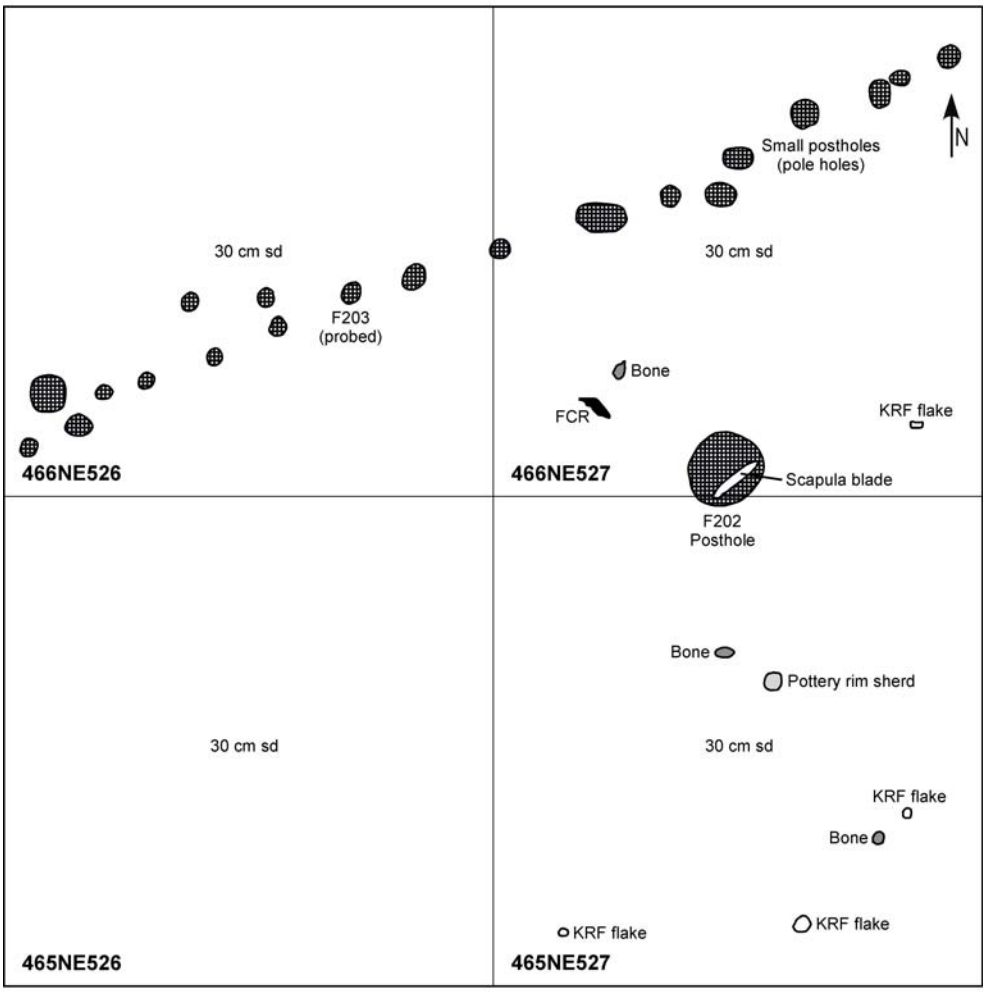
ELBEE SITE (32ME408) AND KARISHTA SITE (32ME466)

2010 ARCHEOLOGICAL TEST EXCAVATIONS KNIFE RIVER INDIAN VILLAGES NATIONAL HISTORIC SITE, MERCER COUNTY NORTH DAKOTA

Dennis L. Toom and Michael A. Jackson

March 2012



Final Revised Report

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by

Dennis L. Toom and Michael A. Jackson

with a contribution by Kathryn Puseman

Anthropology Research
Department of Anthropology
University of North Dakota
Grand Forks ND 58202-7094

Contribution No. 444

work performed for and report submitted to

Midwest Archeological Center
National Park Service
Lincoln NE 68508-3873

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Report prepared in fulfillment of Task Agreement No. J6115100302
to Cooperative Agreement No. CAH6000060100 between the
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endorsement

Dennis L. Toom, Ph.D., Principal Investigator

ABSTRACT

In May and June 2010 the UND archeological field school conducted test excavation work at the Elbee (32ME408) and Karishta (32ME466) archeological sites in the Knife River Indian Villages National Historic Site, Stanton, North Dakota. The work was done in cooperation with the National Park Service (NPS) to test and evaluate untested parts of the site, and to investigate archeological features exposed by erosion in the Knife River cutbank as a result of spring flooding in recent years. NPS personnel conducted a new geophysical survey of the northern part of the site in support of the testing effort. Five 2-x-2-m excavation units (XUs) of varying depths were dug at the site, two in the A terrace village area and three in the lower elevation B terrace area. In addition, three 1-x-2-m excavation units were dug at the Karishta site (32ME466) in an attempt to verify its location relative to existing documentation.

XU5 and XU9 were shallow excavations dug into the A terrace area of the Elbee village site. XU5 reconfirmed the presence of Middle period Plains Village deposits in the northern part of the A terrace village area. XU9, dug in the southern part of the A terrace Elbee village area, uncovered Late period Plains Village deposits and the remains of what were probably internal earthlodge (house) features. The likely existence of a Late Plains Village earthlodge at the XU9 location is considered to be the most important discovery made by the 2010 investigations. XU6, XU7, and XU8 were deep excavations dug into the far northern part of the Elbee site, in the B terrace area. These excavations established that low-density artifact deposits dating to the Middle and Late Plains Village periods are present in this far northern part of the Elbee site. However, while these occupations may have been related to the earthlodge village components on the A terrace, they did not contain village features themselves. Rather, the B terrace occupations were probably the locations of short-term campsites and/or special purpose activity areas. XU6 was placed near the remnant of a basin hearth exposed in the Knife River cutbank and designated Feature 201 (F201). Wood charcoal from the hearth was radiocarbon dated to the middle A.D. 1300s, placing it within the earlier part of the Middle Plains Village period. It was speculated in the field that F201 functioned as a part of an open pottery-firing feature, largely because the base of an unfired pot was found near the hearth. However, a full consideration of associated artifacts pointed to a more general-purpose interpretation for the feature, but not necessarily negating the supposed pottery firing function.

The test excavations at Karishta, also located on the B terrace, confirmed that this site is situated essentially as indicated on the original site documentation. Karishta was found to contain a near-surface, low-density artifact deposit that is in all probability of Late Plains Village affiliation. In fact, it is thought that the Late Plains Village component at Karishta is the same as that identified just to the south in the B terrace area of Elbee.

The Elbee site has once again proven itself to be a significant archeological resource and a contributing property of the Knife River Indian Villages National Historic Site Archeological District. Karishta, on the other hand, does not appear to be archeologically significant based on the data at hand. In terms of future research at Elbee, additional excavation work in the southern site area is recommended to explore the nature of the newly discovered Late Plains Village component. Specifically, expansion of XU9 to test the hypothesis that a Post-Contact Coalescent variant earthlodge is present at this location ought to be most instructive. In the northern part of the site, the continued monitoring of the Knife River cutbank for newly exposed features also is recommended.

ACKNOWLEDGMENTS

We wish to thank Brian McCutchen, park superintendent, Maurine McGee-Ballinger, chief of interpretation, Dorothy Cook, interpretive park ranger, John Moeykens, law enforcement and resource management, and the rest of the staff at the Knife River Indian Villages National Historic Site (KNRI) for making our time at Elbee and Karishta pleasant as well as productive. Wendy Ross, the current park superintendent, and Craig Hansen, the new chief of interpretation, facilitated the transfer of collections to the park at the close of the project. Many thanks are due to Jay Sturdevant of the Midwest Archeological Center (MWAC) in Lincoln for bringing the project to the University of North Dakota and giving our archeological field school a home in 2010. Steve De Vore of MWAC graciously allowed our students and staff to tag along with the NPS archeological geophysics workshop held at KNRI in 2010. We are also most grateful for the efforts of the field school students who participated on the project and made it a success. Carrie Jackson is credited with preparing the original line drawings and artifact illustrations that appear in the report; Carrie also compiled and proofed the report for duplication. Jane Monson did her usual superb job on the routine laboratory processing and inventory work with the collections. Megan Lonski and Madisson Whitman struggled mightily with the ICMS cataloging program and got it up and running for the Elbee and Karishta collections—we couldn't have done it without their fine young minds and intuitive computer skills.

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Chapter 1
INTRODUCTION AND BACKGROUND

The Elbee Site and Its Setting

The Elbee site (32ME408) and the Karishta site (32ME466) are located on the right (south) bank of the Knife River, near the confluence of the Knife and Missouri rivers in west-central North Dakota (Figure 1.1). Elbee is one of a number of significant American Indian archeological sites concentrated in the confluence area and forming the nucleus of the Knife River Indian Villages National Historic Site (KNRI). Karishta, on the other hand, is a small, little known site of the KNRI of unknown archeological significance; it is located just north of the northern boundary of the larger Elbee site, as the limits of the two sites are presently defined. Elbee is a multi-component occupation site that may contain as many as eight archeological components, both prehistoric and historic. The most prominent component at the site, and the one that has been the focus of previous investigations, is a Plains Village tradition earthlodge village occupation dating to the Middle Plains Village period (Ahler ed. 1984; Toom et al. 2004). Remains associated with this component include village archeological features, such as pits, a hearth, and a pattern of postholes indicative of the remains of a circular house, or earthlodge. The site also was found to contain quantities of portable artifacts, mainly ceramic, lithic, and faunal materials.

Both sites are situated on the south side of the Knife River, approximately 2.5 km upstream from the present mouth of the Knife, where it flows into the Missouri River. The Elbee site consists of a narrow point of land situated between the Knife River and Mercer County Highway 37 (Figure 1.2). Except for its far northern extension, Elbee occupies the surface of the first prominent terrace above the present Knife River and its floodplain, what Reiten (1983) has identified as the A terrace (Figure 1.3a). The Knife River floodplain tends to be wooded, while its terraces are grassland. The eastern boundary of the site is formed by the Knife River and its floodplain. A short, shallow drainageway crossed by the county highway forms the far northwestern site boundary, and the western boundary proper is the county highway itself. The northern site boundary is rather arbitrarily defined as that part of the site extending onto a remnant of the lower elevation B terrace, between the northwestern drainageway and the Knife River channel (Figure 1.3b). The southern site boundary is also rather arbitrarily defined in relation to other sites. The southern part of the Elbee site was once occupied by outbuildings of the William Russell farmstead, as indicated on Figure 1.2. The surface of the site has been thoroughly disturbed by decades of past cultivation down to a depth of about 20-25 cm. Even though the integrity of surficial archeological deposits at the site has been destroyed by cultivation, major portions of subsurface village archeological features, such as pits, hearths, and postholes, remain intact and well preserved.

