77, Stratum I, Cluster 5.

### *Features and Fire-Cracked Rock*

FCR was recovered from both feature and non-feature contexts. In all, 876 pieces were found, with a total weight of 61.3 kilograms. Over 62% of the FCR is of quartzite.

Three cultural features were identified. Feature 1 was identified in Cluster 2 (EU 23) during the Phase II field survey (Figure 5.10). The feature consisted of a small basin-shaped pit bisected by the west wall of the unit. It was 36 centimeters (1.2 feet) in width along the unit wall and 23 centimeters (9.1 inches) deep. The fill was a dark brown 10YR 3/3 silt loam. Soils within the excavated portion of the feature were screened and produced a tested cobble of quartzite and a piece of quartz shatter. No evidence of charcoal or other non-lithic artifacts was noted within the feature fill. Two possible postholes were also identified in the same EU, but were interpreted as non-cultural. Given the absence of evidence of burning within the feature and the near-absence of artifacts, the function of the feature cannot be determined.

Feature 3 was found in Cluster 4 (EU 30) and consisted of a semi-circular arrangement of large cobbles and cobble tools in the upper 10 centimeters (3.9 inches) of the B-horizon subsoil (Figure 5.11). Included are three hammerstones, a pitted cobble possibly used as an anvil stone, two unidentifiable cobble tools, and two unmodified cobbles. No charcoal, soil stain, or oxidation was associated with the artifacts. However, a soil sample was recovered from the area around the rocks and processed via flotation. No artifacts were recovered. The sample produced a small amount of charcoal (0.2 grams). Although no organic soil stain was noted, the presence of the cobbles in the B horizon suggests that a pit was present. Feature 3 likely represented a cache of cobble tools.

Feature 4 was also found in Cluster 4 (EU 92). It consisted of a shallow soil stain measuring 22 x 35 centimeters (0.7 x 1.1 feet) (Figure 5.12). It had straight side walls and a maximum depth of 10 centimeters. The feature soil was dark yellowish brown (10YR 4/6) silt loam with charcoal flecking. The only artifact recovered from the screened and floated soil samples is a quartz flake fragment. The flotation sample produced 1.4 grams of charcoal. A wood charcoal sample returned a radiocarbon date of  $1160 \pm 40$  B.P. Although no reddening of the soil was noted, the shape and size suggest a small earth oven. However, the feature may have been used for other purposes such as heat-treating lithic materials.

### *Historic Artifacts*

A substantial assemblage of historic artifacts was recovered from the Phase II and III excavations at the site. Historic maps dating to 1868 and 1905 show the presence of a residence or farmstead in the vicinity of Site 7NC-E-152 (Figures 5.13 and 5.14). However, no foundations or other physical evidence of structures were identified during the fieldwork. The buildings were likely destroyed during the construction of Churchman's Road. In all, 1,161 historic artifacts were recovered (Table A.11).

Historic ceramics number 572, over half of which ( $n=311$ ) are chronologically non-diagnostic redware and whiteware. Ceramics that can definitely be attributed to the nineteenth century or earlier number 230 and include creamware, pearlware, and red-bodied slipware. Dates of these types range from as early as 1670 to 1890. The mean ceramic date of the datable ceramic

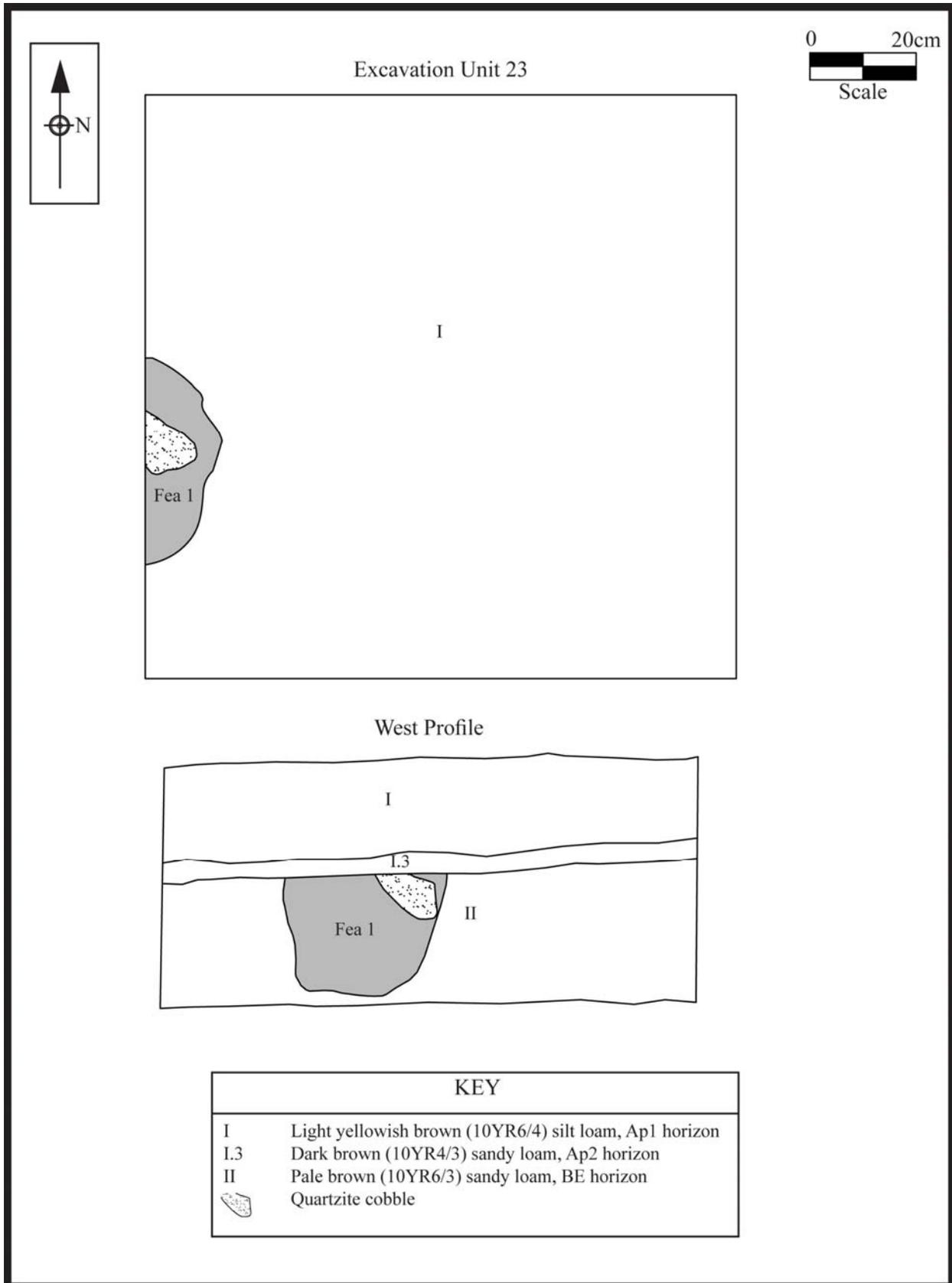


Figure 5.10 Feature 1, plan and profile.

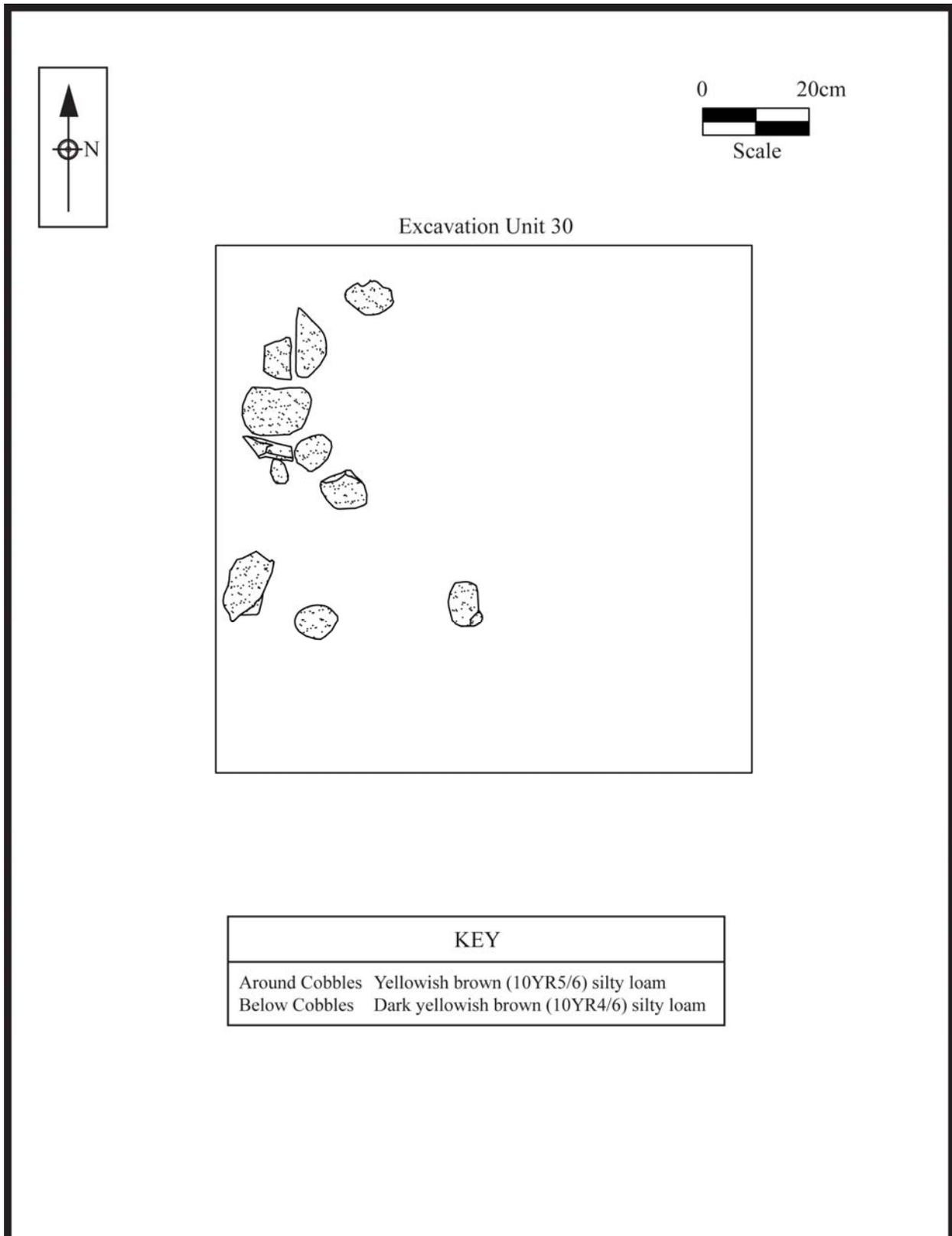


Figure 5.11 Feature 3, plan view.

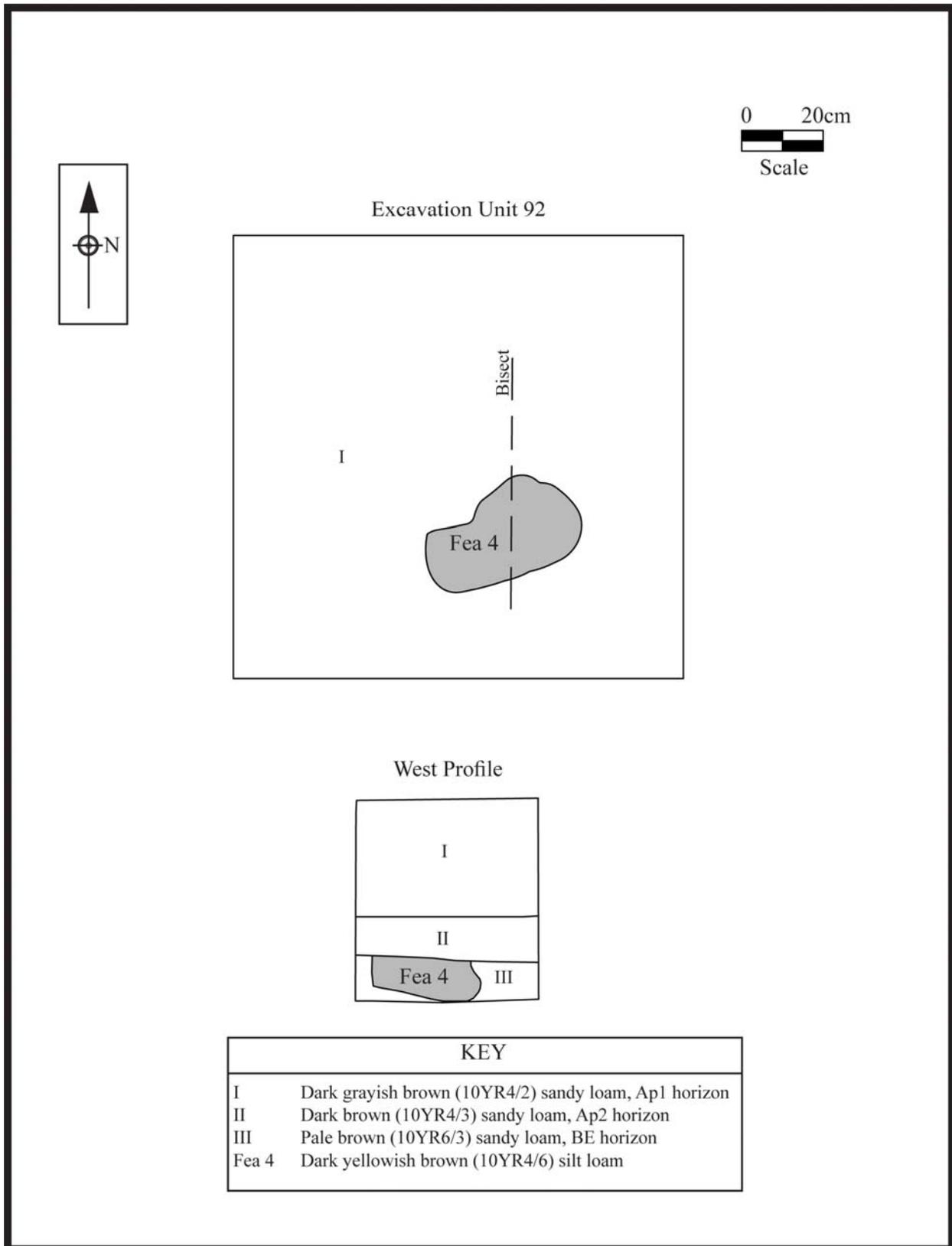


Figure 5.12 Feature 4, plan and profile.



Figure 5.13 Vicinity of the project area in 1868 (Beers 1868).

Figure 5.14 Vicinity of the project area in 1905 (USGS 1905).



assemblage is 1816. Other domestic items include bottle glass, lamp parts, tumbler and tableware glass, and two kaolin pipe stems.

Personal items include two fragments of a small, handheld mirror, six pieces of mirror glass, and a silver brooch found in Cluster 3, as well as two kaolin pipe stem fragments and a button found in Cluster 4. The pipe stems date from the late eighteenth to early nineteenth centuries.