As was just mentioned, the northern area of the Elbee site was extended onto a remnant of the adjacent B terrace, a lower elevation river terrace defined by Reiten (1983) that also includes the Knife River floodplain. This far northern part of the Elbee site is located on a small remnant of B terrace area, which lies between the shallow drainageway and the Knife River channel (Figure 1.3b). Lateral, westward migration of the Knife River channel is cutting into and actively eroding the B terrace remnant at this location, which is being lost at a rapid rate and is now nearly gone (Figure 1.4). The B terrace remnant at Elbee contains sediments that are younger than those found at depth in the A terrace. Likewise, the drainageway that cuts through the B terrace remnant contains cut-and-fill deposits that are even younger than those generally found in the B terrace itself. In fact, stratigraphy exposed in the Knife River cutbank at Elbee clearly shows that sediments of the upper 30 cm of deposits in the surface of the A terrace are more or less equivalent in age to those buried as deeply as 100 cm in the B terrace. The reason for extending the Elbee site limits to the north (and west), onto the B terrace remnant, was to include scattered artifacts found in this locality within the Elbee site. Most of these artifacts had eroded from the cutbank and were found out of context along the river bank. As we shall see, this far northern part of Elbee could just as easily have been assigned to the nearby Karishta site, leaving the Elbee Village site area confined to the A terrace.

The Karishta site, located a short distance to the north of the Elbee northern boundary, is also situated in the same lower elevation B terrace area, cut by the same shallow drainageway that forms far northwestern boundary of Elbee (Figures 1.3b and 1.4). The precise nature of this particular piece of ground is difficult to assess because of obvious surface modifications and grading from the construction

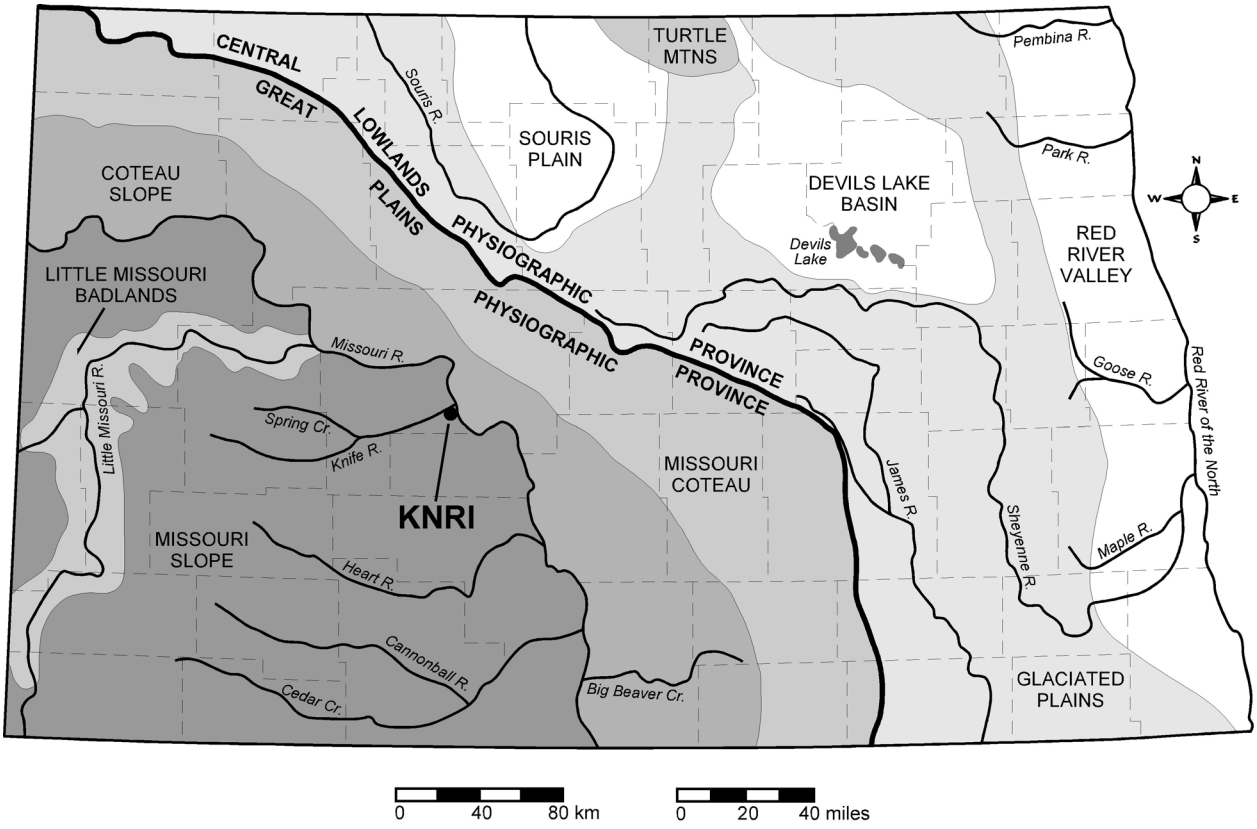

Figure 1.1. General location of the Elbee (32ME408) and Karishta (32ME466) sites, Knife River Indian Villages National Historic Site (KNRI), confluence of the Missouri and Knife rivers, western North Dakota.

of Mercer County Highway 37, located directly to the west. Karishta was initially recorded as a small surface scatter of artifacts found on the either side of the drainageway cut into the B terrace surface (Figure 1.4). It was included as a part of the present project because of its proximity to Elbee and some confusion regarding its exact location. However, the northern part of Elbee was the main focus of the present project.

The primary village component at Elbee was initially assigned to the Scattered Village complex (Lovick and Ahler 1982:237). The Scattered Village complex, dated to ca. A.D. 1400-1600 (Ahler and Mehrer 1984:300), is a rather loosely defined taxonomic unit intended to distinguish the less prominent villages at Knife River, like Elbee, from the major villages (i.e., Big Hidatsa, Sakakawea, Lower Hidatsa, and Amahami). A succinct descriptive statement along these lines is provided for the complex:

> All such components [Scattered Village] have been descriptively classified as less prominent villages, reflecting the lack of visible architectural remains on the ground surface, lack of midden piles, and the dispersed nature of artifacts which contrast so strongly with the highly prominent major village components (Lovick and Ahler 1982:209).

In addition, Scattered Village complex ceramic assemblages differ in important ways from those of more or less contemporary Plains Village phases of the Knife River region:

> Turning to the remaining scattered village complex sites, we have already noted that the S-rim and straight rim pottery at these sites is similar to but distinct from the named wares applied to the foregoing collections, namely Fort Yates ware, Riggs ware, Le Beau S-rim ware, and Knife River ware . . . In particular, lip forms are distinctive on the pottery from these sites, with high frequencies of flattened, T-shaped, L-shaped, and beaded forms

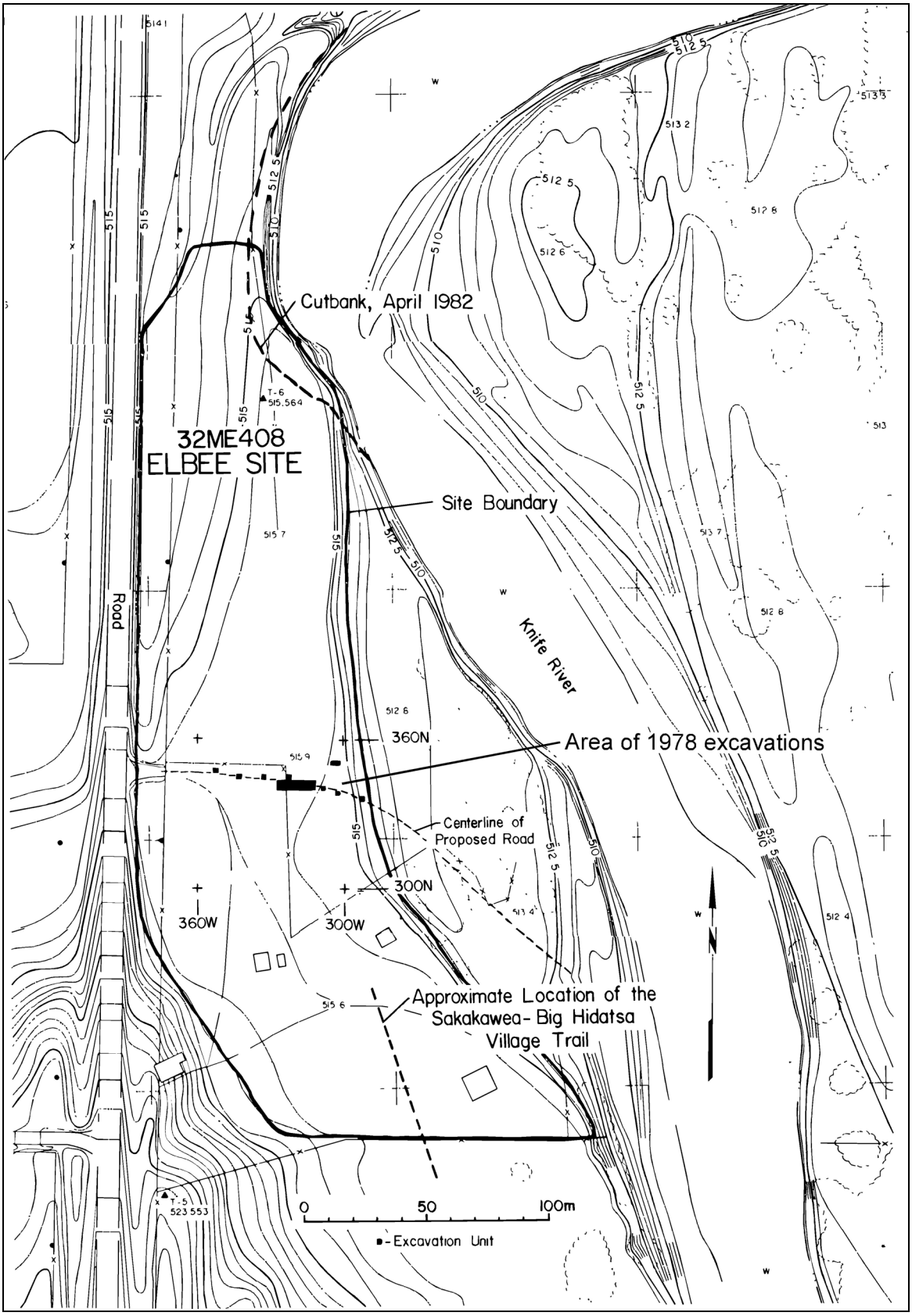

Figure 1.2. Topographic map of the Elbee site (32ME408) showing the location of the 1978 excavations and the Knife River cutbank as mapped in 1982 (from Ahler 1984:8; KNRI Base Map Sheets 15 and 16, 0.5 meter contour interval).

a

b

Figure 1.3. Photos of the northern part of the Elbee site (32ME408) and the Karishta site (32ME466). a: Elbee site on the A terrace (center, with vehicles and people) and the Knife River and its wooded floodplain on the left; taken from Karishta, south view (EB03-CP13). b: Elbee site on the B terrace remnant (center, with people); the Karishta site area is to the right in front of the trees; taken from Elbee A terrace area, northwest view (KNRI-10-49).

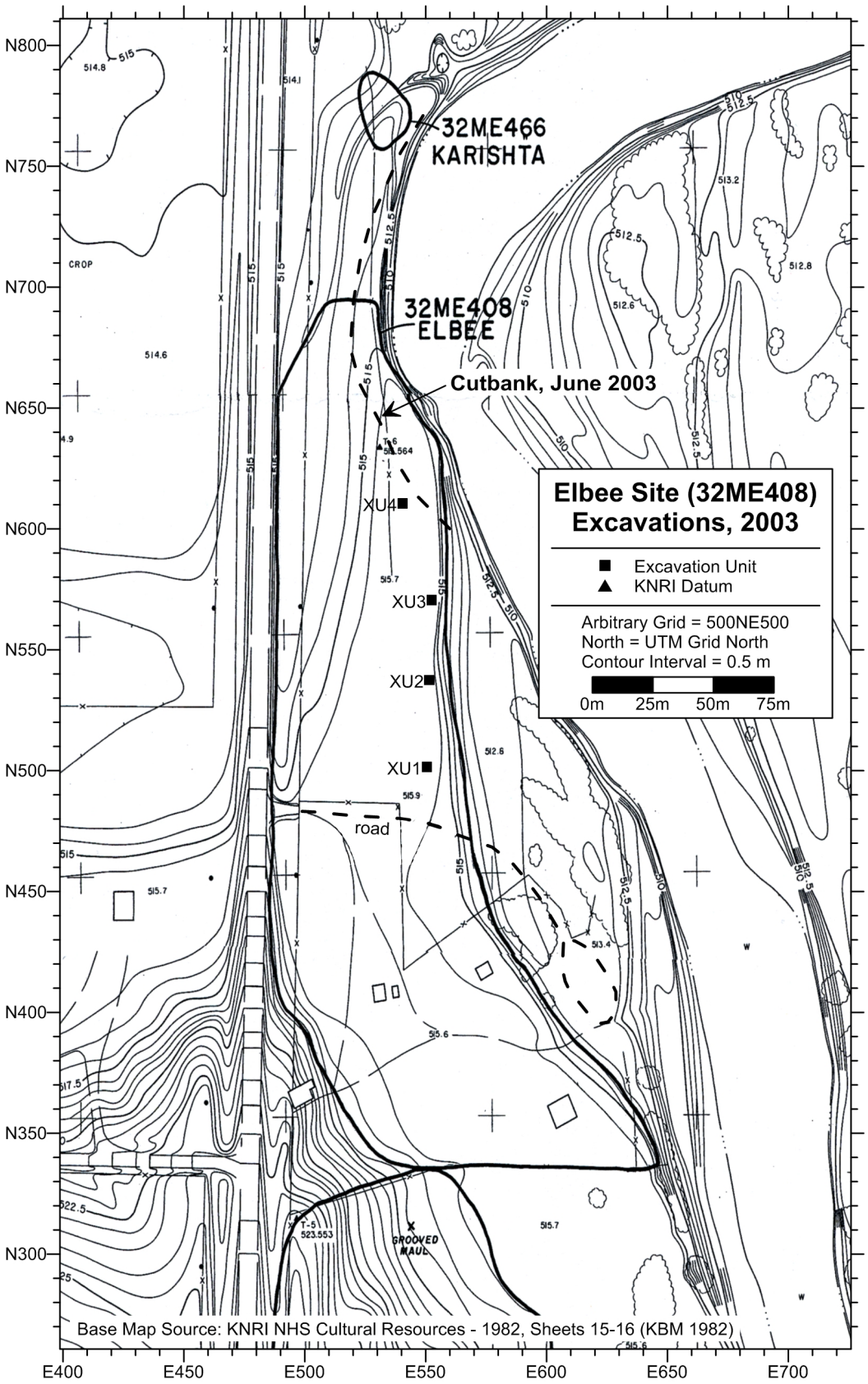

Figure 1.4. Topographic map of the Elbee site (32ME408) and the Karishta site (32ME466) showing the location of the 2003 Elbee excavations and the Knife River cutbank as mapped in 2003 (from Toom et al. 2004:3.3; KNRI Base Map Sheets 15 and 16, 0.5 meter contour interval).

> occurring. Also, the S-rim pottery exhibits a wide variety of decorative techniques including plain, horizontal trailing, and stab-and-drag which are not commonly associated with Fort Yates ware. On this basis, these collections and these components [Scattered Village] stand apart from the Nailati phase as well as from other major village component phases previously discussed (Lovick and Ahler 1982:211-212).

In the report on the 1978 excavations at Elbee, which did not come out until 1984, the assignment of the primary village component to the Scattered Village complex was repudiated and a linkage made to the Extended Coalescent variant of north-central South Dakota on the basis of architectural and ceramic similarities (Ahler ed.1984:208-210). Repudiation of a Scattered Village complex affiliation was based on certain perceived ceramic differences between the Elbee assemblage and assemblages from other Scattered Village complex sites, to wit, more straight rims with horizontally trailed decoration in the Elbee sample as opposed to more S-rims and cord-impressed decoration in the other Scattered Village samples (Ahler ed.1984:116). In the synthesis of The Phase I Archeological Research Program for the KNRI, the main village component at Elbee is left unassigned as to phase, complex, or ethnic tradition (Ahler 1993:76). Apparently, Ahler had rethought the Extended Coalescent affiliation for Elbee but could not provide a specific alternative. More recently, Toom (2004) has suggested that the main village component at Elbee is a manifestation of the Scattered Village complex, which he in turn links to the Northeastern Plains Village complex. One of the more interesting aspects of the present investigations will be to see how these various cultural-historical interpretations, and reinterpretations, play out in light of new data.

The Knife River Indian Villages National Historic Site is located in the northwestern extremity of the Southern Missouri River Study Unit of the *Archeological Component of the North Dakota Comprehensive Plan for Historic Preservation* (SHSND 1990, 2008). The reader is referred to this document for background information on the larger environmental setting and cultural-historical context of the KNRI and its archeological sites. These topics are covered in much greater detail in the four-volume report on The Phase I Archeological Research Program for the KNRI (Thiessen ed. 1993). The reader likewise is referred to these volumes for particular background and historic context information of interest.

Project Description

The Midwest Archeological Center (MWAC) of the National Park Service (NPS), Lincoln, Nebraska, requested that the Anthropology Research section of the Department of Anthropology, University of North Dakota (UND), Grand Forks, conduct evaluative archeological test excavation work at the Elbee Village site (32ME408), a Plains Village period occupation site located at the Knife River Indian Villages National Historic Site (KNRI) near Stanton, North Dakota. Previous evaluative testing work was done at the site by UND in 1978 (Ahler ed.1984) and 2003 (Toom et al. 2004). The 1978 test excavations were immediately expanded into mitigative (salvage) excavations upon the discovery of intact village features in the path of a proposed access road through the central part of the site (Ahler ed.1984). The 1978 excavations were mainly limited to that part of the site where road construction would directly impact significant village features, leaving open the question of northern and southern site boundaries (Figure 1.2). The 2003 testing work was restricted to that part of the site area north of the access road, in the A terrace surface, which had not yet been formally evaluated (Figure 1.4). The far northern part of the Elbee site is being actively eroded by the Knife River. Therefore, one of the main goals of the 2003 testing work was to evaluate the archeological content and significance of the northern site area in order to better determine the erosion threat to significant archeological deposits and the possible need for bank stabilization work or some other mitigative action.

The main impetus for the present testing project was the continued erosion of the Knife River cutbank at Elbee as a result of high water events in the Knife River in recent years. This further erosion had exposed materials of suspected archeological origin in the cutbank, most notably the profile of a hearth feature at a surface depth of about 100 cm in the far northern part of the site, buried in a small remnant of B terrace area that is cut by a shallow drainageway. In addition, it was decided to conduct limited testing in the area of the Karishta site in an attempt to confirm its location and perhaps gather enough information to better define its archeological content. If time permitted, it also was decided that a test in the southern part of the site, south of the access road, would be informative, because this part of the site had not been previously tested. The 2010 UND Archeological Field School was the main participant in the conduct of the testing work, with assistance provided by NPS-MWAC personnel.

The KNRI is federal property managed by the U.S. Department of the Interior, National Park Service (NPS). It is operated by the NPS as an archeological preserve and interpretive center. The principal archeological sites at the KNRI are earthlodge villages of the Plains Village tradition that are mainly affiliated with the Hidatsa Indian tribe, and, to a lesser extent, the Mandan Indian tribe. The Hidatsa and Mandan Indians, along with the Arikara Indians, make up the Mandan, Hidatsa, and Arikara Nation (MHA Nation), and are also known as the Three Affiliated Tribes. The MHA Nation occupies the Fort Berthold Reservation in west-central North Dakota. Tribal headquarters are located in New Town, North Dakota. Prior to the initiation of fieldwork, MHA Nation tribal representatives were consulted on the conduct of the proposed project, as was the North Dakota State Historic Preservation Office (ND-SHPO) at the State Historical Society of North Dakota (SHSND), Bismarck. These project consultations were undertaken by NPS personnel at the KNRI.

The proper treatment of cultural resource (archeological) sites at the KNRI is the responsibility of the NPS under federal law. Authority for the work reported here resides in various federal laws and regulations, including the National Historic Preservation Act of 1966, the Archeological and Historic Preservation Act of 1974, the Archeological Resources Protection Act of 1979, the National Environmental Policy Act of 1969, 36 CFR 800--Protection of Historic and Cultural Properties, and 43 CFR Part 7--Protection of Archaeological Resources: Uniform Regulations.

The evaluative test excavations conducted at the Elbee site by UND in 2010 and covered by the present report, as well as the testing work done in 2003, were the logical continuation of the program of archeological investigations initiated by the NPS at the KNRI over 30 years ago (see Thiessen ed. 1993). The Elbee site is a significant archeological resource listed in the National Register of Historic Places (NRHP) as a contributing property of the Knife River Indian Villages National Historic Site Archeological District. Nevertheless, questions still remain regarding the exact spatial limits of its archeological deposits, particularly in the far northern part of the site and to the south of the access road that crosses the central part of the site. Testing of the far northern site area is aimed at evaluating its archeological content and significance, if any, with respect to established NRHP evaluation criteria (see Little et al. 2000; NPS 1998). If the far northern site area at Elbee is found to contain significant archeology, then mitigation of impacts to the site as a result of bank erosion by the Knife River may be necessary.

Previous Archeological Investigations and Findings

The Elbee site was discovered and first recorded in April 1978 as part of an archeological survey conducted for a construction access road and staging area needed for bank stabilization work at the nearby Sakakawea Village site (Ahler ed.1984:1). The site was test excavated in June and July 1978. Plains Village features, consisting of a large pit and the remains of a house floor, were identified in the access road right-of-way (Figure 1.2). Rather than shift the road to another location where it was probable that other archeological features would be encountered, it was decided to conduct limited salvage excavation of the features within the path of the road (Ahler ed.1984:2).