The brooch is a sixteenth-century white metal artifact, most likely silver, consisting of a ring with an attached, moveable tongue (Figure 5.15). The diameter of the specimen is 17.18 millimeters (0.7 inches). Diagonal etching in a symmetrical pattern occurs across the front side of the artifact. Brooches of this style were fastened to cloth or hair as ornaments; they were commonly dispersed in trade and have been documented as grave goods (Becker 1992; Kent 1984). The silver brooch represents the only Contact period artifact of European manufacture in the assemblage.

The mirror has a maximum length/width of 12.34 x 6.48 centimeters (4.86 x 2.55 inches) (Figure 5.16). The frame consists of a symmetrical design supporting a small, round mirror glass piece. The metal composition of the frame is a lead/tin alloy. Experts consulted provided differing information on the age of the mirror. One placed the artifact in the mid- to late eighteenth century (Dr. Diana Loren, personal communication 2010). Another indicated that the mirror glass appeared to be composed of a traditional soda-lime glass used during the Victorian period (Dr. William Lanford, personal communication 2010). Despite extensive consultation and Internet research, the exact age of the mirror was not determined.

Architectural materials number 428 and include nails, brick, spikes, and window glass, likely resulting from destruction of the residence. Miscellaneous other artifacts include hardware, unidentifiable metal, gunflints, a shotgun shell, and a piece of plastic.

Overall, the artifacts comprise a late-eighteenth-to-early-nineteenth-century assemblage and suggest that the earliest occupation of the farmstead significantly predated the 1868 atlas map. The density of historic artifacts was highest in Cluster 4 (11.7 per EU) and Cluster 5 (10.8 per EU), both of which were immediately adjacent to the road. Over half of the Cluster 5 artifacts are nails. The pipe stems and all but seven of the eighteenth-to-nineteenth-century ceramics were found in Cluster 4, as was 74% of the architectural material. Because no foundations are extant, it is not possible to identify the context of the artifacts relative to middens or yard areas. Alternatively, the artifacts could have been dumped in this location during construction of Churchman's Road.

## **SPATIAL ANALYSIS**

The primary disturbance to Site 7NC-E-152 was plowing. As discussed in the section on site formation and intrasite patterning above, plowing affects the distribution of artifacts and can partially destroy subsurface features, but plowing does not completely destroy archaeological patterning. Thus, the five artifact clusters identified at the site could represent temporally specific activity loci. Given the multicomponent nature of the site, however, the clusters could simply represent areas of overlap of individual camps. Spatial analysis of the artifact distributions was conducted to determine whether temporally specific activity areas could be defined.



Figure 5.15 Silver brooch. Cat no. 53C.1, EU 14, Stratum 1, Cluster 3.



Figure 5.16 Hand mirror and glass. Cat nos. 352D.1 and 352D.2, EU 44, Stratum 1, Cluster 3.

Field excavations were conducted in relatively small horizontal units (50 x 50 centimeters [1.6 x 1.6 feet]) to facilitate spatial analysis of vertical and horizontal artifact distributions. The plowzone of the EUs was excavated in 10-centimeter (3.9-inch) levels, generally resulting in two complete and one partial level. Considering only the two complete levels, approximately 77% of the artifacts were in the upper level and the remaining 23% were in the lower level. Artifact densities were lower in the undisturbed subsoil and decreased rapidly with depth. These findings support the conclusion that prehistoric occupations originally occurred at the surface and that some artifacts associated with these occupations were transported downward through the profile via trampling, plowing, and bioturbation.

Somewhat surprisingly, artifact distributions from the plowzone and subsoil of Cluster 1 are not similar, as might be expected when artifacts move downward through bioturbation (Figures 5.17 and 5.18). However, the presence of the mended point fragments in both strata of the same EU supports the conclusion that the subplowzone artifacts were deposited as a result of soil disturbance. Two clusters of five pieces of FCR each were identified in the plowzone, possibly representing cultural features, such as shallow hearths or FCR dumps destroyed via plowing.

As with Cluster 1, artifact distributions from the subsoil of Clusters 3 and 4 differ somewhat from those of the plowzone (Figures 5.19–5.22). The highest density of FCR in Cluster 3 was a single large rock weighing 2.1 kilograms. A cluster of FCR in the subsoil of the northwest portion of the Cluster 4 block (EU 101) could represent a latent pit feature with no visible organic stain.

Experiments to assess the effects on horizontal distributions indicate that plowing can enlarge or elongate artifact clusters (Lewarch and O'Brien 1981; Odell and Cowan 1987; Trubowitz 1978). Clusters 2 and 3 appeared somewhat elongated horizontally in the likely direction of plowing (see Figure 4.1). Cluster 1 appeared to follow the topography. Cluster 4 did not seem to have been elongated by plowing.

Artifacts associated with each cluster and their distributions are discussed below. Because the artifacts from the subsoil are interpreted as having moved downward from the surface through post-depositional processes, the artifacts from all excavation levels are mapped and discussed together.

### *Cluster 1*

Phase II and III EUs in Cluster 1 (including EUs outside the Phase III APE) produced 58 pieces of FCR, 23 cobble tools, 585 other lithic artifacts, and seven ceramic sherds (Table A.12). Quartz, including rose quartz and quartz crystal, comprises over half of the lithic materials. Chert, jasper, and quartzite are also well-represented. Chipped stone tools include points and point fragments, scrapers, and a spokeshave. Sixteen hammerstones, four bifaces, and 24 cores and tested cobbles reveal the importance of lithic reduction in this locality.

The assemblage of artifacts from the EUs within the Phase III APE includes 49 pieces of FCR, 22 cobble tools, 501 other lithic artifacts, and all seven of the ceramic sherds (Table A.13). Of these artifacts, 44 pieces of FCR, 449 other lithic artifacts, and four ceramics sherds were found

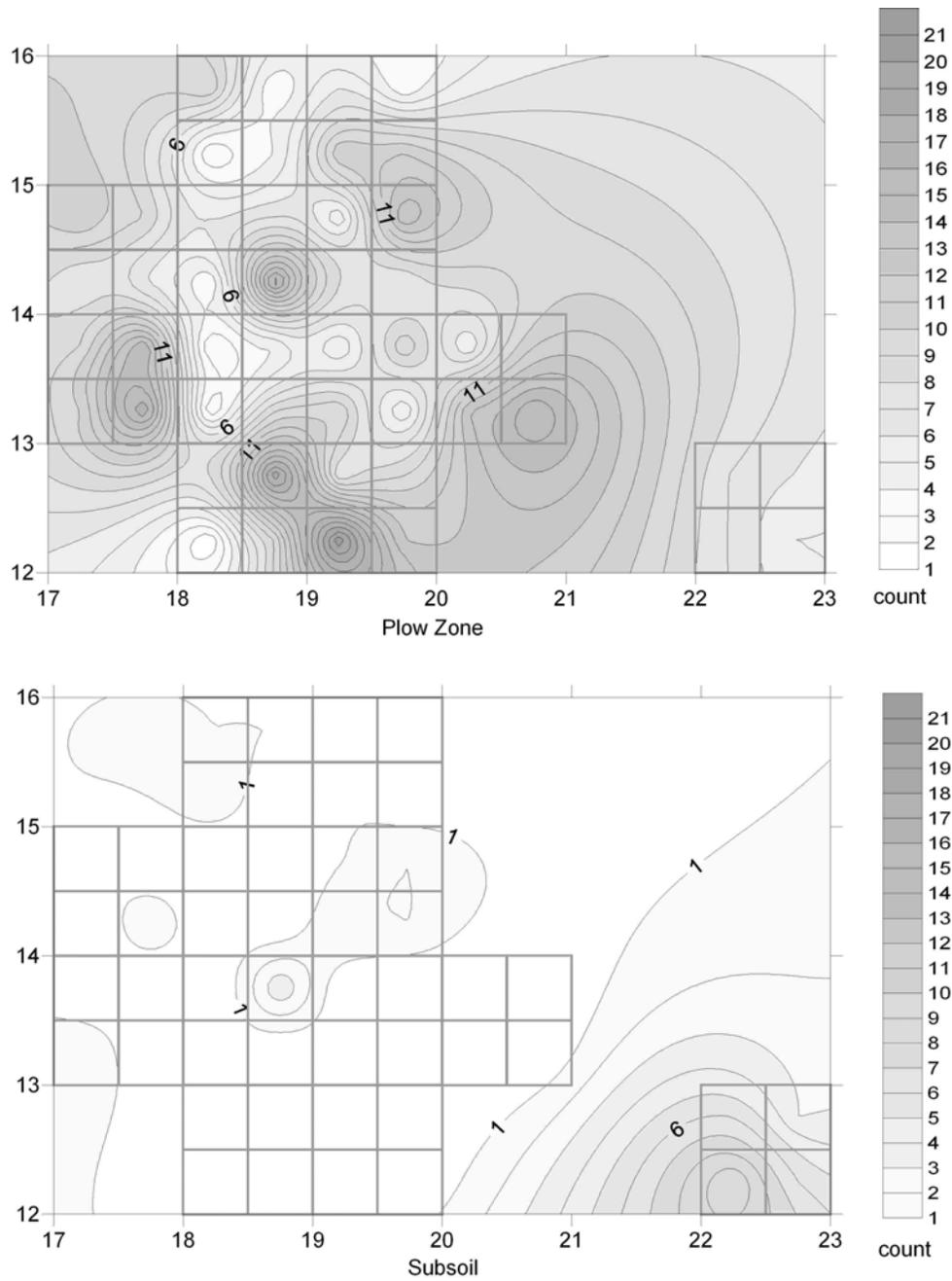


Figure 5.17 Distributions of debris, Cluster 1 plowzone and subsoil.

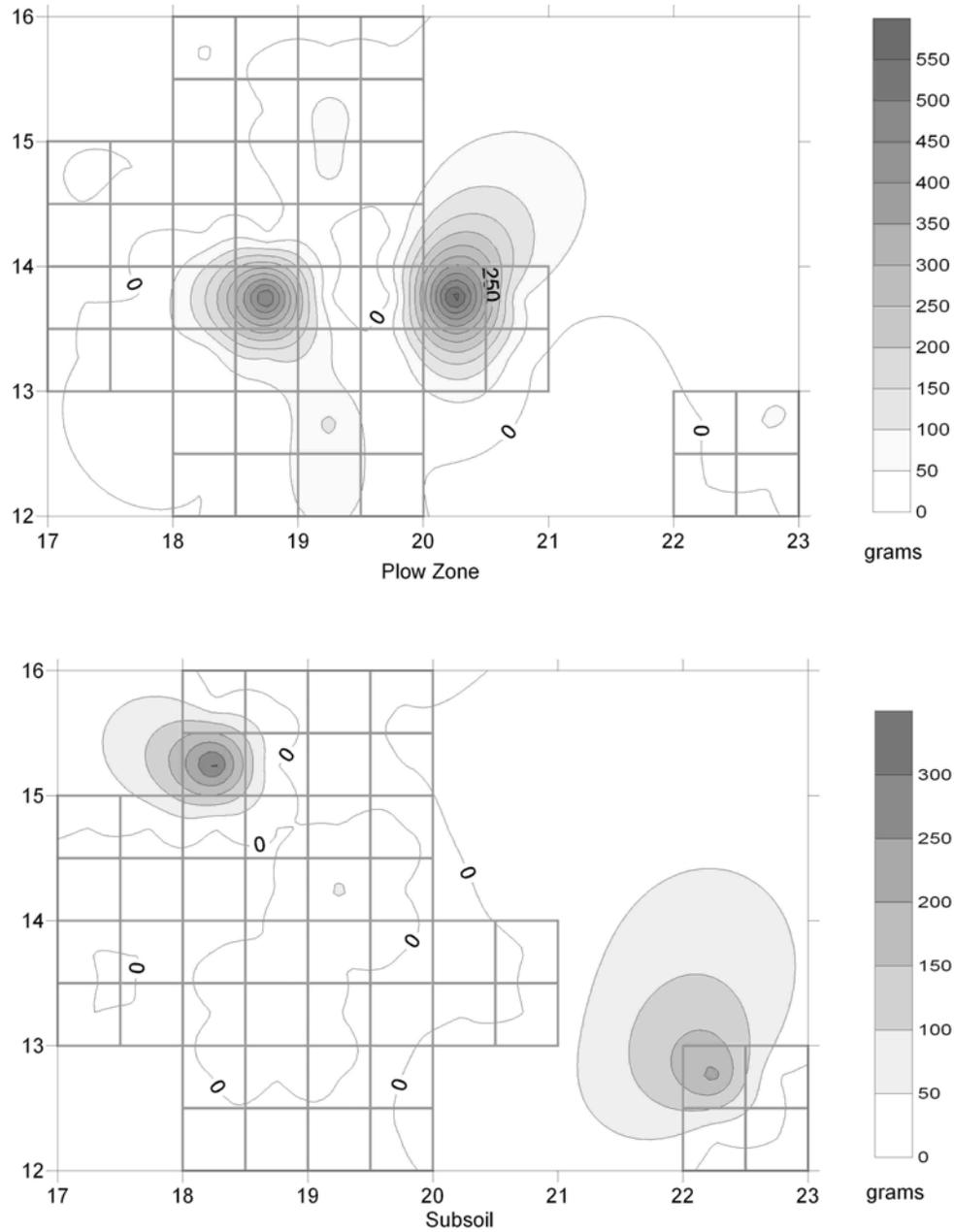


Figure 5.18 Distributions of fire-cracked rock, Cluster 1 plowzone and subsoil.

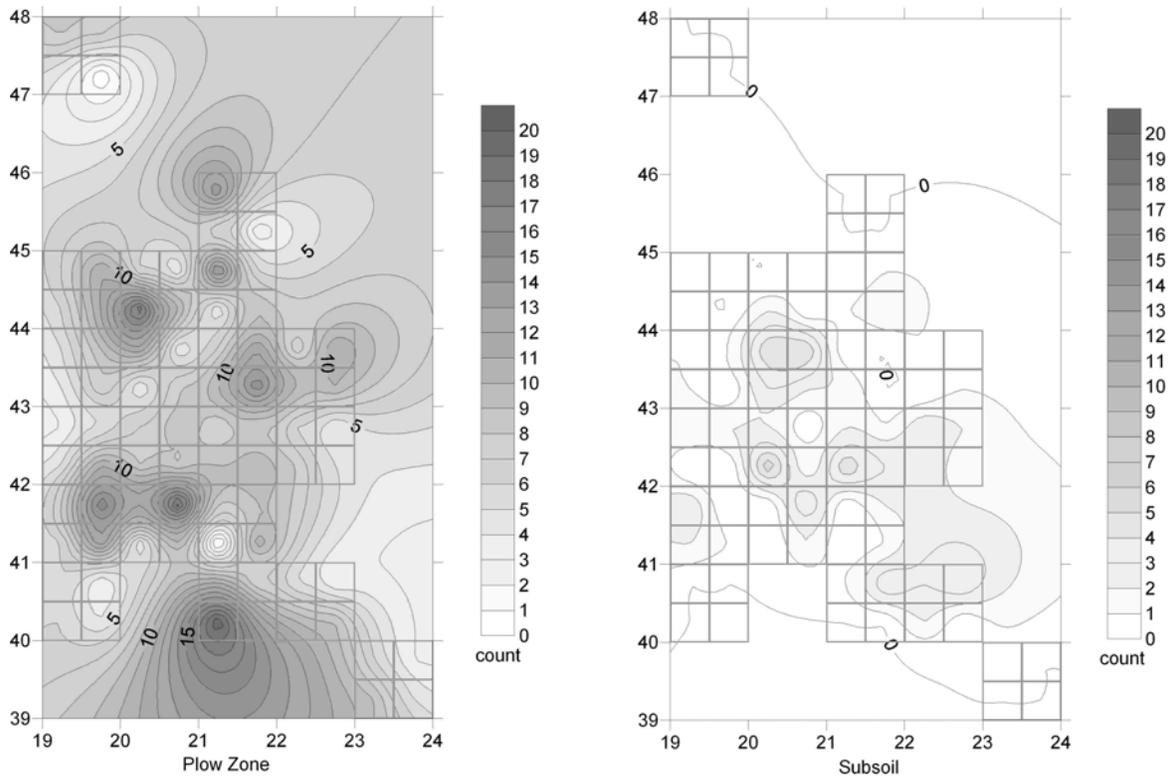


Figure 5.19 Distributions of debitage, Cluster 3 plowzone and subsoil.