Excavations at the site in 1978 included the initial evaluative testing and subsequent salvage excavation in the central part of the site, along the proposed access road route (Ahler ed. 1984). The site area had been plowed in the past, so the first step in the 1978 excavations was to strip off the plowzone and search for intact sub-plowzone features. Of particular importance was the partial exposure of the remains of a circular earthlodge. Features making up and associated with the larger earthlodge feature included a central hearth, two cache pits, a smaller pit, and numerous postholes. A shallow trench-like feature interpreted as the remains of an early historic period trail running between Big Hidatsa and Sakakawea villages also was encountered. The presence of intact village features unequivocally revealed the Elbee site as a significant archeological resource. Still, the question of site limits remained open because the areal extent of village features had not been adequately explored, particularly to the north and south of the access road area. Further investigations were therefore needed to better define the horizontal boundaries of the site and its village features.

The 1978 excavation work was preceded by a magnetometer survey aimed at locating subsurface archeological features. This effort met with very limited success because of the many recent ferrous (iron) artifacts scattered about the site. In anticipation of the 2003 site testing work discussed below, a

magnetometer survey was conducted of the northern part of the site in the fall of 2002 in order to suggest archeological feature locations (Volf 2002). Metal detecting of as many survey blocks as time would allow was done to eliminate interference from historic debris. The 2002 magnetic survey did identify a number of small-sized and large-sized anomalies. The larger anomalies are of dubious archeological origin and may simply reflect stochastic patterning in the data. The smaller anomalies are believed to be archeological features, most likely hearths or pits. These were the focus of the 2003 test excavations.

In June 2003 the UND archeological field school conducted test excavation work in the northern part of the A terrace area at the Elbee village site. The testing work was done at the request of the NPS to determine if action was warranted to mitigate the impacts of erosion along the Knife River cutbank in the extreme northern site area. As mentioned above, NPS personnel conducted a magnetometer survey of the northern site area in the fall of 2002 in order to target potential archeological features for excavation in the testing effort. Four 2-x-2-m excavation units (XUs) were dug at the site, three over high interest magnetic anomalies where features were likely to be present. The fourth XU was dug in the northern part of the site, at the end of the A terrace near the Knife River cutbank, to specifically examine this location for archeological deposits (Figure 1.4). Two 1-x-1-m squares in the two northernmost XUs were dug down to at least 100 cm to check for the presence of more deeply buried archeological deposits.

The 2003 excavations found that Plains Village period artifacts were restricted to the plow zone in the north site area, except for those contained in subsurface features such as pits and hearths. The excavations uncovered three Plains Village archeological features, including two large undercut storage pits and one basin-shaped hearth. These features were excavated and their contents account for the bulk of the artifacts recovered from the site in 2003. On the basis of these excavations, the northern part of the Elbee site, on the A terrace, was determined to contain the remains of a single Plains Village archeological component, radiocarbon dated to the mid-A.D. 1500s, and affiliated with the Scattered Village complex. Scattered recent historic debris believed to relate to the modern William Russell farmstead component also was found in the northern site area.

Excavation Units 1, 2, and 3 (XU1-3) were placed over predicted feature locations based on the interpretation of magnetic survey data (Figure 1.4). The fact that all three XUs were actually positive for archeological features is remarkable and attests to the accuracy of the magnetic survey and the interpretation of the magnetic survey data (Volf 2002). Two of the features were large undercut storage pits that had been intentionally filled with earth and trash following their primary use. Storage pits such as these are typically found in or near Plains Village tradition earthlodge villages, and are one of the hallmarks of the tradition. The third feature, a basin-shaped hearth, was typical of those used as central hearths in late prehistoric earthlodge-type structures.

Given the findings of the test excavation work vis-à-vis the magnetic survey results, it was concluded that all high interest anomalies identified by the magnetic survey likely represent archeological features such as pits or hearths. Some or all of these features could be associated with house remains whose magnetic signatures have been obscured by plowing. All high interest anomalies are located in the eastern and south-central parts of the north site area, south of grid line 580N. Therefore, it was also concluded that the main Plains Village component at the Elbee site was concentrated in the eastern part of the site, along the terrace scarp overlooking the Knife River bottom. It was further concluded that areas of the site located north of grid line 580N are unlikely to contain significant Plains Village archeological deposits. This means that erosion of the high Knife River cutbank in the northern part of the site would have to progress another 50 meters or so into the site area before significant archeological features would be threatened.

The presence of intact portions of subsurface Plains Village archeological features within the bounds of the Elbee site makes it clear that the site contains significant archeological remains. Thus, the status of the site as a significant archeological resource has been reaffirmed by the present investigations and can be extended to most of the north site area as well. Lastly, it was recommended that future investigations of the site would do well to examine the south site area, that part of the site located to the south of the access road, which still remains unevaluated. The combination of magnetic survey work and ground-truth test excavation work that proved so effective in the investigation of the north site area in 2003 was likewise recommended for the south site area. Following up at least in part on this last recommendation, MWAC personnel conducted a magnetic survey of the south site area in 2006, which could serve as the basis for any future testing work in this part of the site (De Vore 2008).

Project Personnel and Contributors

The Elbee testing project was conducted as part of the 2010 UND summer archeological field school. Dr. Dennis L. Toom, UND adjunct professor of anthropology, was the field school instructor. Michael Jackson, UND associate research archeologist, was the assistant field school instructor and provided specific student instruction regarding the use of electronic mapping instruments. Megan Lonski, Madisson Whitman, and Cynthia Kordecki, professional archeological assistants at UND, assisted Toom in the field with various tasks at various times. Albert LeBeau of the MWAC staff served as the on-site liaison for the NPS and was an assistant supervisor. Field school students who participated on the project were: Meredith Bergen (Roger Williams University), Sarah Fred (Boston University), Amelia Gagnon (University of North Dakota), Kevin Gubbels (University of North Dakota), Rebecca Hanson (University of North Dakota), Elizabeth Hunter (University of North Dakota), Charlotte Padden (Brandeis University), Siobhan Quinn (University of North Dakota), Nathan Rokke (University of North Dakota), Michael Storey (University of North Dakota), and Ryan Walker (University of North Dakota).

Jane Monson did the basic laboratory processing and inventory work for the Elbee and Karishta collections. Dennis Toom, the project principal investigator and senior report author, did most of the artifact and material analysis work. Michael Jackson did the vertebrate faunal identification work and prepared the sections on vertebrate fauna in the report. Jackson also performed the radiocarbon date calibrations and statistical analyses, and he compiled data tables for the report from project databases. Carrie Jackson assembled and proofed the final report.

Agency Coordination and Consultation

All phases of the project were done in close coordination with NPS personnel. Jay Sturdevant handled project matters at MWAC. Maureen McGee-Ballinger, chief of interpretation and cultural resources, and Brian McCutchen, park superintendent, were the main project contacts at KNRI. As noted previously, KNRI personnel handled tribal consultation issues with representatives of the Mandan, Hidatsa, and Arikara Nation, as well as project consultation with the North Dakota State Historic Preservation Office (State Historical Society of North Dakota).

Disposition of Artifacts and Records

The 2010 archeological collection from Elbee and all related documentation will be housed at the Knife River Indian Villages National Historic Site, Stanton, North Dakota, under Accession No. KNRI-00245. The site collections were re-cataloged into the Interior Collections Management System (ICMS), using ICMS software, for purposes of curation at KNRI. Other archeological collections and documentation pertaining to KNRI sites also are housed on-site at the park in the main administration building and visitor center.

Report Organization

The Elbee report is organized into eight chapters and a number of supporting appendices. Following this introduction, Chapter 2 presents information on the research design that guided the fieldwork and the subsequent laboratory processing and analysis of recovered materials. Chapter 3 details the fieldwork that was completed at the site and characterizes the physical stratigraphy encountered in the excavations. Detailed information on artifact and other analyses and the basic findings of the project are presented in Chapter 4 for the Elbee site and Chapter 5 for the Karishta site. Chapter 6 covers the salient findings of the investigations in terms of archeological research topics identified in the research design. The project is summarized in Chapter 7, which also contains recommendations for future work as well as other observations on the sites under study. References

cited are listed in Chapter 8. Finally, ancillary data reports, computer coding formats, computer databases, and other information are presented as appendices at the end of the report or in electronic format on the CD-R attached to the inside back cover of the report.

Chapter 2
RESEARCH DESIGN

General Research Objectives

Evaluative archeological test excavations are often concerned primarily with management research goals. To this end, information is generated on the age, cultural-historical affiliation, function, artifact content, boundaries (horizontal and vertical), integrity, and research potential of the sites being evaluated, insofar as is possible by the extent of the fieldwork and the inherent limitations of the sites themselves. These data constitute the basis for evaluating the site significance and assessing eligibility for listing on the National Register of Historic Places (Little et al. 2000; NPS 1998), or clarifying certain issues such as boundary definition. Standard archeological documentation and analysis techniques are typically employed in the acquisition of this information, as discussed in subsequent sections.

An integral part of the National Register process involves the development of recommendations or management plans that are concerned with the mitigation of present and perceived future impacts to significant cultural resource sites. Measures directed at the preservation of significant archeological sites are always preferred, but it is recognized that preservation is not always practical or cost effective. In such instances, it may be necessary to recommend data recovery (excavation) as the only viable management option. In this regard, management recommendations and recommendations for future research are developed for the Elbee and Karishta sites.

In addition to management objectives, the scientific objectives of cultural resources studies revolve around the generation of information on aspects of human history, including prehistory, and the physical record of human behavior with respect to the sites under study, their deposition and environmental contexts, and their relationships to relevant cultural complexes. General research topics of primary interest in contemporary archeological studies, at least those that are grounded in cultural materialism, are divisible into five main groups: (1) chronology and culture history, (2) cultural reconstruction (settlement and subsistence patterns), (3) cultural interaction, (4) environmental reconstruction, and (5) cultural ecology. These general topics are compatible with more specific research domains outlined in *The North Dakota Comprehensive Plan for Historic Preservation: Archeological Component* (SHSND 1990, 2008). The scale, or size, of the excavation project, its scope and level of funding, as well as the quality of the archeological site itself, will determine to what extent such research topics can be addressed. Nevertheless, any such project must be capable of advancing our knowledge of the past in at least some of these areas if we are to gain anything by its conduct. Survey, or inventory projects generally make the least contribution to scientific studies; evaluative test excavation projects typically make a middle range contribution; and data recovery (large-scale excavation, or mitigation) projects usually make the highest contribution to science. Because the present project is largely concerned with archeological testing, its scientific contributions will be limited.

General Excavation Design

Small, 2-x-2-meter (m) block excavations were planned for the Elbee site because the location of archeological features was a primary goal of the fieldwork to be conducted at this site. Smaller test units probably would not be large enough to precisely find medium-sized archeological features, such as hearths and pits, or to fully uncover them. Moreover, the presence of larger features, such as house floors, can be difficult to recognize in smaller excavations, especially if the houses had not burned. Smaller 1-x-1-m or 1-x-2-m test units were planned for Karishta because of the largely exploratory nature of the fieldwork to be done there.

Horizontal provenience within the block units was minimally maintained according to standard 1-x-1-m excavation unit (XU) squares. Vertical provenience was maintained in standard 10 cm arbitrary levels. Features were to be dug according to their unique shapes as a single excavation unit. Plowzone sediments were passed through one-quarter-inch mesh hardware cloth screens. Feature sediments were subjected to a combination of one-sixteenth-inch water screening and very-fine-mesh flotation screening.

The bulk of the sediments from features were to be water screened, with a generous portion retained for flotation processing in the lab. All materials remaining in the screens were retained for examination and sorting under laboratory conditions; field sorting of screened materials was not done.

A separate field catalog number was assigned to each individual provenience unit (square and level, feature, or plotted artifact) that was defined and excavated or collected at a site. Field catalog numbers serve to label and track material while in the field, and they form the basis of the laboratory cataloging system subsequently used in the lab for this same purpose. The field catalog itself contains all basic locational and descriptive data pertaining to a particular catalog number (excavated or collected provenience). In addition, detailed information on each completed excavation unit (square and level or feature) was recorded on standard forms and cross-referenced by field catalog numbers. Catalog numbers were assigned sequentially as the fieldwork progressed at the site. The excavations were photographed periodically as the work progressed. All features and test unit profiles were photographed and drawn, as were any particularly interesting artifacts found in situ, particularly time-diagnostic artifacts.

General Site Mapping Procedures

UND Anthropology Research relies almost exclusively on electronic means for its archeological site mapping endeavors, however, sometimes circumstances dictate the use of simpler, non-electronic methods. Electronic site mapping is conducted in reference to Universal Transverse Mercator (UTM) coordinates, based on the metric system, obtained through the Global Positioning System (GPS). All UTM coordinates at Elbee and Karishta were acquired with a Differential GPS (D-GPS) receiver that records differentially corrected GPS/UTM coordinates in the field that are accurate, under ideal conditions, to within $\pm$1 m. Previously established permanent datums were used for data control and to relate new map data to existing maps. For Elbee, permanent datums T-5 and T-6 were used for these purposes, as illustrated on earlier site maps (e.g., Ahler ed. 1984:8).

For high precision site mapping, a Sokkia Set 5 total station and Sokkia SDR33 external data collector were used to acquire topographic and archeological point data that are accurate to within $\pm$5 mm. Point data recorded by either the D-GPS receiver or total station were downloaded to a computer, and various software programs were used to produce detailed and highly accurate archeological site maps. Because the Elbee site area had been mapped in detail before using high precision aerial photogrammetry, collection of new map data was kept to a minimum, mainly to document the present Knife River cutbank location and to tie in the excavation grid and assign UTM coordinates. The excavation grid employed at the Elbee site was the same as that established for the 2002 magnetometer survey of the northern site area (Volf 2002) and the follow-on 2003 test excavations (Toom et al. 2004). The Karishta test units were dug off-grid to provide maximum flexibility in their placement and orientation within the much smaller site area. The Karishta tests were later mapped by total station and tied into the Elbee excavation grid so that they could be placed with high precision on the site locality KNRI base map.

Basic Laboratory Processing Procedures

Recovered materials were processed and inventoried (cataloged) employing a standardized set of laboratory procedures. For the sake of consistency, these procedures are essentially the same as those used for virtually all excavation projects conducted by UND for various public agencies and private concerns, including the National Park Service, and they are virtually identical to the procedures used for the 2003 excavation project at Elbee (Toom et al. 2004).

Individually provenienced collections, each designated by a unique laboratory catalog lot number (i.e., the field catalog number), were first washed (if necessary), then size graded, sorted, and quantified. The one-quarter-inch dry screened materials from the site were routinely washed, but water screened and flotation materials only rarely require washing. Sorted materials from each provenience unit were kept together until basic quantitative data were recorded for all individual classes.

Size grading was accomplished using a mechanical aggregate shaker with nested wire mesh screens. The five screens used for size grading have the following size openings and size grade designations:

- G1 - Grade 1 = 25.0 mm (1 inch)
- G2 - Grade 2 = 12.5 mm (0.5 inch)
- G3 - Grade 3 = 5.6 mm (0.223 inch)
- G4 - Grade 4 = 2.80 mm (0.110 inch)
- G5 - Grade 5 = 1.18 mm (0.046 inch)

Larger-sized materials were hand-manipulated through the size grade 1 and 2 (G1 and G2) screens to ensure proper distribution. The smaller-sized materials in size grades 3-5 (G3, G4, and G5) are mechanically shaken for about 30 seconds through the screens. The minimum screen size used was, of course, set in the field by the selection of the field recovery screen for a particular excavation unit or fraction thereof.

The process of size grading produces a set of standard-sized lots of material from each basic excavation unit (square and level or feature). Subsequent sorting and quantification operations are guided by these size divisions. Size grade data have considerable utility. They can be used to bolster inferences regarding human behavior and site formation processes based on mass analysis techniques. They also provide convenient cutoff points for sorting recovered materials into artifact and other material classes.

Sorting was the next step in material processing. All artifacts and other recovered materials were separated into material groups and more specific artifact classes following uniform guidelines (Table 2.1). Recent organic debris such as insect parts, roots, twigs, and grass were removed and discarded. After each individually provenienced sample is sorted, artifacts and materials from each class were packaged separately, some by lot and some individually, in plastic bags. All sorted materials and residues are rebagged by provenience while awaiting a check of the initial sort.

Quantification involves the recording of counts and/or weights for all items in all artifact and material classes by size grade. Standard forms are used to record this information for each catalog lot number. These basic quantitative data are then entered into computer database files to compile artifact inventory data and expedite artifact distributional analyses. All materials recovered from the Elbee and Karishta sites, both artifactual and non-artifactual, were retained for inclusion in the permanent site collection at the request of the NPS.

Master Databases and Provenience Keys

Master databases were compiled for the 2010 Elbee and Karishta collections using Microsoft Access® software. The purpose of the databases is to provide easy access to data on artifacts and other recovered materials, as well as associated provenience data, and to compile summary data tables for purposes of reporting. The master databases are reproduced on the enclosed CD-ROM, attached to the inside back cover of the report.

Within each database are computerized provenience keys (datatables) for the Elbee and Karishta sites, which were developed to enable better control over the excavation unit data pertaining to the two sites. The provenience keys are constructed around the UND field catalog numbers, which are also used as UND laboratory catalog numbers, and include information on location, recovery, and context for all excavated provenience units. The provenience key computer codes and data for the Elbee and Karishta sites are listed in Appendix C (on CD-ROM).

Table 2.1. Sorting Specifications for Dry Screened and Water Screened Excavation Samples, Elbee Site (32ME408) and Karishta Site (32ME466), 2010 UND Fieldwork.

Material or Artifact Groups in First Sort	Material or Artifact Classes in Second Sort	Size Grade Sorted From[a]				
		G1	G2	G3	G4	G5
Chipped or Ground Modified Stone	Stone Tools	X	X	X	X	
	Chipped Stone Flaking Debris	X	X	X	X	
	Pipestone (Catlinite) Debris	X	X	X	X	X
Native Ceramics (Pottery)	Rim Sherds	X	X	X		
	Body Sherds	X	X	X		
	Other (e.g., ball, bead, figurine)	X	X	X		
Vertebrate Fauna (Bone)	Modified Bone	X	X	X	X	X
	Unmodified Identifiable Bone	X	X	X	X	TE
	Unmodified Unidentifiable Bone	X	X	X		
Shell	Modified Shell	X	X	X	X	X
	Unmodified Identifiable Shell	X	X	X		
	Unmodified Unidentifiable Shell	X	X	X		
Fire-Cracked Rock	Check for Tools	X	X	X		
Natural Clinker (Scoria)	Check for Tools	X	X	X		
Burned Earth		X	X	X		
Fired Clay		X	X	X		
Ash (Consolidated)		X	X	X		
Ochre/Pigment		X	X	X		
Miscellaneous Native American Material	Glass Trade Beads	X	X	X	X	X
	Other Trade Glass	X	X	X	X	ID
	Trade Metal	X	X	X	X	ID-C
	Other	X	X	X	X	ID
Miscellaneous European American Material	Glass	X	X	X	X	
	Ceramics	X	X	X	X	
	Metal	X	X	X	X	
	Other (e.g., coal clinker)	X	X	X	X	
Floral/Botanical	Wood/Charcoal	X	X	X		
	Seeds (Burned)	X	X	X	X	
Natural Rock		X	X	X		
Unsorted Residue					X	X

[a]Size grades G1, G2, and G3 apply to one-quarter-inch dry screen samples; size grades G1, G2, G3, and G4 apply to 2-mm water screen samples; all five size grades apply to one-sixteenth-inch water screen samples.

Table Abbreviations:
TE = teeth only (complete cranial elements).
ID = typically identifiable objects only; formed or worked specimens, not amorphous pieces or scraps.
ID-C = identifiable objects and copper (Native American trade metal).

Artifact Inventories

The master databases for the Elbee and Karishta sites also contain inventory (quantification) datatables for all artifacts and other recovered materials. The inventory data are keyed to the appropriate provenience data by field catalog number in these relational databases. Artifact and other material inventory codes are listed in Appendix D (on CD-ROM).

Basic Artifact Analysis Procedures

Selected artifact classes such as stone tools, flake debris, ceramics, and identifiable faunal and floral remains are subjected to more rigorous, detailed analytical procedures on a routine basis than the simple size grading and quantification described above. Analytical procedures for other, less common classes of artifacts are developed on a case-by-case basis. The detailed analytical systems used for most studies are discussed in the following paragraphs. Coding formats for the more intensively studied artifact classes, such as native ceramics, stone tools, and identifiable animal bone, are listed as appendices on the enclosed CD-ROM. Analytical artifact data are listed in the Microsoft Access® master databases, also on the enclosed CD-ROM attached to the inside back cover of the report.

Native Ceramics

The analysis and coding of native ceramics, or pottery, follows from the ceramic analysis methods used for the James River archeological projects (Toom 2002). Analysis of native ceramics begins by separating these artifacts into rim sherd and body sherd groups, representing portions of ceramic vessels, and "other" ceramic objects, which tend to be rare. Body sherds are maintained in their size grade class for further analysis, with the exception of body sherds that can be conjoined with rim sherds. Rim sherds are treated on an individual basis. All individual rim sherds are matched in an attempt to identify rims from the same ceramic vessel. Matches consist of both direct fits between conjoinable rims and unjoined rims that are basically similar in form, decoration, and paste. Matched rims and single rims without a match are then referred to as vessels and are numbered accordingly.

Rim sherds representing pottery vessels are computer coded to facilitate analysis. The ceramic vessels (matched rim sherds) in the collection are described and classified where possible according to established wares and types. To this end, the Middle Missouri ceramic key compiled by Johnson (1980), the Knife-Heart region ceramic coding manual put together by Ahler and Swenson (1985a), and the article on Northeastern Plains Village pottery by Michlovic and Swenson (1998) are useful sources in structuring the description, classification, and analysis of Plains Village period ceramics. Another useful source containing general guidelines on reporting Plains ceramics is Johnson et al. (1991). Primary variables used to classify rim sherds and vessels under these systems include: (1) rim form, (2) lip form, (3) exterior surface treatment, (4) area of decoration, (5) decoration technique, and (6) decoration motif.