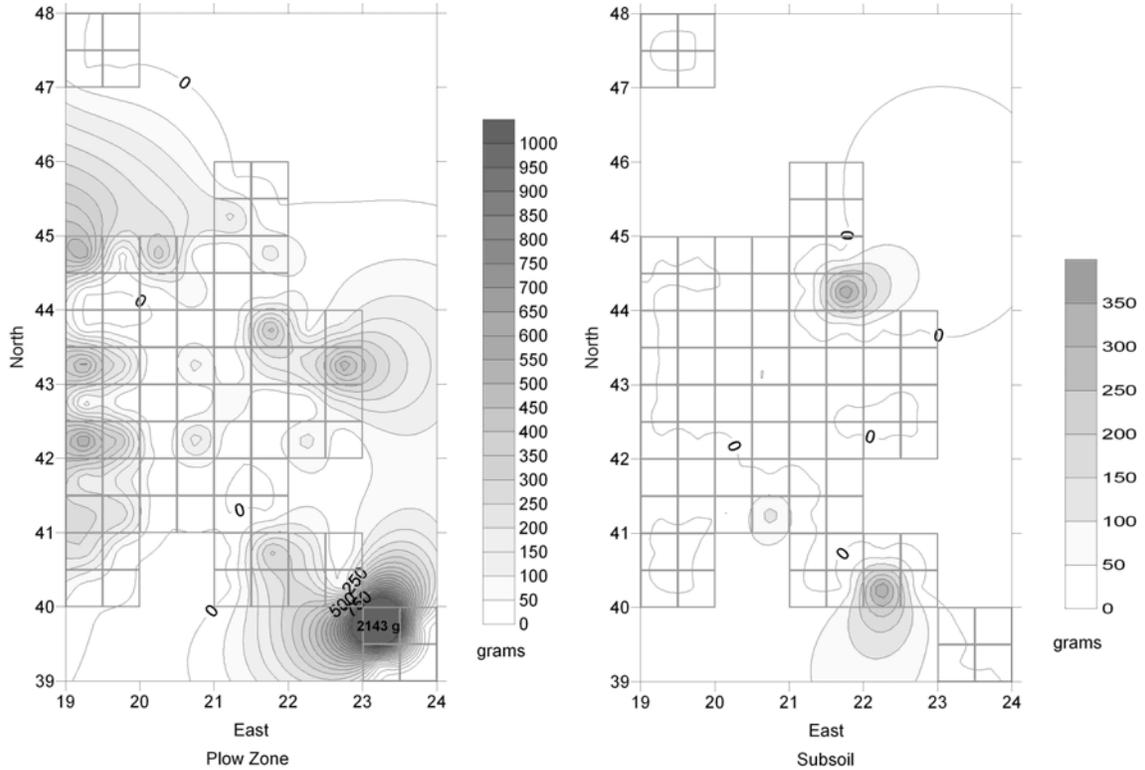


Figure 5.20 Distributions of fire-cracked rock, Cluster 3 plowzone and subsoil.

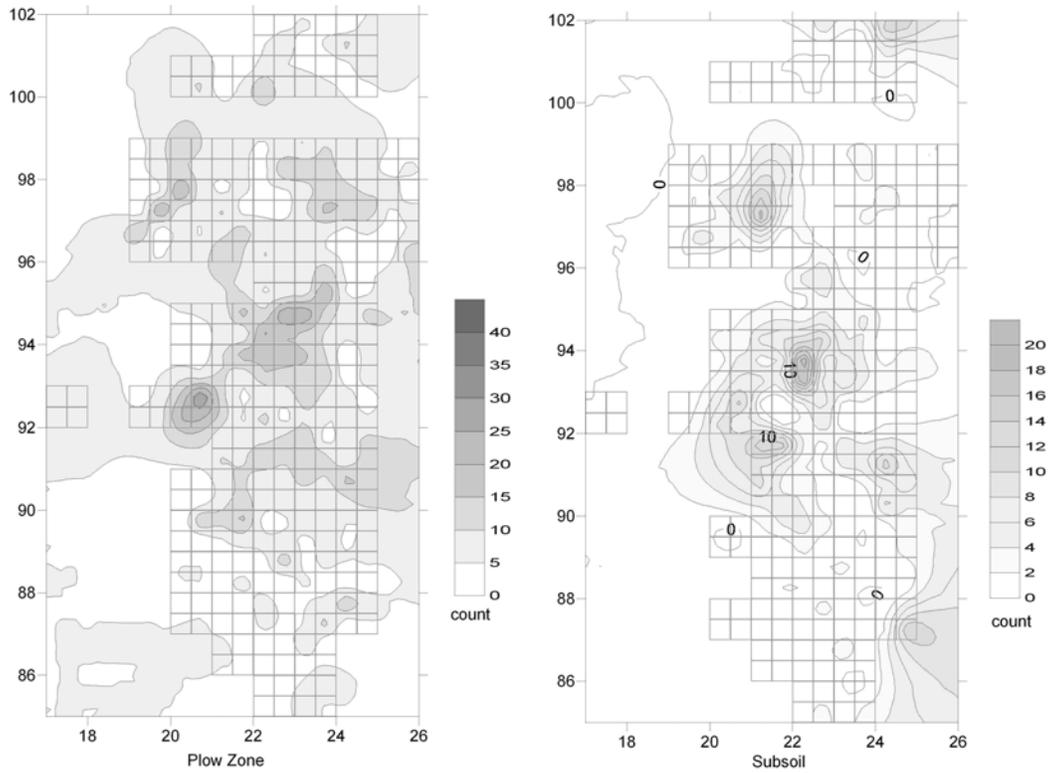


Figure 5.21 Distributions of debris, Cluster 4 plowzone and subsoil.

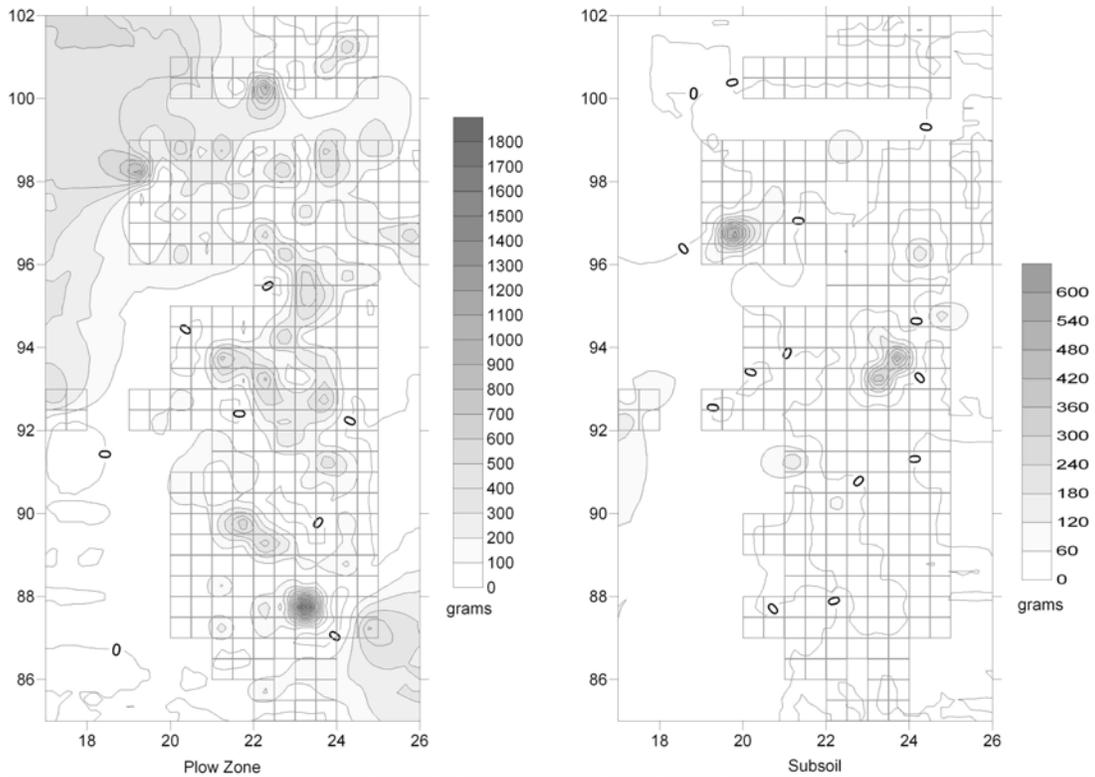


Figure 5.22 Distributions of fire-cracked rock, Cluster 4 plowzone and subsoil.

in the plowzone. The remaining artifacts were in the subsoil, all but four of which were in the uppermost subsoil level.

Quartz types comprise 51.9% of the chipped stone assemblage. Columbia Formation chert (18.7%) is well represented, with quartzite and red and yellow/brown jaspers also present. Black chert, chalcedony, and jasper from the Delaware Chalcedony Complex comprise only 3.4% of the assemblage. Cryptocrystalline quartz materials, including jasper, chalcedony, and cherts, comprise 40.7% of the assemblage. No argillite and only two pieces of rhyolite were recovered in Cluster 1.

The ceramics are plain body sherds tempered with quartz and sand (see Figure 5.9, Cat nos. 298A, 478B.2, and 545A.1). With the exception of parallel incised lines on one sherd, no decoration is present. As discussed above, this sherd is classifiable as Minguannan. The sherds were found in the plowzone and subsoil in three scattered locations, all of which had relatively low lithic artifact densities.

Biface-thinning flakes, representing the late stages of reduction, comprise 41.5% of the flakes, but only one of the four identifiable bifaces is late stage. The proportion of decortication flakes is relatively high at 26.9%.

The seven points or point fragments in Cluster 1 represent five individual points. Three fragments are fashioned from a white chert and mended to form part of a straight-stemmed point. The three fragments were found in the same 50-x-50-centimeter (1.6-x-1.6-foot) EU, one in the plowzone and two in the subsoil. The other points were found in the plowzone and include a triangular point of chert (see Figure 5.3, Cat no. 33A.1), a Brewerton side-notched point of jasper (see Figure 5.4, Cat no. 476C.17), a Fox Creek lanceolate point of argillite (see Figure 5.2, Cat no. 469D.1, and a small point tip. The points suggest a number of Woodland I occupations spanning the entire period. Although the triangular point could be Archaic or Woodland I, given the presence of Late Woodland ceramics, it is likely that the triangular point is also Late Woodland in age.

Other tools found within the Phase III APE include four endscrapers (see Figure 5.6, Cat no. 77C.6, a bifacial knife (see Figure 5.7, Cat no. 476C.18, four utilized flakes (see Figure 5.8, Cat no. 493A.1), a spokeshave, hammerstones, and four unidentifiable cobble/pebble tools. An anvil was found, but no bipolar flakes or cores were identified.

Seven tools were screened for microwear, six of which proved positive and were examined under high power magnification to interpret microwear. Included are three points, a scraper, the bifacial knife, and a retouched flake. A triangular point of chert has a macro-impact fracture and evidence of use for butchery (Table A.14). A Brewerton side-notched and a bifacial knife exhibit no impact fractures, but show evidence of use for butchery. The straight-stemmed point has hafting traces but no other evidence of use. The scraper comes from Phase II EU19, located outside the Phase III block excavation. It was hafted and used for planing wood. The retouched flake was also hafted, but was used for cutting meat.

FCR numbers 49 and comprises a total weight of 2.8 kilograms. The average weight of FCR is 57.8 grams and ranged from 0.38 to 219 grams.

Only seven artifacts other than FCR show evidence of heat treatment. They include a quartzite hammerstone and debitage from all stages of lithic reduction. Heat-treated materials include jasper, chert, quartzite, and rhyolite.

Debitage densities ranged from 1 to 21 per 50-x-50-centimeter (1.6-x-1.6-foot) quadrat. The distribution revealed several tight clusters generally covering only one or two 50-x-50-centimeter quadrats each (Figure 5.23). Heat-treated artifacts were scattered throughout Cluster 1, including EUs and STPs outside the Phase III APE. FCR numbers from 1 to 5 per quadrat. Distribution by weight revealed four concentrations of FCR, located primarily in areas of low debitage density (see Figure 5.23).

None of the debitage clusters represent reduction of a specific lithic material. Quartz, which comprises most of the debitage, reveals a distribution similar to that of all debitage, as did the distribution of all material types available from the Columbia Formation cobbles. Cryptocrystalline quartz—such as chert and jasper—has only a slightly different distribution (Figure 5.24). The few artifacts from the Delaware Chalcedony Complex (Iron Hill jasper, Cecil County Black Flint, and chalcedony) were not concentrated, but were sparsely distributed across the block. Overall, the distributions indicate that there was no spatial segregation of manufacturing activities by lithic material type.

Cores, tested cobbles, and bifaces were largely concentrated in the center of the Cluster 1 block excavation, where debitage densities were relatively low (Figure 5.25). The hammerstones were more widely distributed throughout the block. The three anvil stones were associated with the highest densities of cores and bifaces. No other evidence of bipolar technology was found in Cluster 1.

The distribution of biface-thinning flakes was generally similar to the distribution of decortication flakes, indicating that there was no spatial segregation of manufacturing activities by lithic reduction stage (Figure 5.26). Tested cobbles and bifaces exhibit no spatial association with either flake type. The five finishing flakes were found in one location, although lithic materials for the flakes include both quartz and jasper, likely from gravel sources.

The points, scrapers, and spokeshaves were distributed throughout the block, as were the utilized flakes and cobble/pebble tools (Figure 5.27). Butchering appears to take place primarily in the northeastern portion of the block. No other functionally specific activity areas were identified.

Overall, the primary activities associated with Cluster 1 are butchering and lithic manufacturing. The spokeshave and scraper indicate that woodworking was also performed, most likely to fashion hafts for points or other tools. The presence of FCR indicates that shallow hearths may have been present but were destroyed via plowing. However, the small number of thermally altered artifacts suggests that at least some hearths were used for tasks other than heat treatment. Material from the Delaware Chalcedony Complex comprises only 3.4% of the assemblage, and very little rhyolite or argillite was present. Thus, the focus of tool production was on materials available from cobble sources nearby.