Body sherd surface treatments are recorded for size-grades 1-2 (G1-2) specimens as part of the ceramic analysis process. Grade 3 specimens are typically excluded from this procedure because they are often too small for a definite determination of surface treatment. However, surface treatment of G3-sized sherds may be recorded if sufficient numbers of larger sherds are not present in a collection. Surface treatment data are useful in distinguishing among the various archeological taxa of the ceramic period in the Northern Plains region when viewed in conjunction with vessel ware and type information.

Maximum thicknesses of G1-2 body sherds also are recorded so as to arrive at a simple, consistent value (mean maximum thickness) for purposes of making between-site comparisons. Body sherd thickness has been shown to be a temporally sensitive variable in certain cases (e.g., Ahler and Weston 1981:183-185; Toom 2003). Its systematic measurement here is intended to add to available data on the relationship between time and body sherd thickness for Northern Plains ceramic assemblages.

Stone Tools

Stone tools were individually computer coded using an adapted version of the coding scheme applied to the Big Hidatsa Village site (Ahler and Swenson 1985b:79-84), as updated for the laboratory manual for the Lake Ilo project (Root et al. 1999). The variables recorded for all stone tools include: (1) descriptive category, (2) computer sequence number, (3) technological class, (4) morphological class, (5) functional class, (6) use-phase (or use-life) class, (7) raw material type, (8) burning, (9) heat treatment, (10) patination intensity, (11) recycled, (12) multipurpose (multifunction), (13) cortex, (14) completeness, and (15) weight in grams. Additional comments on important aspects of the stone tool analysis follow.

The main thrust of the stone tool analysis is the determination and interpretation of tool function(s). The initial placement of stone tools in various descriptive categories is simply a means of organizing the tools according to general technological and morphological characteristics for purposes of further study. Descriptive categories in and of themselves are not considered to be useful analytic groups, although they do provide concise information on the makeup of a collection. A four-digit sequence number is assigned to each tool within the descriptive categories. This number, in combination with the descriptive category code, forms a six-digit number referred to as the "computer number." Computer numbers provide each tool with a unique identifying number.

Technological classes are a means of describing "a general technological trajectory or suite of technological permutations often applied in a complex fashion to produce a desired end product" (Ahler and Swenson 1985b:82). In essence, technological classes provide succinct information on simple as well as complex stone tool manufacture operations and probable manufacture pathways. Morphological classes, most of which relate to various projectile points and other patterned tool types, are an attempt to succinctly capture the form of various tools and tool fragments. Other than projectile point forms, morphological classes receive little analytical attention.

The functional classification of stone tools is a complex operation involving macromorphological and micromorphological observations (e.g., see Ahler 1979). Specific functional classes provide detailed information on tool use and tool work material. These specific functional classes are collapsed into a number of general functional groups to facilitate summarization and intersite comparisons. Detailed definitive information on the specific functional classes can be found in Ahler and Swenson (1985b:329-341). The specific class composition of the general functional groups is listed in updated form in Root et al. (1999).

Use-life, or use-phase, classification places each tool in one of four groups that provide information on its probable position in the manufacture-use-discard trajectory. The four use-phase classes, as presented in Ahler and Swenson (1985b:81), are: (1) unbroken, potentially useful, manufacture incomplete; (2) broken or rejected, manufacture incomplete; (3) unbroken, potentially useful, manufacture complete; and (4) broken, exhausted, or rejected, manufacture complete. The number preceding each use-phase class is its code or numerical designation for purposes of tabular presentation of use-phase data.

Raw material analyses are primarily concerned with the identification of local and nonlocal (exotic) lithic resources, and the determination of lithic resource utilization patterns for various archeological taxa. It is therefore necessary to approach raw material analyses from a regional or areal perspective in order to distinguish among local and distant resources. Considerable use is made of the UND lithic type comparative collection in identifying the raw material types within a particular collection. Lithic raw material types applied to the Big Hidatsa Village collection are detailed in Ahler and Swenson (1985b:342-347); updated lithic raw material type definitions can be found in Root et al. (1999).

The data thus acquired on the stone tool assemblage from the site are used to determine the basic activity structure of the site, which are in turn used in interpretations of overall site function. The quantities and kinds of local versus exotic lithic raw material types in the assemblage are used to make inferences regarding territoriality and possible trade relations.

Flake Debris

After initial size grading, sorting, and quantification, the flake debris samples are analyzed and requantified according to size grade and raw material type. As with the tools, the UND lithic type comparative collection forms the basis for the raw material identifications. Counts and weights of flakes for each identified lithic raw material type are recorded for each size grade lot by catalog number. These data are recorded in a computer database table.

The flake debris size grade data are used to determine the technological derivation of the debitage sample from the site using a technique referred to as "mass analysis." Mass analysis allows for a relatively quick and accurate interpretation of general tool production technology at a site by analyzing flaking debris en masse, rather than piecemeal, through comparisons to experimental data (see Ahler

1989; Ahler and Christensen 1983). Mass analysis has certain advantages over individual flake analysis in terms of analytical economy, and it has been proven accurate in determining general stone tool manufacturing procedures for a particular site collection.

Identifiable Faunal and Botanical Remains

Analysis and coding of modified and unmodified, identifiable vertebrate faunal remains (i.e., animal bone) generally follows the methods described for the James River archeological projects (Bozell 2002). Comparative faunal and botanical reference collections and reference books are used to make species identifications for the specimens in the collection that are complete enough to identify with certainty. Botanical (seed) identifications are typically made only on materials from archeological features (i.e., contained contexts) as the floodplain and terrace settings of most sites makes the introduction of extraneous, non-archeological botanical materials highly likely. The data thus acquired are used to interpret subsistence practices at the site. Furthermore, the identification of exotic faunal materials, particularly shell, and determining their source or point of origin, is used to suggest trade relations and patterns of regional interaction for the occupants of the site.

Chapter 3
FIELDWORK AND STRATIGRAPHY

Introduction

The research design for the test excavation work at the Elbee and Karishta sites included site mapping and test excavation tasks. In addition, the high Knife River cutbank was examined for exposures of features and other artifacts. The test excavation work was coordinated with the findings of new geophysical (magnetometer and electrical resistivity) surveys conducted by NPS personnel and reported elsewhere. The main objectives of the Elbee site investigation and evaluation program were to (1) determine if the main village component was present in the far northern part of the site, as indicated by the presence of archeological features, (2) salvage what remained of the hearth feature exposed in the Knife River cutbank, and (3) examine the Knife River cutbank for more deeply buried, earlier archeological components in the northern part of the site. If time allowed, it was also planned to conduct limited testing in the southern part of the Elbee site, which had not been heretofore tested. The main objectives of the Karishta investigation program were much more modest and consisted of confirming the location of the Karishta site via limited testing and assessing its archeological content.

In order to accomplish these objectives, five large test units were dug at Elbee in 2010, designated Excavation Units 5-9 (XU5-9). (Excavation Units 1-4 were dug at the site in 2003; see Toom et al. 2004.) Each XU was a 2-x-2-m block of four squares that were dug to varying depths depending on their location within the site. XU5 was dug at what was now the northern end of that part of the site that occupied the surface of the A terrace, the same landform where the 2003 units (XU1-4) were dug. XU6, XU7, and XU8 were dug in the far northern part of the site, into the B terrace remnant. These units were placed in the vicinity of the hearth exposure that had attracted attention to this untested part of the site. XU9 was dug in the south site area to test this part of the site (Figure 3.1). XU7, XU8, and XU9 were placed over geophysical anomalies thought to be the locations of archeological features; XU6 was placed at the confirmed location of an archeological feature, the hearth exposed in profile in the cutbank, which was designated Feature 201 (F201). Excavated volume for Elbee in 2010 totaled about 10.20 m^3. This breaks down to around 1.20 m^3 for XU5, 3.60 m^3 for XU6, 1.80 m^3 for XU7, 2.40 m^3 for XU7, and 1.20 m^3 for XU9 (Table 3.1).

Three 1-x-2-m test units were dug at Karishta, with each test comprised of two XU squares of 1-x-1-m each (Figure 3.1). Accordingly, the first test was designated XU1-2, the second test was designated XU3-4, and the third test was designated XU5-6. This somewhat different XU square approach was used at Karishta because the tests were dug off-grid to provide greater flexibility in unit placement and orientation. Excavated volume for Karishta in 2010 totaled about 2.60 m^3 (Table 3.2).

Detailed Site Mapping and Geophysical Surveys

The Elbee and Karishta sites have been both mapped in detail by aerial photogrammetric methods (Figure 1.2). The existing map of the two sites was used as a base map for the present project in order to precisely locate excavation units and identified archeological features (Figure 3.1). The Knife River cutbank at the site was remapped in detail in 2010 and was added to the base map to check on the progress of erosion. High-precision map data were taken using a total station electronic mapping instrument (Sokkia model Set 5F). Additional map data were collected using a differential global positioning system (D-GPS) unit (Trimble model GeoXT) in order to convert coordinates to the universal transverse mercator (UTM) system.

The excavation grid for the Elbee site is the same as that used for the magnetometer survey conducted by NPS-MWAC personnel in the fall of 2002 (Volf 2002) and for the 2003 UND test excavations (Toom et al. 2004). The datum for this grid was set at point 500NE500, located just inside the fence and immediately north of the roadway entering the site (Figure 3.1). All excavation unit grid coordinates stated in the present report are in reference to this datum. NPS-MWAC personnel conducted additional geophysical surveys at the Elbee site in 2006 (De Vore 2008) and again in the spring of 2010.