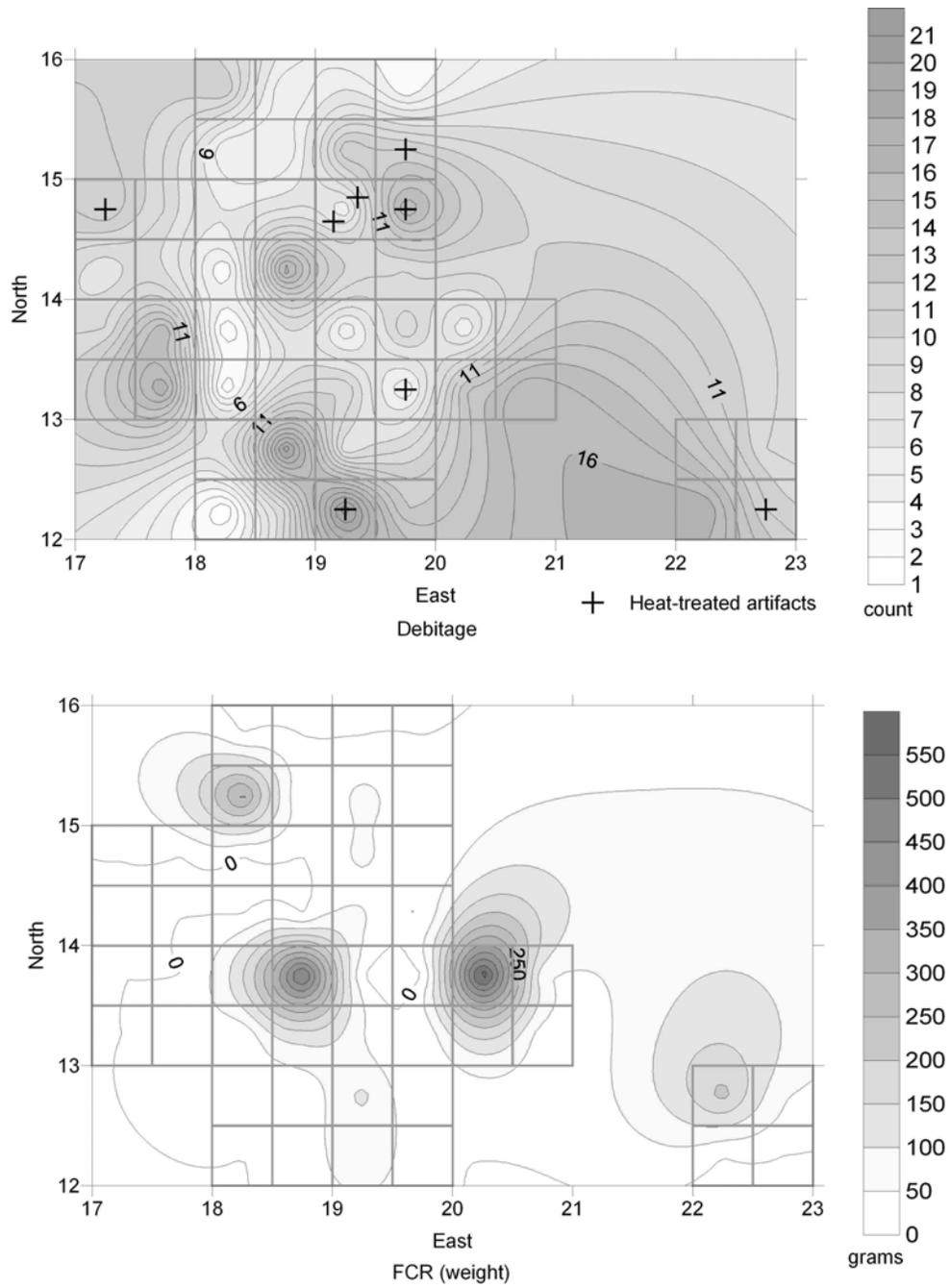


Figure 5.23 Distributions of debitage and FCR, Cluster 1.

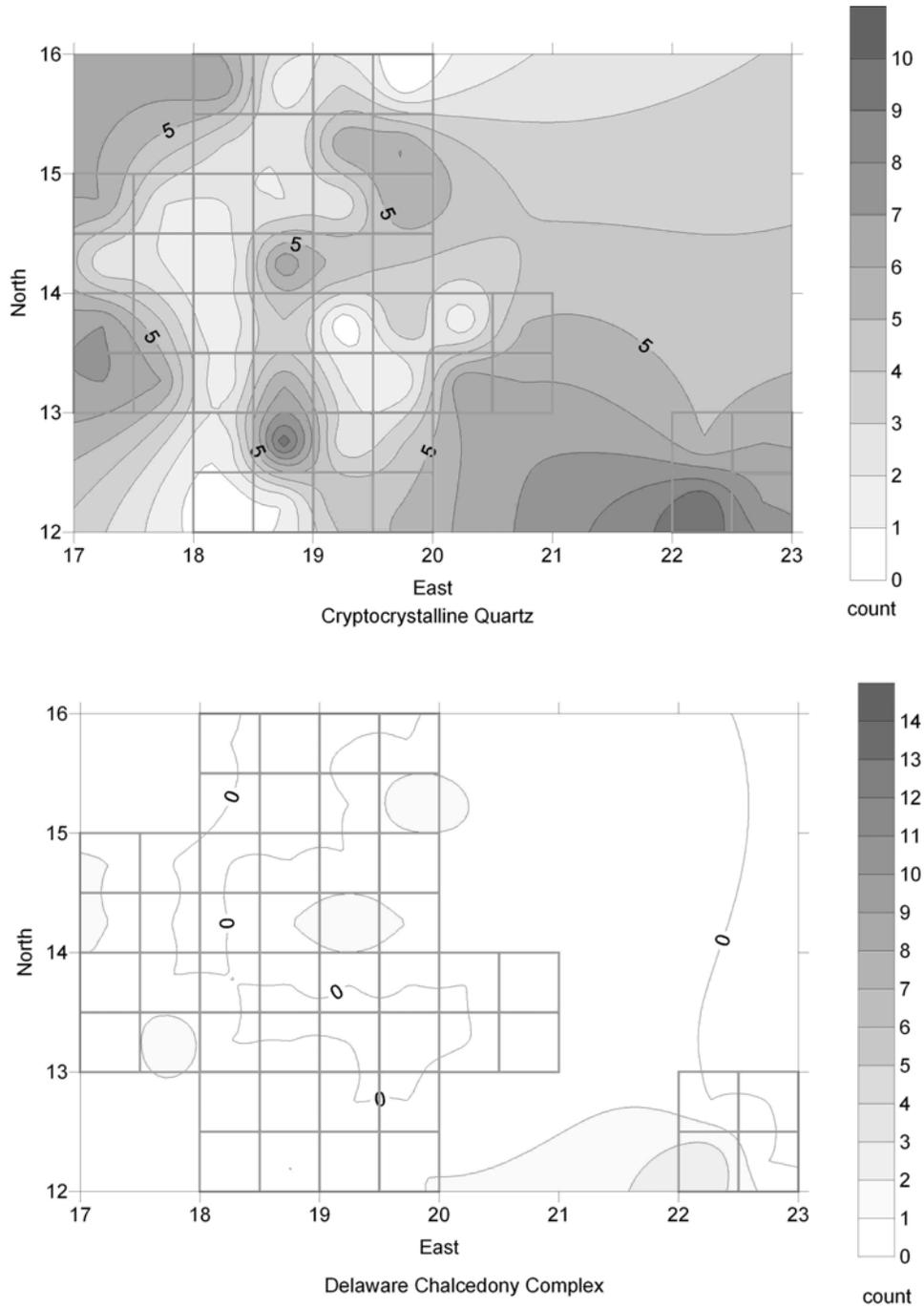


Figure 5.24 Distributions of debitage by material type, Cluster 1.

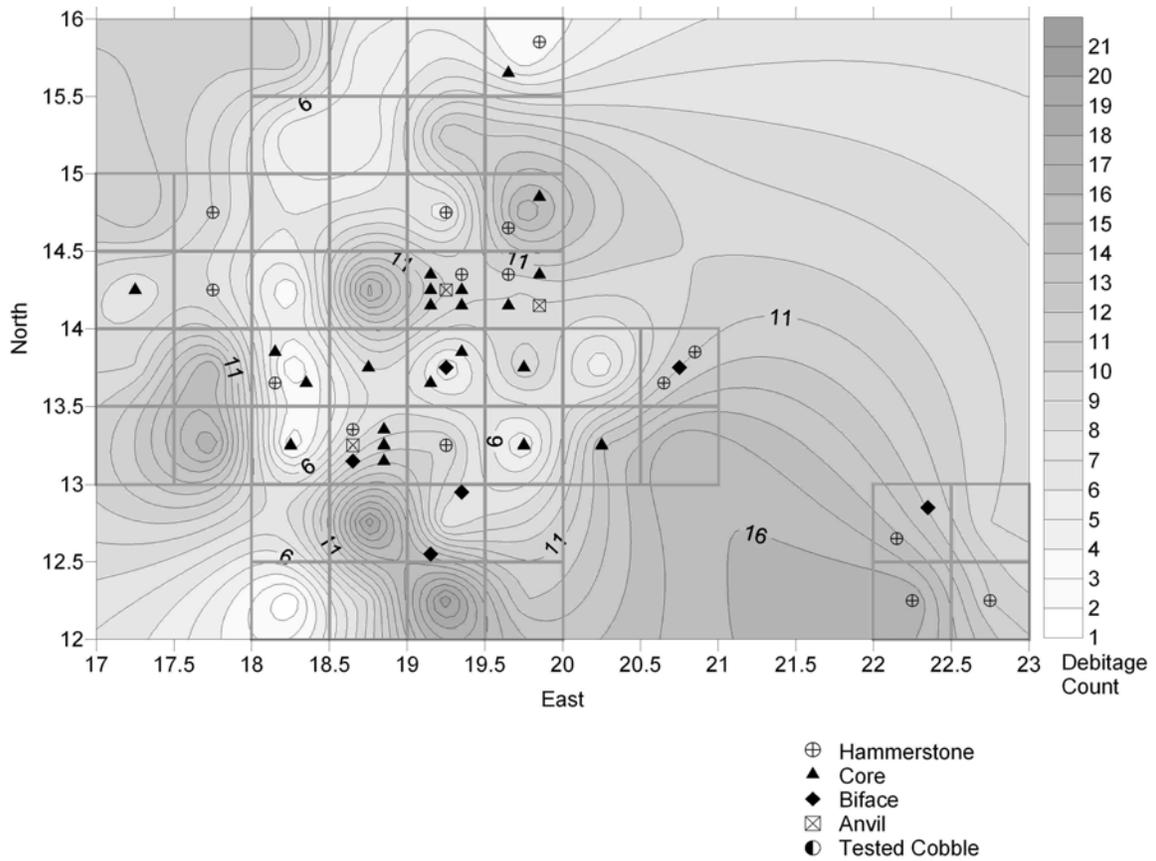


Figure 5.25 Distribution of hammerstones, bifaces, cores, and tested cobbles, Cluster 1

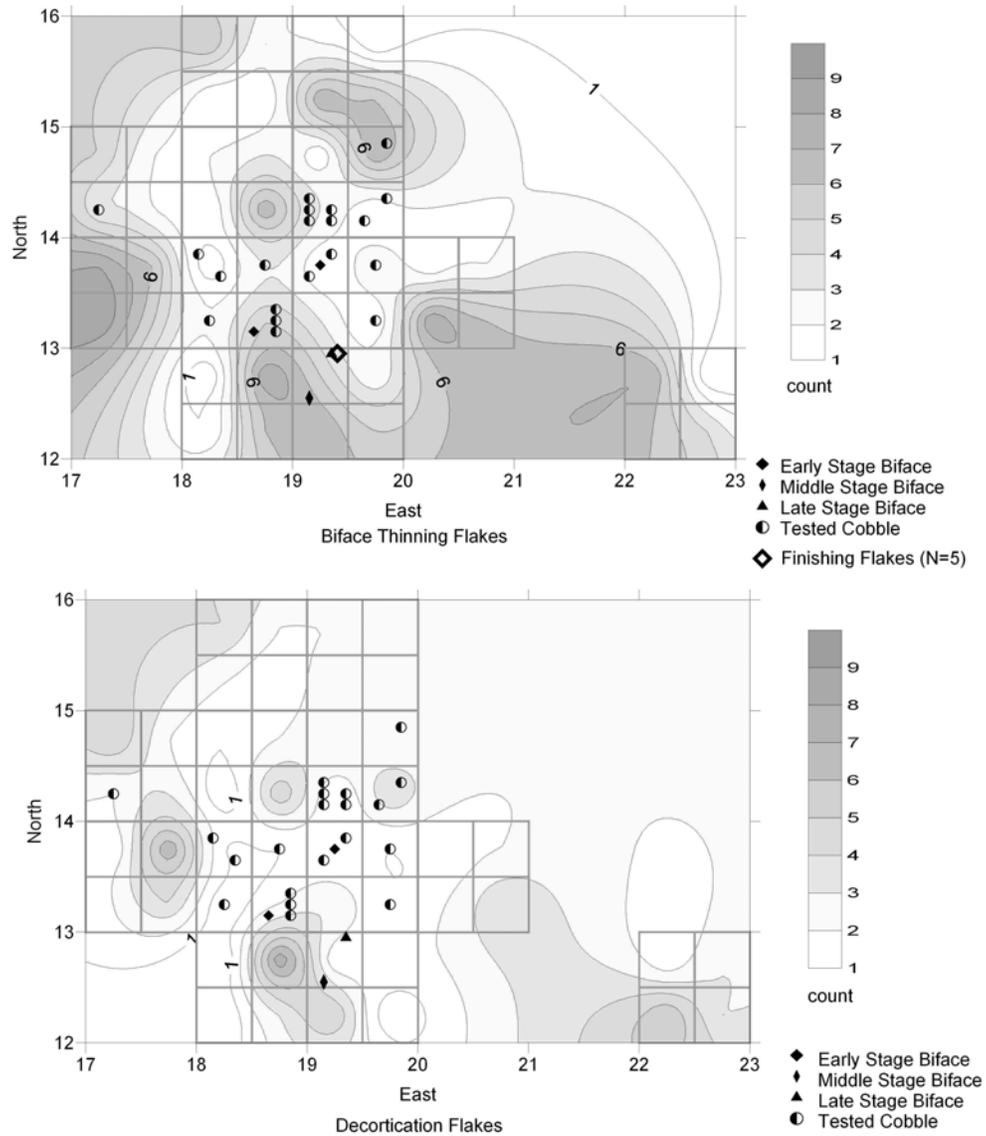


Figure 5.26 Distribution of lithic reduction artifact types, Cluster 1.

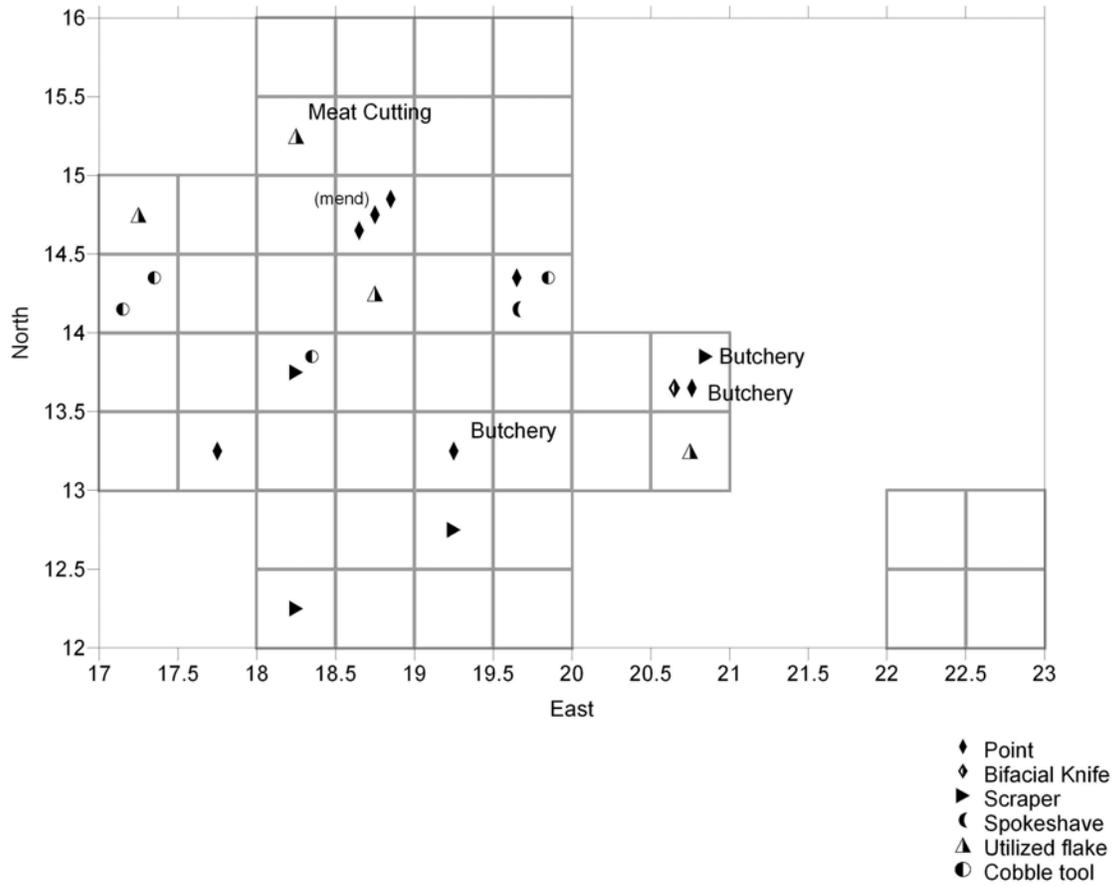


Figure 5.27 Distribution of tools, Cluster 1.

### *Cluster 2*

Cluster 2 was located along the western edge of the Phase II APE on terrain that sloped gently downward to the Christina River. Because Cluster 2 was entirely outside the Phase III APE, the only excavations there consisted of five Phase II units. The excavations produced nine pieces of FCR (679.8 grams), three hammerstones, and 126 other lithic artifacts from the plowzone and subsoil combined.

The artifacts include a late-stage biface of quartz crystal, two tested quartzite cobbles, three hammerstones, and 123 pieces of debitage. No ceramics, tools, or chronologically diagnostic artifacts were found. The only activity reflected in the Cluster 2 assemblage is lithic manufacturing using biface-reduction techniques.

Lithic materials include the various quartz types and quartzite, which together comprise over 89% of the assemblage and suggest the use of local cobble sources. Cryptocrystalline quartz comprises only 9.5% of the lithics, a significantly lower proportion than in other clusters. Only two flakes from the Delaware Chalcedony Complex were found, and no rhyolite or argillite was recovered. Decortication comprises over 29.7% of the debitage, and biface-thinning flakes only 23.8%, indicating that the early stages of lithic reduction predominated in this area.

Feature 1, a shallow pit of unknown function, was found in EU 23. Artifacts found in the feature fill include a tested cobble of quartzite and two pieces of quartz shatter. Artifacts from EU 23 and in nearby EU 15 consist of debitage from a variety of lithic materials, hammerstones, and a late-stage biface of quartz crystal. Only one piece of debitage, a decortication flake of quartzite, shows evidence of heat treatment. Four pieces of fire-cracked quartzite were present, three in EU 15 and one in EU 23. Feature 1 could conceivably have been used for heat treating quartzite cobbles. Given the absence of soil reddening and charcoal in the pit, however, it is more likely that the thermal alteration of the artifacts took place in a hearth located outside the EUs.

Because no block excavation was completed within Cluster 2, mapping of artifact distributions was not undertaken.

The absence of tools and the relatively low artifact density indicate that the area of the site encompassing Cluster 2 represented either a lithic reduction area or secondary discard from cleanup of other areas of the site. The age and function of Feature 1 could not be determined.

### *Cluster 3*

Nearly all of Cluster 3 was within the Phase III APE. Phase II and III excavations produced 109 pieces of FCR (0.3 kilograms), 33 groundstone artifacts, and 843 chipped stone artifacts (Table A.15). No prehistoric ceramic artifacts were found. Most of the assemblage comes from the plowzone. Only six pieces of FCR and 108 other lithic artifacts were found in the upper level of the subsoil, one piece of FCR and 20 other artifacts in the second level, and only one flake in the third level.

Groundstone artifacts include an anvil stone, 31 hammerstones, and a large, pitted grinding stone classified as a metate. FCR consists primarily of quartzite and sandstone. The average weight of the FCR fragments is 103.8 grams, and the range was from 5 to 506.4 grams, with one additional large piece weighing 2.1 kilograms.

Quartz varieties, including quartz crystal and rose quartz, predominate in the chipped stone assemblage (73.1%), with chert, quartzite, and jasper representing most of the remaining artifacts. Material from the Delaware Chalcedony Complex comprises only 3.6% of the lithics. The proportion of cryptocrystalline quartz in the assemblage is 19.1%. Only four pieces of non-local rhyolite and none of argillite were present. Overall, the lithics indicate a heavy reliance on materials from the Columbia Formation gravels. Three hammerstones, a core, a late-stage biface, and nine pieces of debitage—including quartz, chert, quartzite, and jasper—show evidence of heat-treatment.

Twelve of the 17 bifaces are late stage and 55.7% of the debitage consists of biface-thinning flakes, indicating that the late stages of biface reduction predominated in this area of the site. The large number of hammerstones indicates that tool manufacturing was a significant activity at this location. The presence of two bipolar flakes and an anvil stone indicate the limited use of bipolar technology. No bipolar cores were found.

Only two points were found in Cluster 3, including a St. Albans point of chert (see Figure 5.5, Cat no. 474B.8), representing an Archaic period occupation, and an unidentifiable point fragment of quartz crystal. Other tools include 10 scrapers (see Figure 5.6, Cat no. 459D.1) and 12 utilized flakes. Microwear analysis of the St. Albans point indicates that it had been used for butchery (see Table A.14). The point also has a macro-impact fracture and hafting traces. Three scrapers were examined. One scraper shows evidence of use for cutting meat and one has hafting traces and evidence of use on an indeterminate material. The third scraper has hafting traces, but no evidence of use. A retouched flake was used for woodworking, possibly for the creation of hafts or spear shafts.

The distribution of debitage from the plowzone and subsoil combined revealed a number of small concentrations distributed across the excavation block (Figure 5.28). Densities range from 0 to 42 artifacts per 50-x-50-centimeter (1.6-x-1.6-foot) quadrat. Heat-treated artifacts were not concentrated in any one area, but instead were scattered across the block. FCR was distributed around the edges of the excavation block, where debitage densities were relatively low. FCR had a very high density by weight in EU 84, where a single large piece weighing 2.1 kilograms was found in the plowzone (see Figure 5.28).

Quartz, the most abundant material, ranged in density from 0 to 19 pieces of debitage per 50-x-50-centimeter quadrat. Because of its abundance, the distribution of quartz reflected that of debitage as a whole. Cobble materials from Columbia Formation gravels, predominately quartz, also had a similar distribution. Cryptocrystalline quartz had densities of 0 to 9 per quadrat and had high densities in the north and center of the block (Figure 5.29). Delaware Chalcedony Complex material, all of which consists of cryptocrystalline quartz, had a similar distribution and was negatively associated with materials from cobble sources. However, none of the materials were sufficiently clustered or abundant to be interpreted as representing lithic-reduction activity

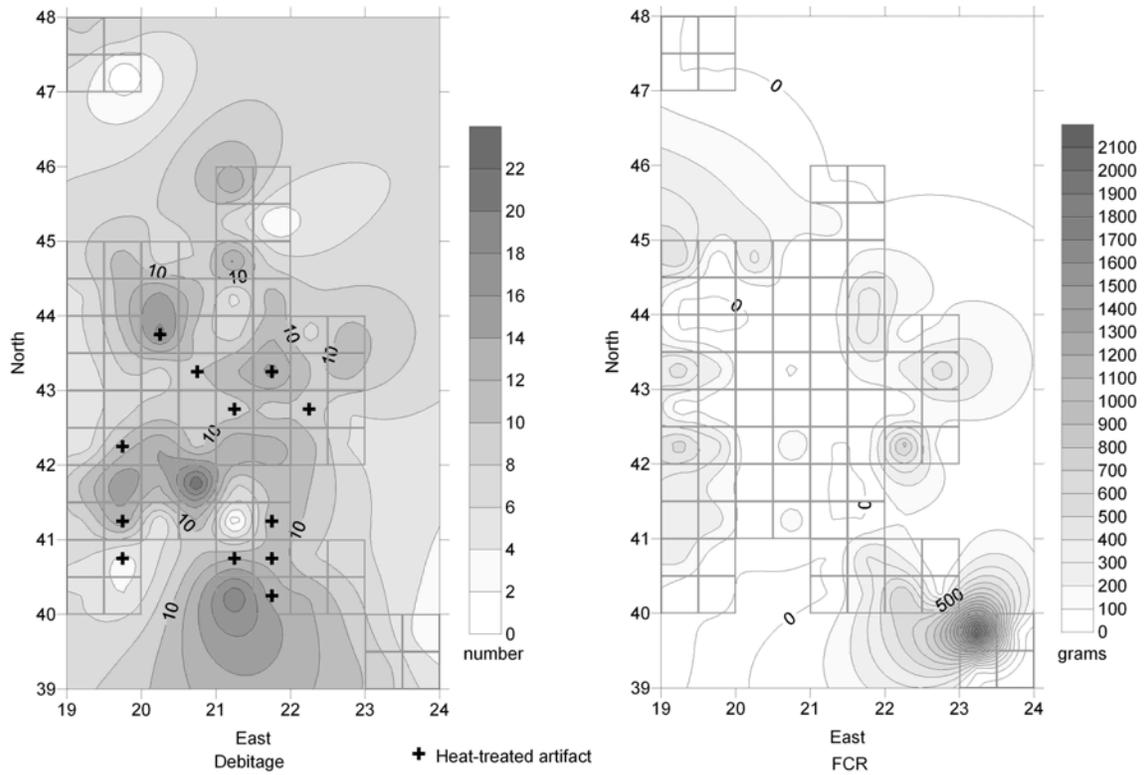


Figure 5.28 Distribution of debitage and FCR, Cluster 3.

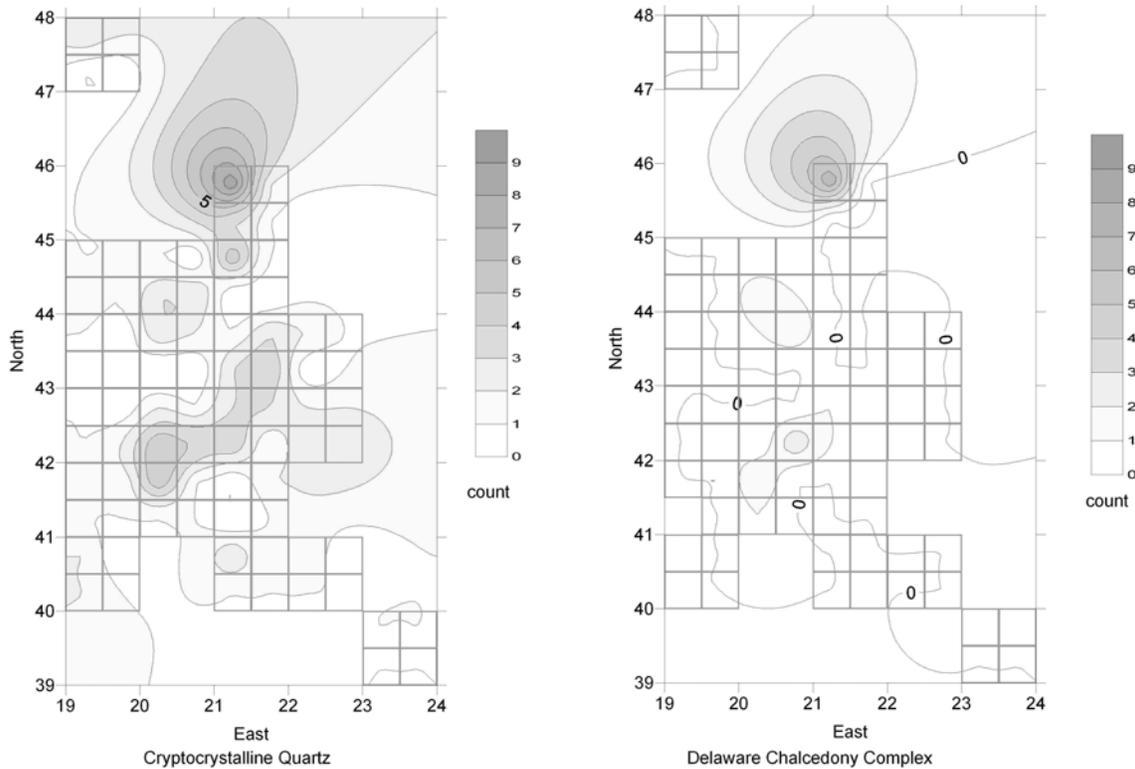


Figure 5.29 Distribution of debitage by material type, Cluster 3.

loci. Although bifaces were associated with several of the higher density areas, none were of the same material.

Artifacts related to tool manufacturing were at their highest densities in the center of the excavation block (Figure 5.30). Unlike Cluster 1, the distribution was similar to that of the debitage. The area between N41 and N42 and west of E21 was a location of intensive lithic reduction activity. An anvil stone was recovered from this area, but the two bipolar flakes in Cluster 3 were found farther to the north.

There was an apparent negative relationship between tested cobbles and decortication flakes, with the former artifact type primarily in the western portion of the block and the latter in the east (Figure 5.31). Biface-thinning flakes were distributed in three clusters, possibly representing tool finishing or resharpening activity areas. Bifaces, most of which are late stage, are associated with biface-thinning flakes. The finishing flakes were distributed across the block.