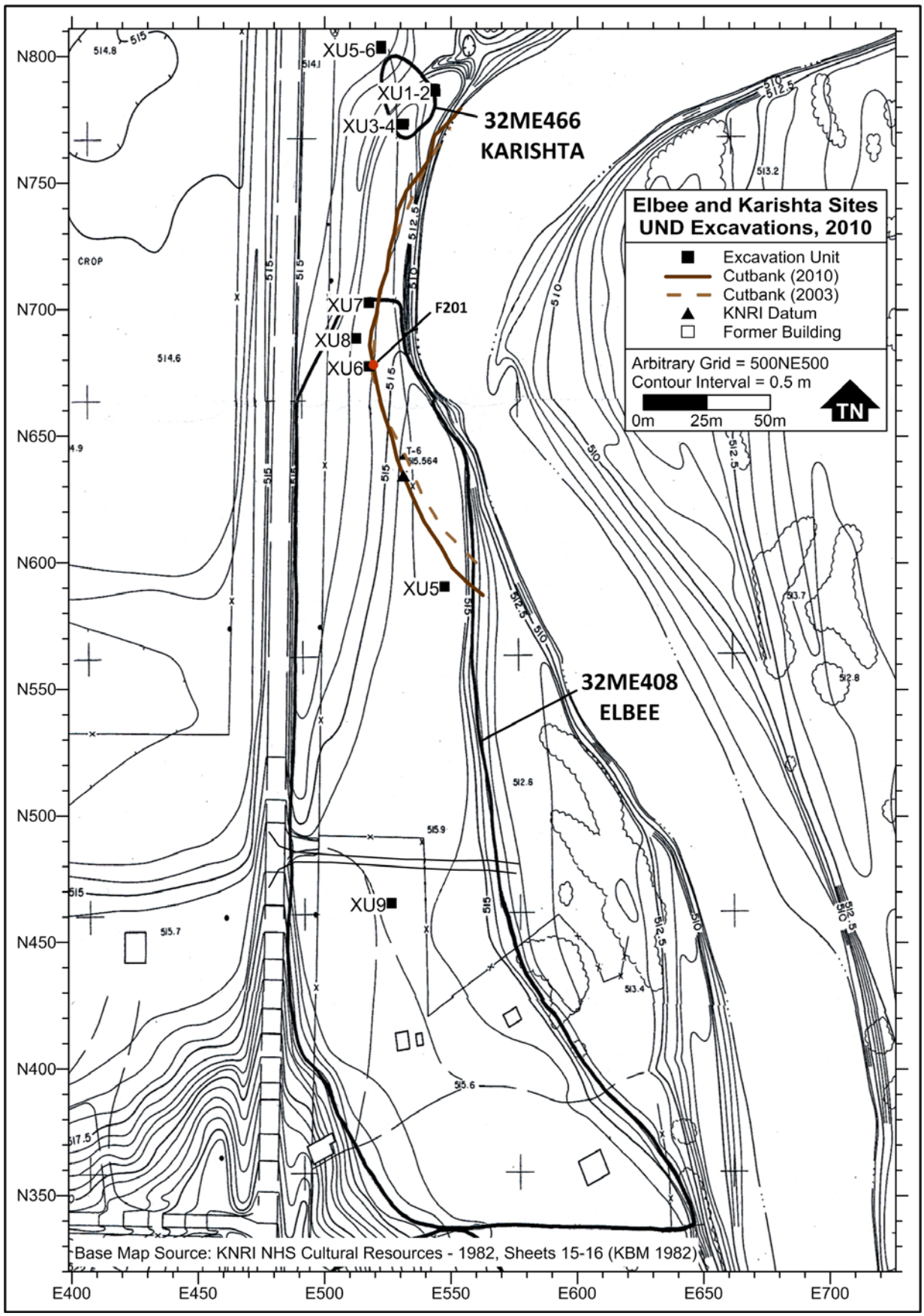

Figure 3.1. Contour map of the Elbee Site (32ME408) and Karishta Site (32ME466) excavations, 2010 UND Fieldwork.

Table 3.1. Excavation Unit Summary Data, Elbee Site (32ME408), 2010 UND Fieldwork.

Excavation Unit	Square Coordinates	General Level or Feature	Depth Range (cm sd)	Number of Levels	Excavated Volume (m^3)
XU5	590NE547	General Level	0-30	3	0.30
	590NE548	General Level	0-30	3	0.30
	591NE547	General Level	0-30	3	0.30
	591NE548	General Level	0-30	3	0.30
	Subtotal, XU5				1.20
XU6	677NE517	General Level	0-90	9	0.90
	677NE518	General Level	0-90	9	0.90
	678NE517	General Level	0-90	9	0.90
	678NE518	General Level	0-90	9	0.90
	Subtotal, XU6				3.60
XU7	702NE517	General Level	0-60	6	0.60
	702NE518	General Level	0-60	6	0.60
	703NE517	General Level	0-60	6	0.60
	703NE518	General Level	0-60	6	0.60
	Subtotal, XU7				1.80
XU8	688NE512	General Level	0-70	7	0.70
	688NE513	General Level	0-70	7	0.70
	689NE512	General Level	0-50	5	0.50
	689NE513	General Level	0-50	5	0.50
	Subtotal, XU8				2.40
XU9	465NE526	General Level	0-30	3	0.30
	465NE527	General Level	0-30	3	0.30
	466NE526	General Level	0-30	3	0.30
		Feature 203	30-34	1	N/a
	466NE527	General Level	0-30	3	0.30
		Feature 202	30-45	1	N/a
	Subtotal, XU9				1.20
	Grand Total				10.20

Table 3.2. Excavation Unit Summary Data, Karishta Site (32ME466), 2010 UND Fieldwork.

Excavation Unit	Square Coordinates	General Level or Feature	Depth Range (cm sd)	Number of Levels	Excavated Volume (m^3)
XU1-2	XU1 (off grid)	General Level	0-40	4	0.40
	XU2 (off grid)	General Level	0-40	4	0.40
	Subtotal, XU1-2				0.80
XU3-4	XU3 (off grid)	General Level	0-50	5	0.50
	XU4 (off grid)	General Level	0-50	5	0.50
	Subtotal, XU3-4				1.00
XU5-6	XU5 (off grid)	General Level	0-40	4	0.40
	XU6 (off grid)	General Level	0-40	4	0.40
	Subtotal, XU5-6				0.80
	Grand Total				2.60

The 2010 geophysical work at Elbee, which is to be reported under separate cover by NPS-MWAC personnel, was done in support of the archeological excavations reported herein (De Vore 2011).

Elbee Test Unit and Feature Excavations

As mentioned above, five 2-x-2-m excavation units (XUs) were dug at the Elbee site in 2010. XU5 and XU9 were shallow units dug into the surface of the A terrace, within the bounds of the main earthlodge village occupation (Figure 3.2). Previous excavations at the site also were placed within the A terrace village (Ahler ed. 1984; Toom et al. 2004). XU6, XU7, and XU8 were deep units dug in the far northern part of the site, into the B terrace remnant that contains a rather deep stratigraphic sequence of relatively recent alluvial sediments (Figure 3.3). This part of the site had not received any prior excavation work. The Knife River channel cuts directly against the eastern margin of the B terrace remnant, as well as the north end of the A terrace, both of which are being actively eroded. XU7, XU8, and XU9 were placed over or near the locations of geophysical anomalies, suspected to mark the locations of archeological features such as pits or hearths, as indicated by the 2010 NPS-MWAC geophysical survey data. XU5 and XU6 were located without regard to geophysical anomalies, but with other goals in mind.

The maximum unit of horizontal provenience used during excavation was the 1-x-1-m square. The main vertical provenience units consisted of 10 cm arbitrary levels. Archeological features were excavated as single units without the use of vertical levels. All recovered materials were transported to UND archeology laboratory facilities in Grand Forks for processing, inventory, and analysis work. Field sorting of screened materials was not done. Field cataloging, standard excavation forms, and digital photography were used to document the excavation work. Detailed stratigraphic profiles were made of selected excavation unit walls and of the cutbank profile around F201. Features were excavated as separate units and documented accordingly. All excavation units were backfilled upon completion, except for XU6, which was left open for a period of time, at the request of the NPS, and then backfilled by KNRI personnel.

A Terrace Units (XU5 and XU9)

On the A terrace surface, the squares comprising the two shallow excavation units, XU5 and XU9, were dug in 10 cm arbitrary levels, down to 30 cm surface depth (sd), through the plow zone and into underlying, intact sediments of the surface A or AB horizon (Figure 3.4). The Plains Village deposits blanketing the A terrace, mainly contained within the plow zone, were fully penetrated at this depth, excepting, of course, sub-plow zone village features. Excavated matrix from each level of each square was dry screened through one-quarter-inch-mesh hardware cloth screens. All materials remaining in the screens were bagged and retained for laboratory processing and analysis. It should be noted that both XU5 and XU9 produced a number of artifacts dating to recent historic times. These recent historic artifacts undoubtedly derive from the Russell farmstead occupation, especially in the vicinity of XU9 in the south site area, where the farmyard buildings were located.

Excavation Unit 5. XU5 was placed at the northern end of the main village area, on the A terrace, to provide additional information on this part of the site, which also is being actively eroded by the Knife River. XU5 was a 2-x-2-m block that consisted of squares 590NE547, 590NE548, 591NE547, and 591NE548 (Figure 3.5). All of the XU5 squares were dug to a uniform depth of 30 cm sd, as measured by line level from the southwest corner of the unit. No features were uncovered in XU5, which was largely unremarkable, except that it did produce appreciable amounts of Plains Village age artifact debris, mainly from the plow zone (Figure 3.6).

Excavation Unit 9. XU9 was placed at the opposite end of the A terrace, in the southern part of the site, over a geophysical anomaly. In addition to investigating the anomaly, the purpose of the unit was to begin testing the archeological content of the southern site area. XU9 was a 2-x-2-m block that consisted of squares 465NE526, 465NE527, 466NE526, 466NE527 (Figure 3.7). All of the XU9 squares also were dug to a uniform depth of 30 cm sd, as measured by line level from the southwest corner of the

a

b

Figure 3.2. Photographs of the Elbee site excavations. a: XU5 at the north end of the A terrace, northwest view (KNRI-10-013). b: XU9 at the south end of the A terrace, southeast view (KNRI-10-098).

a

b

Figure 3.3. Photographs of the Elbee site excavations. a: XU6, 7, 8, on the B terrace, right. XU5 on the A terrace, left, south southwest view (KNRI-10-022). b: XU6, 7, 8 on the B terrace from the A terrace, northwest view (KNRI-10-049).

a

b

Figure 3.4. Photographs of the Elbee site excavations. a: XU5 under excavation, southwest view (KNRI-10-066). b: XU9 under excavation, southeast view (KNRI-10-197).