Other tools in Cluster 3 were found in small clusters, located primarily near the center of the excavation block (Figure 5.32). Based on microwear analysis, there appears to have been spatial segregation between game processing and woodworking activities. Four tool clusters were present, two for butchering, one for woodworking, and one unknown.

In summary, the St. Albans point and absence of ceramics indicate that Cluster 3 represented an Archaic period occupation of the site, although other occupations may also have been present. Butchering and lithic manufacturing were the primary activities represented in Cluster 3. Lithic manufacturing was skewed to the late stages of reduction and included the use of bipolar technology. The proportion of quartz in the assemblage was the highest of the five clusters. A grinding stone and FCR indicate that food preparation also took place. However, no features were found.

#### *Cluster 4*

Cluster 4 was located at the northern end of the APE and was the largest of the data-recovery excavation blocks. The Phase II and III EUs produced 653 pieces of FCR, 73 cobble tools, and 3,343 other lithic artifacts (Table A.17). Two cordmarked ceramic sherds were also found (see Figure 5.9, Cat nos. 618D.2 and 628.13). Although most of the artifacts (78%) were found in the plowzone, artifacts extended somewhat deeper into the subsoil than in other excavation blocks. Artifact density decreased with depth in the subsoil. The fourth subsoil level produced only eight pieces of debitage.

Quartz types predominate in the assemblage, comprising 62.7% of the lithic materials. Chert, jasper, and quartzite comprise most of the remaining lithics. Only 1.2% of the lithic materials come from the Delaware Chalcedony Complex. Cryptocrystalline quartz comprises 29.7% of the assemblage. Non-local rhyolite and argillite have a somewhat higher proportion (0.6%) of the chipped stone material than in other clusters; all of the rhyolite artifacts are debitage. Five argillite artifacts were also found, including a late-stage biface, two points, and a biface-thinning flake.

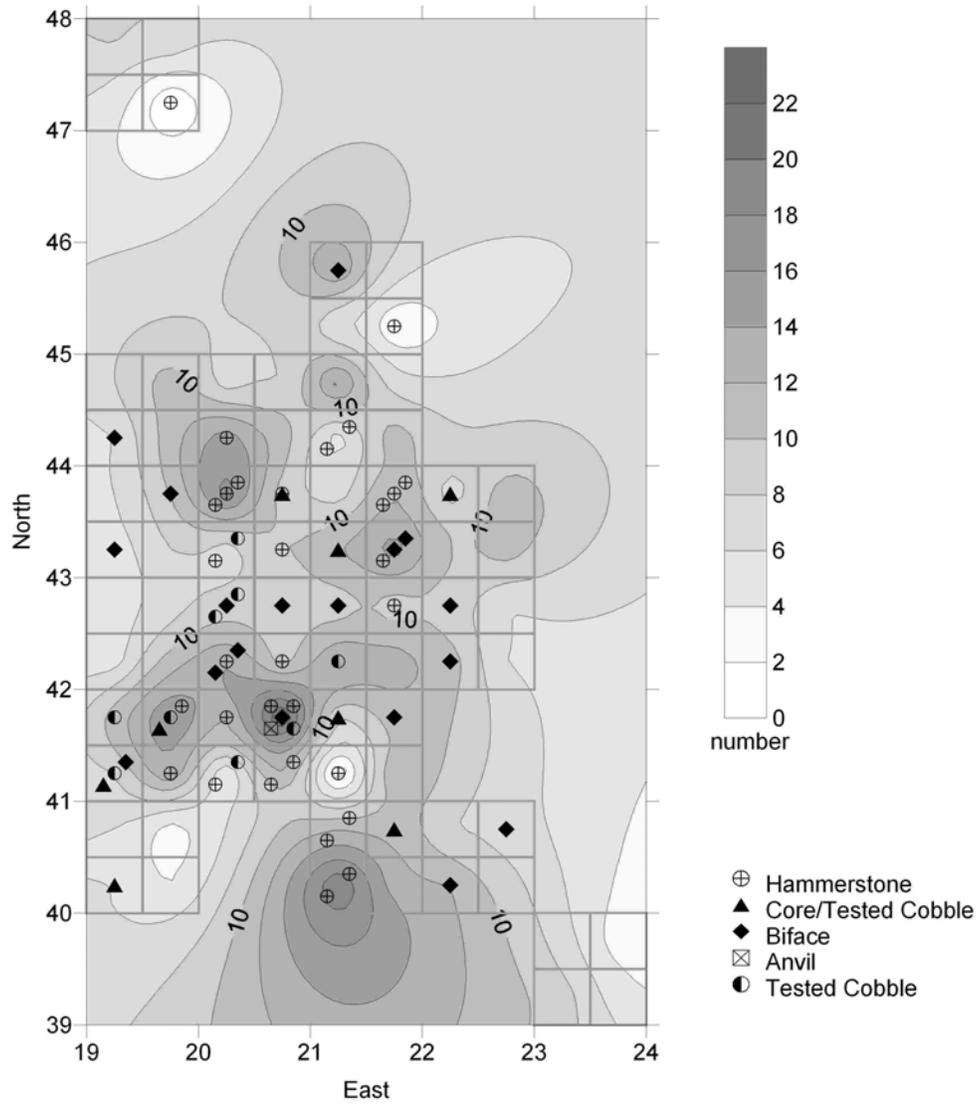


Figure 5.30 Distribution of hammerstones, bifaces, cores, and tested cobbles, Cluster 3.

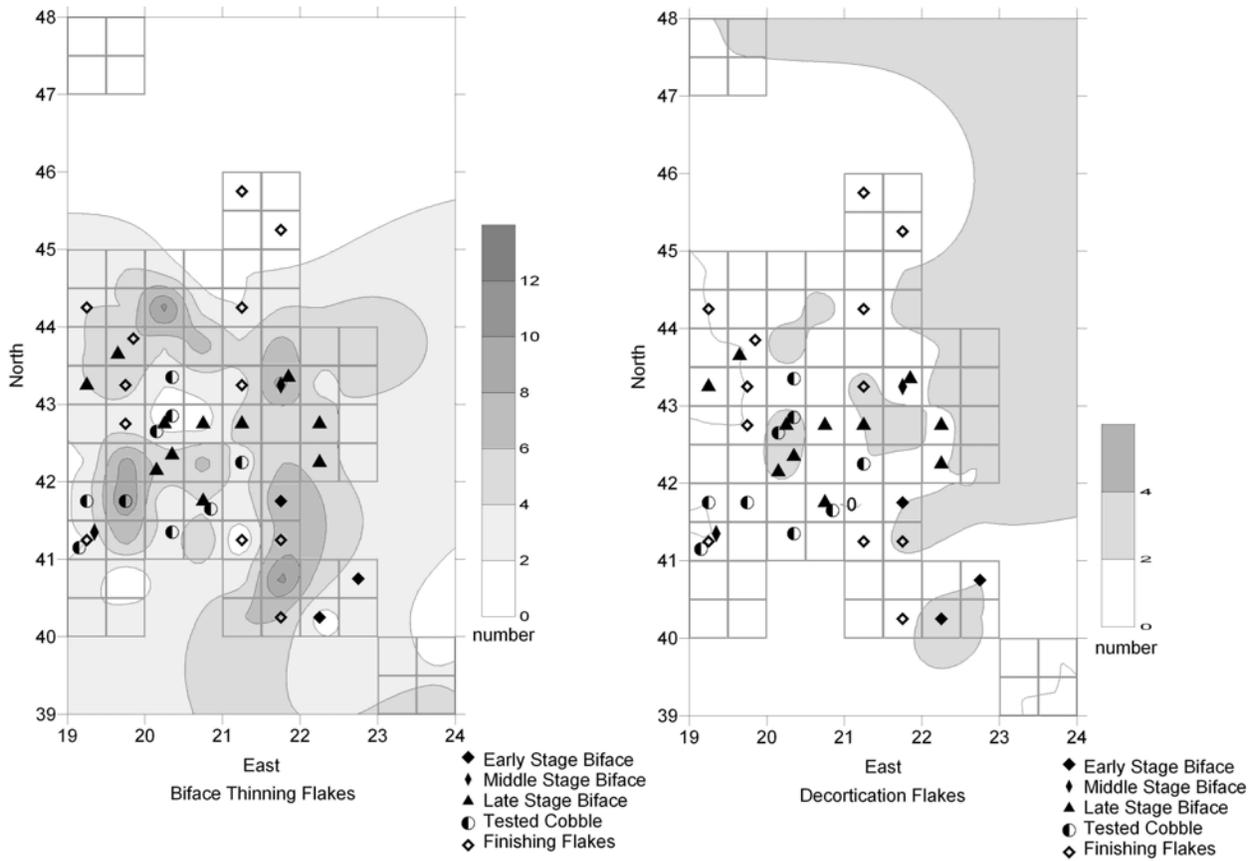


Figure 5.31 Distribution of lithic reduction artifact types, Cluster 3.

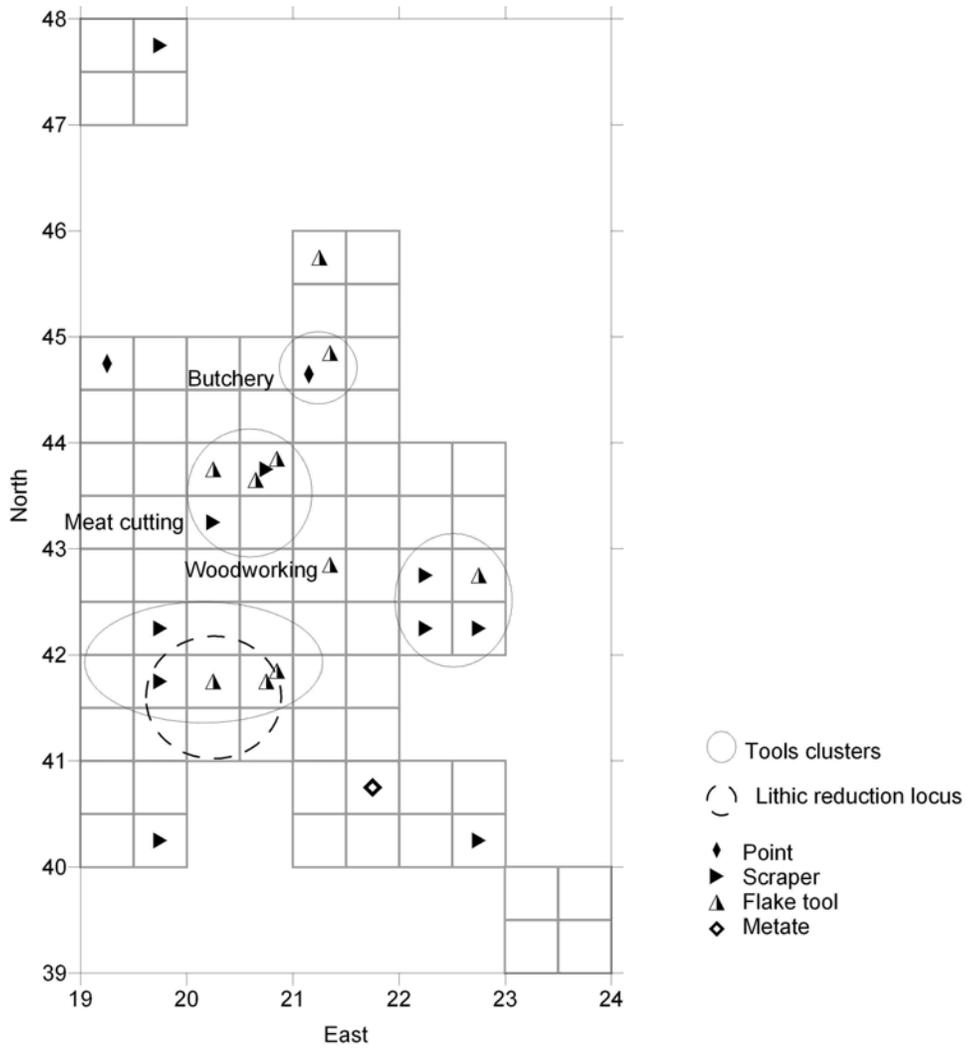


Figure 5.32 Distribution of tools, Cluster 3.

Chipped stone tools include points and point fragments, a bifacial knife (see Figure 5.7, Cat no. 597A.1, end and side scrapers (see Figure 5.6, Cat nos. 40D.1, 254A.1, 574D.1, and 592A.6), retouched and utilized flakes (see Figure 5.8, Cat nos. 401A.3, 401A.4, 616A.2, and 616B.1), spokeshaves (see Figure 5.8, Cat no 589C.1), and unidentifiable unifaces. Most of the tools are utilized, retouched, or modified flakes, indicating the importance of expedient technologies. Cobble tools consist primarily of hammerstones. Three abraders, four anvils, a mortar, a pitted cobble, and an unidentifiable cobble tool were also found.

Thirty-six points or fragments and two reworked points (see Figure 5.7, Cat no. 570C.1 and 608D.1) were found in Cluster 4. These artifacts include the full temporal range of Woodland I types, such as Brewerton side-notched, corner-notched, and eared-notched (see Figure 5.4, Cat nos. 260D.1, 329A.1, 554A.1, 573D.5, and 620D.1); Poplar Island (see Figure 5.1 Cat nos. 202A.1, 401A.1, 453A.1) ; Rossville (see Figure 5.4, Cat nos. 43.2, 408C.1, and 410A.1) ; Fox Creek (see Figure 5.2, Cat nos. 271B.1 and 573D.11); and Jack's Reef Pentagonal (see Figure 5.2, Cat no. 357C.1). A broken point of chert could be part of a Susquehanna broadspear or fishtail point (see Figure 5.5, Cat no. 406D.1). Three triangular points were found that could date to either the Woodland I or II periods (see Figure 5.3, Cat nos. 28A.1, 65A.1, and 580D.1). Three unidentifiable stemmed points—a teardrop point (see Figure 5.5, Cat no. 589D.1), two untyped side-notched, and an untyped lanceolate point (see Figure 5.5, Cat no. 233B.1)—were also recovered. One crude point retains cortex and may be unfinished. The remaining points are unidentifiable fragments. The points are fashioned from a variety of lithic material types with no clear preference for any material type.

In all, 53 artifacts from Cluster 4 were examined for microwear traces; 29 revealed no or minimal traces. Five points and a reworked point were examined under high-power magnification (see Table A.14). All exhibit hafting traces and five of the six have impact fractures. Two of the five, a Rossville point and a Poplar Island point, were used for butchery and one, a Fox Creek stemmed point, was used on an indeterminate material. The reworked point fragment was used for butchery and antler working. The other two, a Rossville point and a Brewerton eared-notched point, show no evidence of use other than as projectiles. The bifacial knife was used for butchering. Three scrapers and a scraper/adze were examined, two of which had evidence of hideworking. Two graters and a graver/spokeshave provided evidence of working hide and bone. Only one of the two endscrapers shows identifiable use wear, interpreted as working bone. Four utilized flakes and one retouched flake were examined and yielded evidence of meat cutting, hideworking, and working bone and wood. A notched flake is too weathered for identification. Overall, the assemblage contains a wide variety of tool types, used for a broad range of activities.

Biface-thinning flakes comprise 53.2% of the identifiable flakes, finishing flakes comprise 16.6%, and most (55%) of the bifaces are late stage—all of which indicates that the late stages of biface reduction predominated. Three bipolar cores, three bipolar flakes, and four anvil stones indicate that bipolar manufacturing techniques were used, although to a limited extent.

Heat-treated artifacts other than FCR number 277, representing 8.2% of the lithic assemblage. The proportion is significantly higher than in Clusters 1, 2, and 3. The artifacts consist primarily of debitage, but scrapers, bifaces, cores, points, and cobble tools also show evidence of thermal

alteration. Chert and jasper comprise most of the heat-treated material, but other materials such as quartz and quartzite are also represented.

Feature 3, a cluster of cobbles with no apparent organic stain, was found in upper level of subsoil in EU 30. The cobbles include three hammerstones, a pitted cobble possibly used as an anvil stone, two unidentifiable cobble tools, and two unmodified cobbles. Given the clustering of these artifacts, it is likely they were deposited in a pit from which any organic signature had leached. Feature 4 was interpreted as an earth oven, primarily on the basis of its shape and size. However, it may have been used for other tasks, possibly including the heat treatment of artifacts.

Debitage densities ranged from zero to 42 per quadrat. The distribution of debitage revealed two high-density areas in the center of the Cluster 4 block, along with two smaller high-density areas to the north (Figure 5.33). Features 3 and 4 were located in close proximity to each other in areas of low debitage density in the southern portion of the block.

FCR was scattered in small clusters across the block, with one dense cluster of three large pieces in the southeast corner (see Figure 5.33). Overall, FCR densities ranged from zero to 10 per 50-x-50-centimeter (1.6-x-1.6-foot) quadrat. Eight pieces of FCR, a relatively high number, were found in the subsoil in the northwest corner of the block (centered at N96.75E20) and could conceivably represent a pit feature that had been leached of visible organics.

Quartz distribution corresponded closely to the overall distribution of debitage, as did Columbia Formation materials. Cryptocrystalline quartz and Delaware Chalcedony Complex lithics were sparsely distributed with no clear pattern (Figure 5.34).

Hammerstones, bifaces, cores, and tested cobbles were densely distributed across the excavation block, reflecting either long-term occupation by a single group or, more likely, multiple occupations (Figure 5.35).

The distribution of biface-thinning flakes was generally similar to that of debitage overall (Figure 5.36). The primary concentration of finishing flakes was associated with a single late-stage biface, but consisted of a variety of lithic materials (Figure 5.37). A number of high-density areas for decortication flakes were also present, but included more than a single material type (Figure 5.38). Thus, none of the high-density locations of finishing flakes or decortication flakes could be interpreted as single-episode reduction activity areas. The distribution of thermally altered artifacts was generally similar to that of total debitage, indicating that heat treatment likely took place elsewhere on the site (Figure 5.39).

The distribution of chipped stone and other cobble tools generally followed that of debitage, with the heaviest concentrations near the central and northern portions of the excavation block (Figure 5.40). Cluster 4 appears to represent a "smear and blend" pattern, defined by M. Stevenson (1991) as a very dense distribution of artifacts with no patterning likely resulting from the presence of multiple occupations.

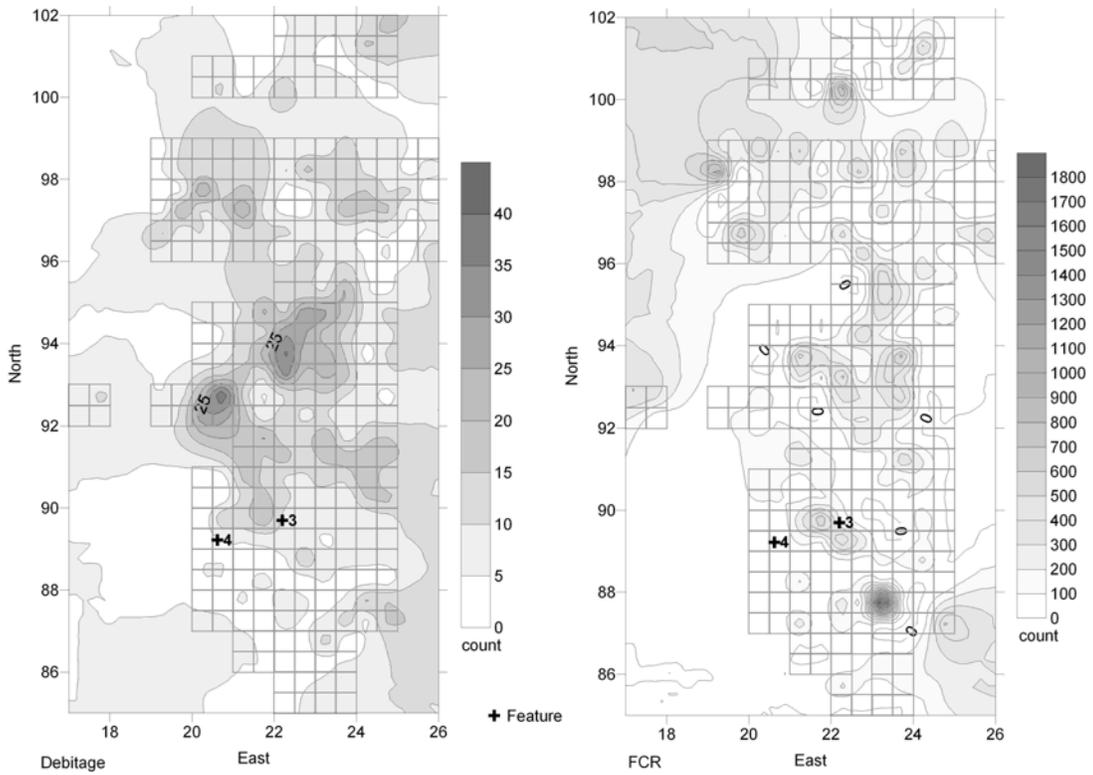


Figure 5.33 Distribution of debris and FCR, Cluster 4.

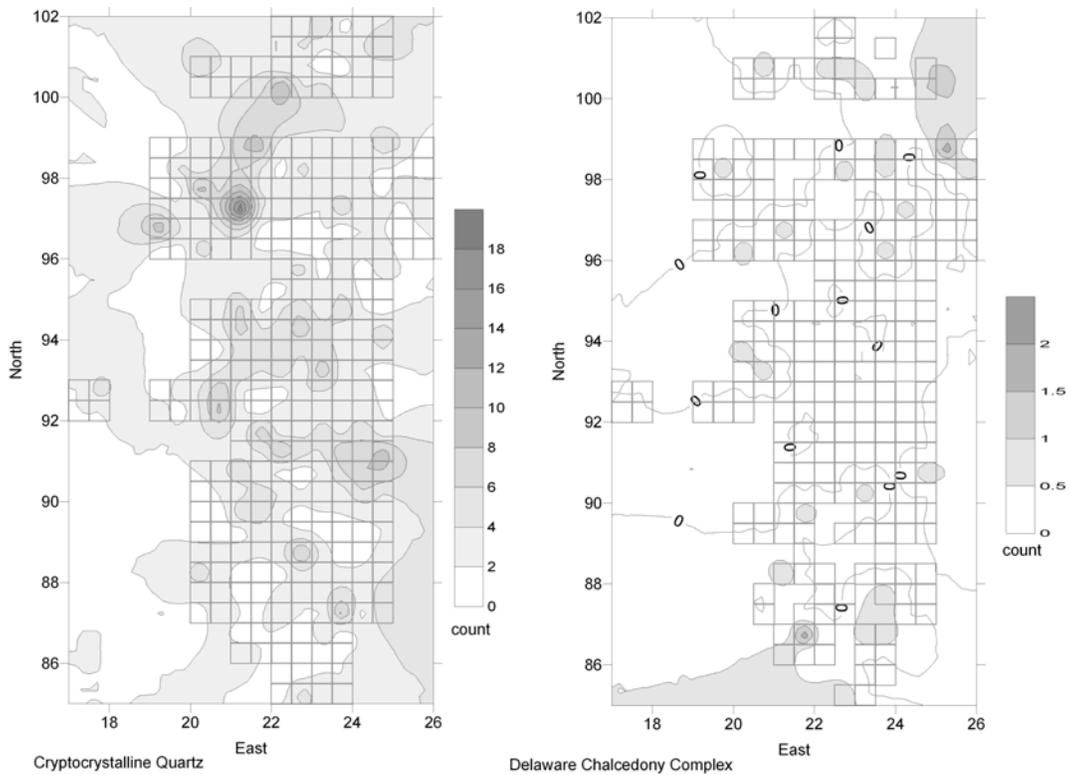


Figure 5.34 Distribution of debris by material type, Cluster 4.

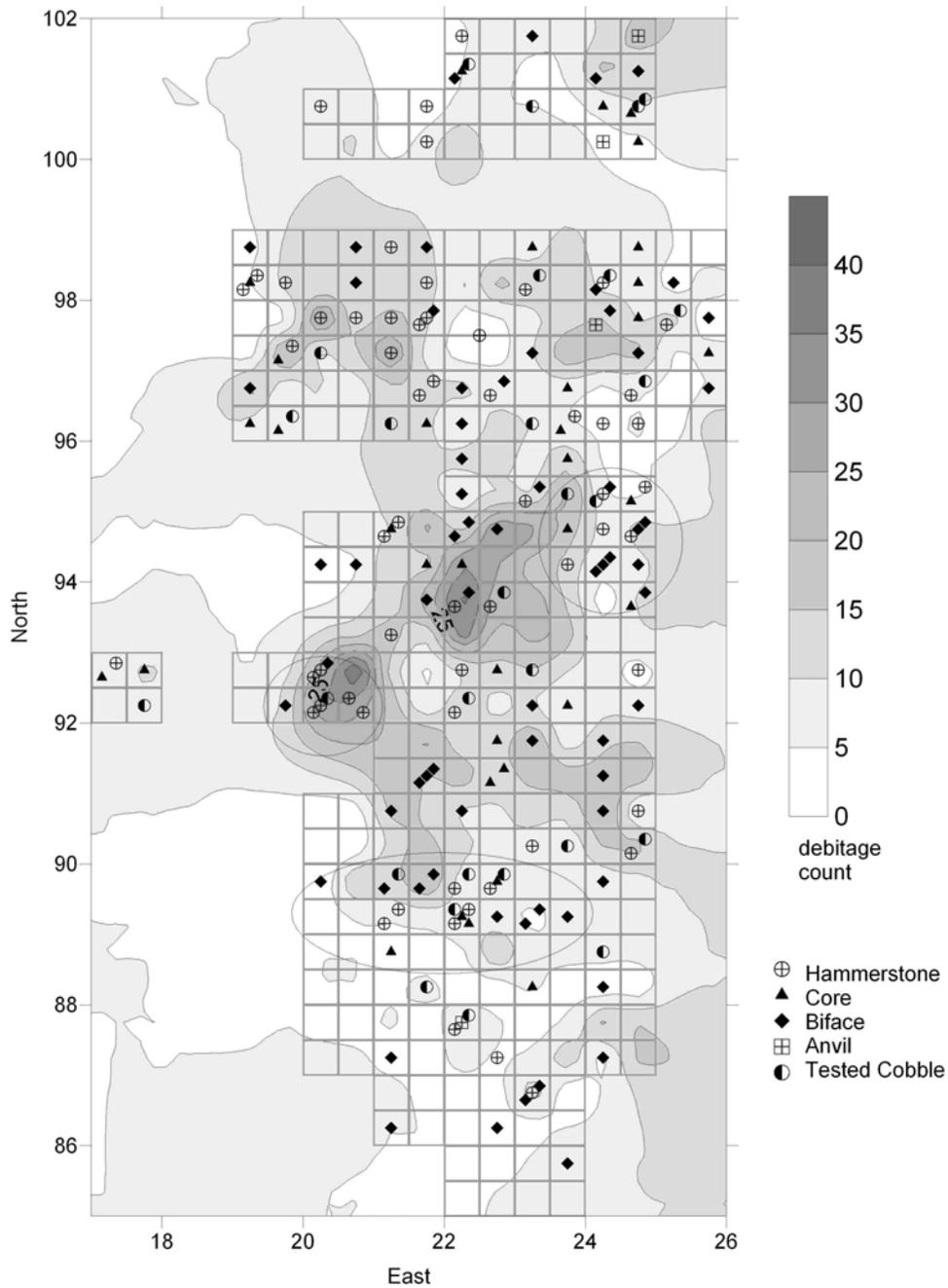


Figure 5.35 Distribution of hammerstones, bifaces, cores, and tested cobbles, Cluster 4.

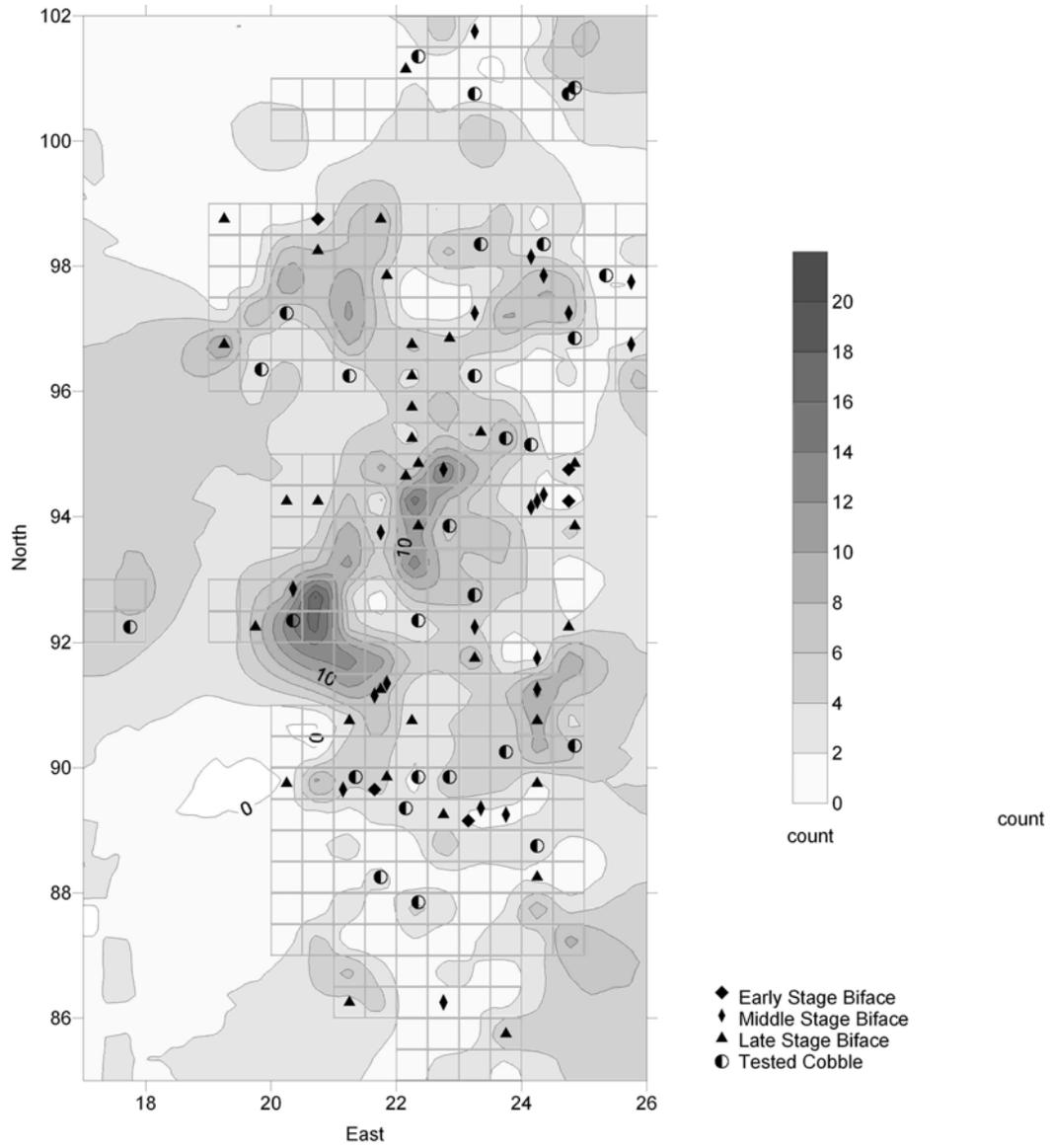


Figure 5.36 Distribution of biface-thinning flakes, Cluster 4.

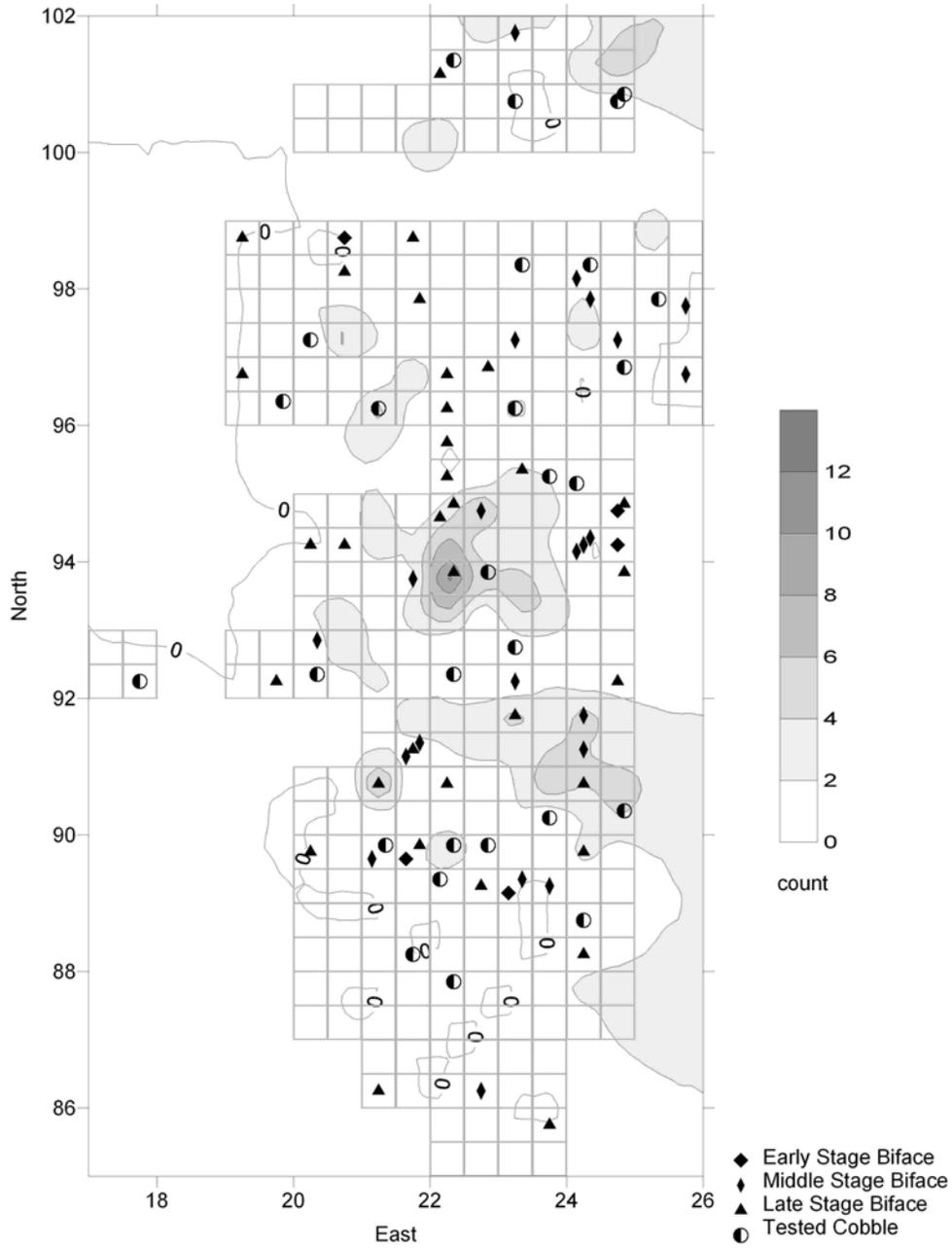


Figure 5.37 Distribution of finishing flakes, Cluster 4.

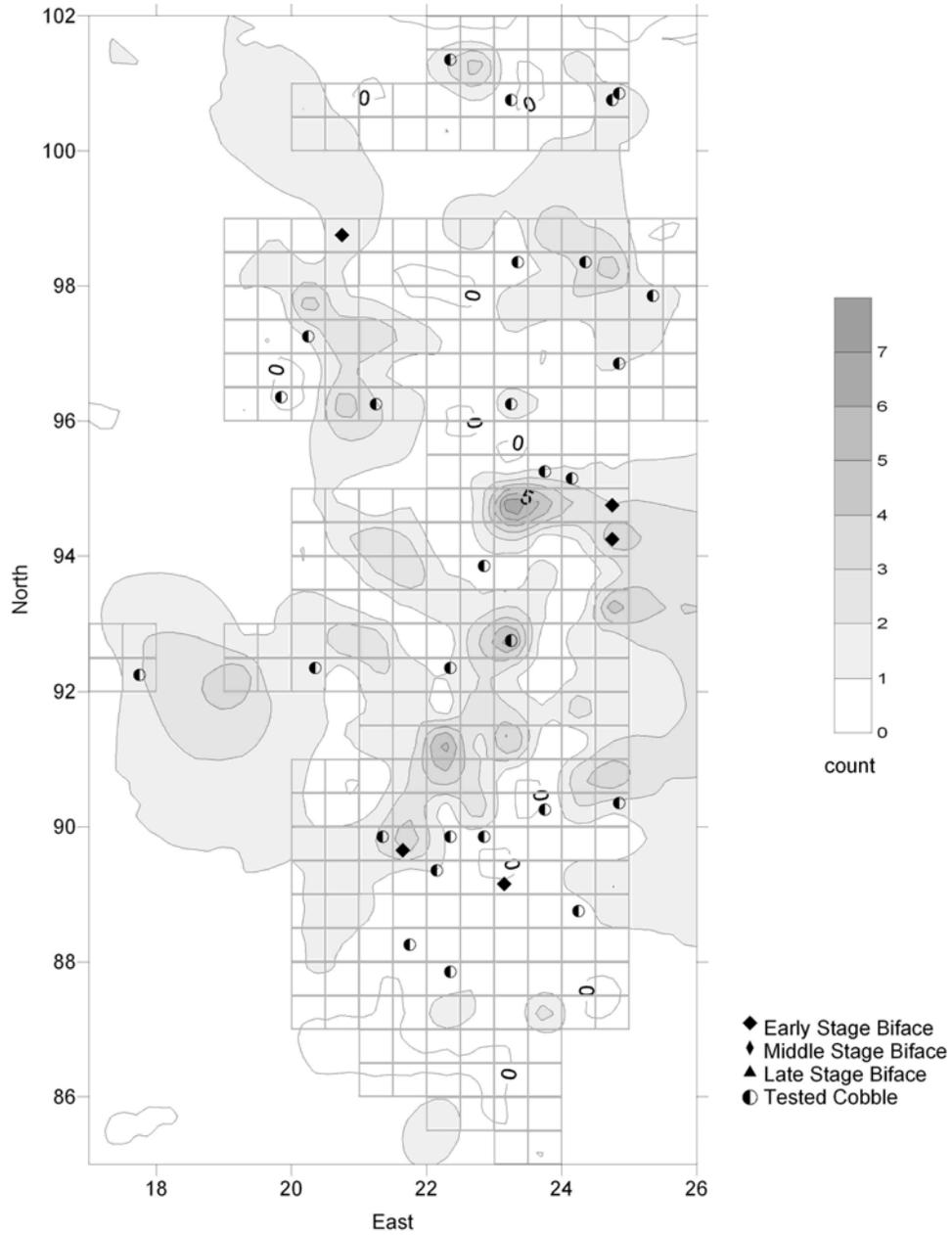


Figure 5.38 Distribution of decortication flakes, Cluster 4.

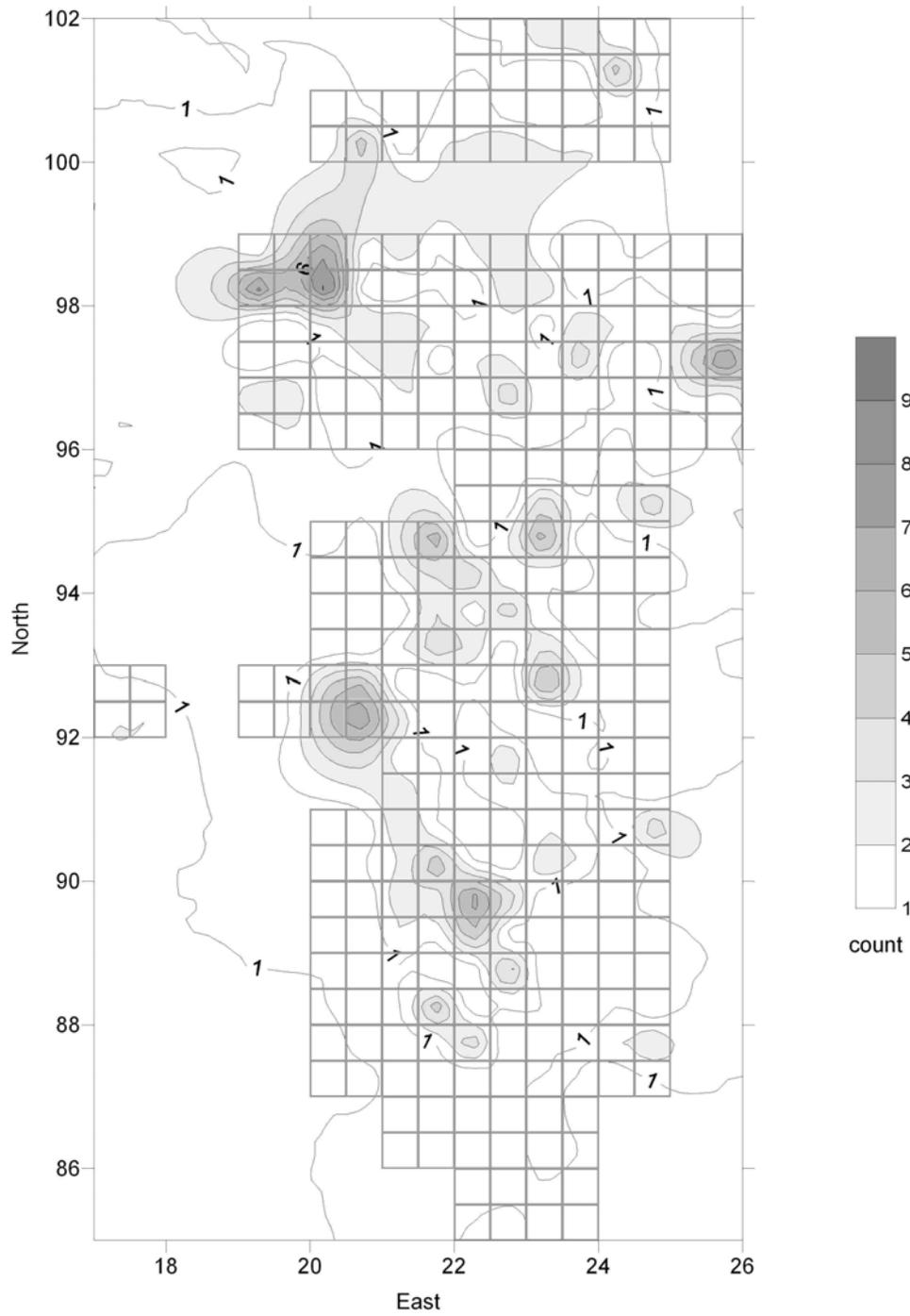


Figure 5.39 Distribution of thermally altered artifacts, Cluster 4.



*Cluster 5*

The cluster was identified on the basis of one Phase II excavation unit with relatively high artifact density located between Clusters 1 and 3. Three additional EUs were excavated during data-recovery investigations. The four EUs yielded 22 pieces of FCR (1.2 kilograms), five cobble tools, three small pieces of steatite, and 112 other lithic artifacts (Table A.18). Eight ceramic sherds were also found.

The chipped stone assemblage consists primarily of debitage. Two bifaces, two cores, a reworked point/scrapper (see Figure 5.7, Cat no. 491C.1), two utilized flakes, and an unidentifiable unifacial tool were also found. The point/scrapper has a reworked tip; it has hafting traces, but no evidence of use wear.

The proportion of quartz in the assemblage is only 29.4%, and unlike other areas of the site, it is not the predominant lithic material. Chert and jasper each have somewhat higher proportions than quartz. As a result, the proportion of cryptocrystalline quartz is also higher at 61.6%. The proportion of materials of the Delaware Chalcedony Complex is 13.4%. No rhyolite or argillite was identified.

The proportion of biface-thinning flakes (52.1%) is similar to that of Clusters 3 and 4, but the proportion of decortication flakes (9.6%) is low and the proportion of finishing flakes is high (27.4%). The debitage indicates that late-stage reduction and tool finishing were the predominant manufacturing activities.

Cobble tools include an anvil and four hammerstones. The steatite consists of very small chips, but suggests the possibility that other steatite artifacts could be present at the site, though likely in small numbers.

Twenty-two artifacts show evidence of thermal alteration, representing 19.0%, the highest proportion of the five clusters. No evidence of bipolar technology was found.

The ceramic artifacts include four plain, one net-impressed, and three cordmarked sherds likely representing at least five vessels (see Figure 5.9, Cat no. 496A.5). Three of the sherds are non-diagnostic rims. Four of the vessels are likely Woodland II Minguannan, whereas the fifth is likely Woodland I Wolfe Neck or Susquehanna.

Because only four non-contiguous units were excavated in Cluster 5, no distribution maps were generated.

The presence of ceramics together with a triangular point suggests a Woodland II occupation. The steatite chips may indicate the presence of an additional occupation dating to sometime between A.D. 1 and 600, when this material was widely traded.