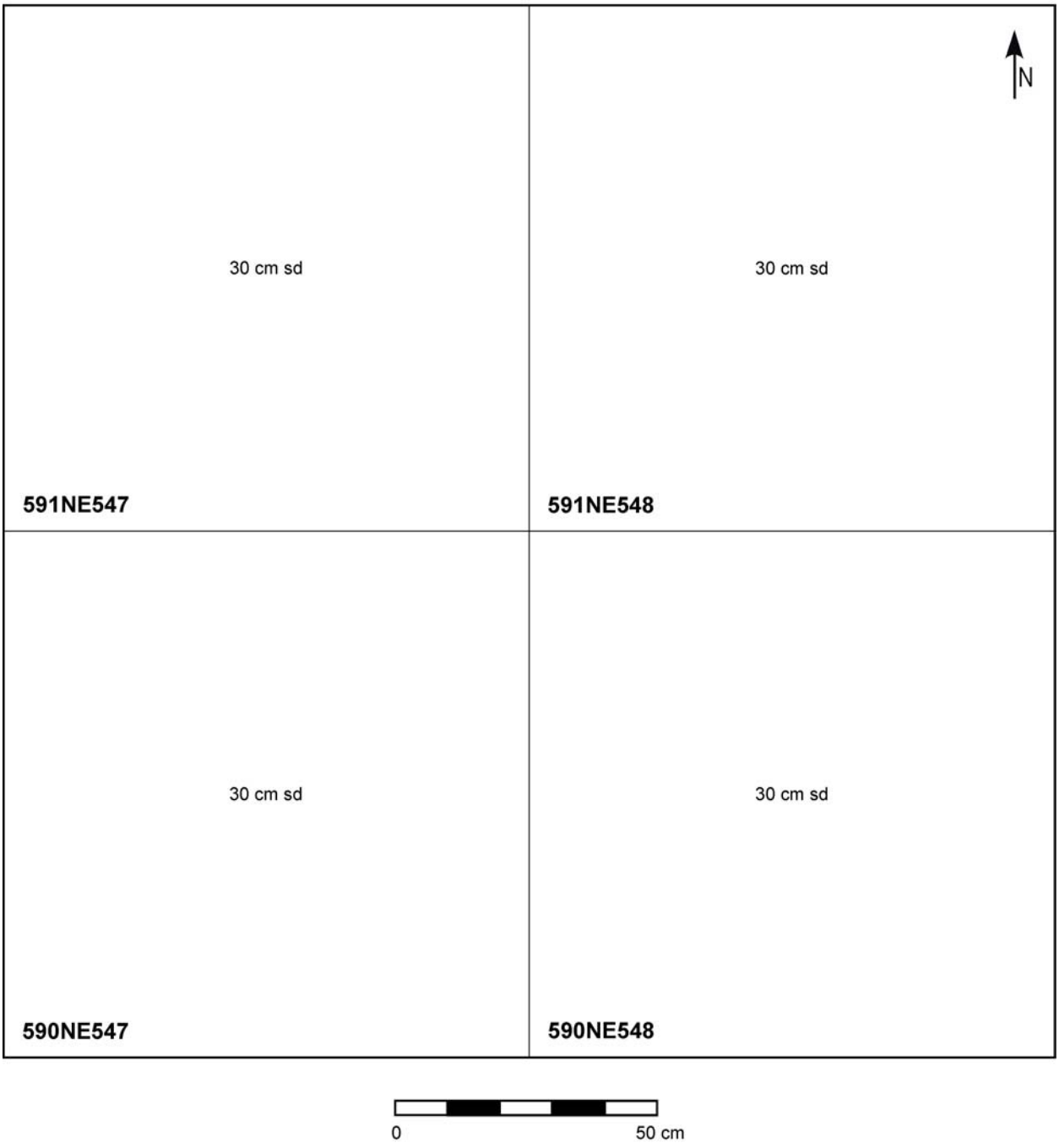

Figure 3.5. Plan map of XU5, Elbee site.

a

b

Figure 3.6. Photographs of the Elbee site excavations. a: XU5 excavation finished, south view (KNRI-10-129). b: XU5 excavation finished, southwest view (KNRI-10-135).

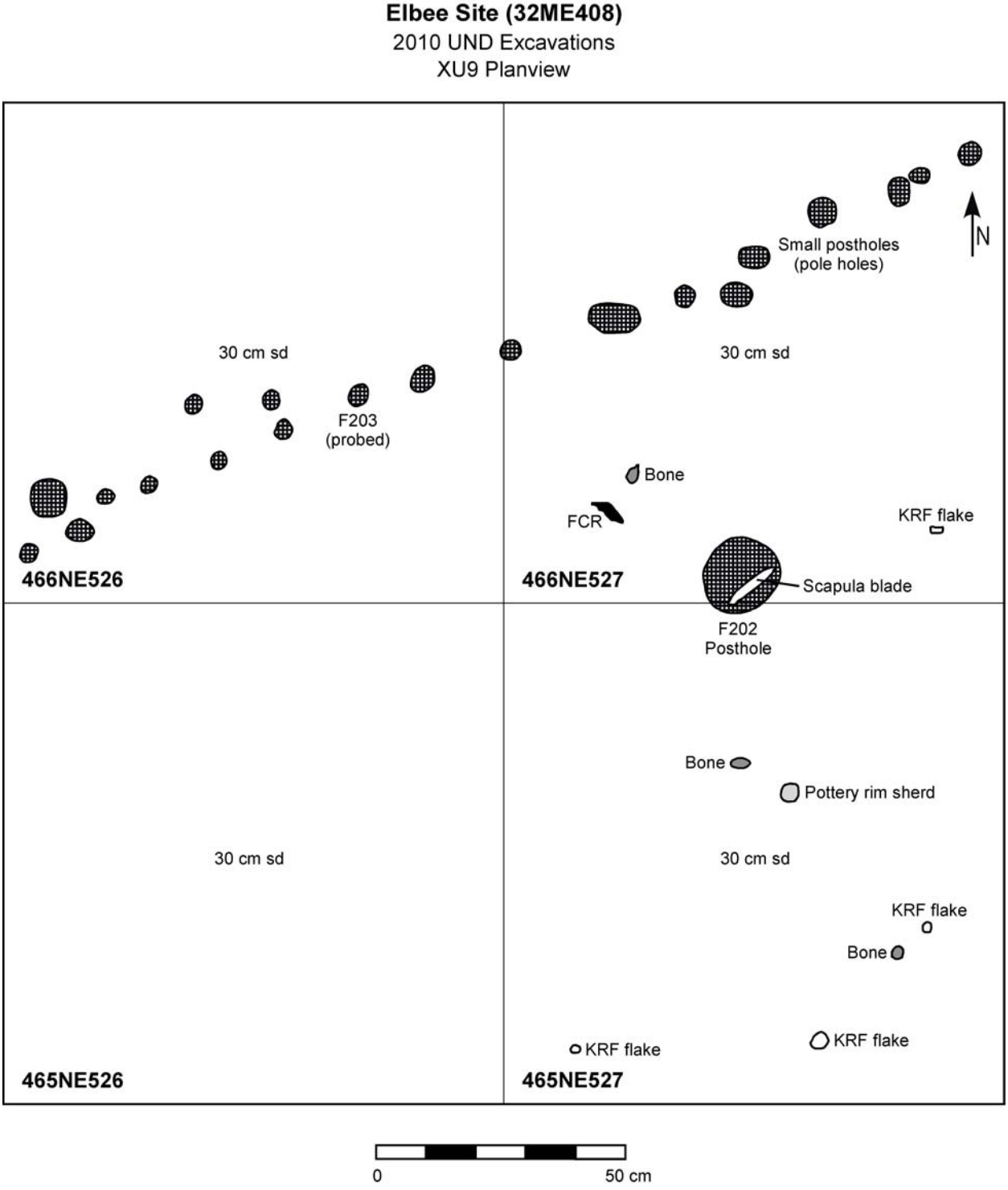

Figure 3.7. Plan map of XU9, Elbee site.

unit. This A terrace unit also produced considerable numbers of Plains Village age artifacts, as well as an interesting array of features beneath the plow zone that might represent interior features of an earthlodge.

Intact portions of archeological features were found beneath the A terrace plow zone in XU9 (Figure 3.7). Feature 202 (F202) was a shallow posthole with a diameter of about 14.5 cm. The feature was first recognized by a piece of the blade of a bison scapula found protruding vertically a few centimeters above the floor of the excavation in Level 3 (Figure 3.8). Upon excavation, the posthole was found to extend no more than about 15 cm below the floor of the excavation. It likely originated at least 10 cm higher up in the profile, but had had its top truncated in the plow zone. The posthole fill contained pieces of a broken bison scapula hoe that had been left in the hole after the post had been removed. It is possible that the hoe parts had been used as a wedge to tighten up the post that the hole had once contained. Such a shallow posthole was probably not a major structural member of an earthlodge. Rather, it was more likely used to support some piece of interior house furniture, such as a perimeter bed or a central hearth rack, assuming the feature was once within a circular-shaped earthlodge.

Feature 203 (F203) was representative of a linear series of closely spaced, stick- or pole-sized holes found at the base of XU9 at 30 cm sd (Figure 3.7). These small-diameter holes appeared as circular areas of light-colored material that stood out quite well against the dark, black background of the intact, lower portion of the surface A horizon, below the plow zone (Figure 3.9). Without this extreme contrast in color, it is doubtful that such small features would have been recognized during excavation. The presence of the light-colored feature fill within a much darker soil matrix suggests that the wooden poles or sticks they probably once contained had been pulled out and removed, with the holes then refilling with lighter colored wind-blown material. We counted 20 of these small holes extending diagonally across the northern two squares of XU9. These features were too small for conventional excavation, so it was decided to measure the depth of one of the holes by probing with a hand-coring tool. Designated Feature 203, this circular-shaped area of light-colored soil with a diameter of about 4 cm, was selected for probing: it was found to extend no more than about 4 cm below the floor of the unit. However, given its occurrence at the base of the plow zone, it is likely that it, like F202, once extended for another 10 cm or so up into the undisturbed, native soil. Other features in the F203 series were oval-to-circular-shaped and varied in size from as little as 3 cm to as much as 7 cm in diameter. Small, circular-shaped holes with diameters of the 3-4 cm were the most common (n=10). Oval-shaped holes exhibited greater variation in size, ranging from as little as 3-x-4 cm to as much as 6-x-10 cm. All are assumed to have depths similar to that of the single probed example (F203).

It is difficult to know what to make of this line of small-diameter holes. At first we thought that they might represent the wall of a lightly built structure, such as a wickiup, constructed of long, slender wooden poles with their ends pushed or dug into the ground to form a dome-shaped, exterior framework. On the other hand, the line of small holes could come from some kind of screen or divider built of sticks within an earthlodge. We find the latter possibility the most likely given that circular-shaped earthlodges have been confirmed by excavation in the A terrace area of the Elbee Village site (Ahler ed. 1984). Expansion of XU6 would be necessary to uncover more such features in order to determine their true nature and function, as well as the true function of the larger F202 posthole, located no more than 60 cm away from the line of small holes (Figures 3.7 and 3.9).

Our findings in XU9 were unclear in regard to the geophysical anomaly. We were expecting to find a pit or hearth at this location, given the magnetic characteristics of the anomaly, but instead we found what could be the remains of interior earthlodge features. It is unlikely that small posthole features would produce the magnetic signature of the anomaly. Rather, it is possible that the anomaly marks a portion of an earthlodge floor, or that the anomaly was actually deeper than the ending depth of the unit. In any event, XU9 does not seem to shed any particular light on the exact nature of the anomaly. Wider and perhaps deeper excavation of XU9 could possibly clarify the issue of the anomaly at this location.

B Terrace Units (XU6, F102, XU7, XU8)

The squares comprising XU6, XU7, and XU8, dug into the B terrace remnant at the far northern end of the site, followed a different screening and recovery protocol. Initially, a 10-cm level of each southwestern square in the 2-x-2-m units was dug and screened for artifacts. If artifacts were found in this “control square,” then the levels of the other three squares were dug and screened as well. However, if no artifacts were found (or essentially no artifacts), then the levels of the other three squares were dug

a

b

Figure 3.8. Photographs of the Elbee site excavations. a: F202 in XU9 before excavation, south view (KNRI-10-231). b: F202 in XU9 after excavation, south view (KNRI-10-239).

a

b

Figure 3.9. Photographs of the Elbee site excavations. a: F203 postholes in XU9 (with F202), east view (KNRI-10-226). b: F203 postholes in XU9 (with F202), north view (KNRI-10-230).

without screened recovery. This reduction in screened recovery for the three excavation units located in the B terrace area was necessary to speed along the work where the excavations were expected to go much deeper to reach the Plains Village-age deposit than the 30 cm needed in the A terrace area.

The excavated matrix of all screened levels in XU6, XU7, and XU8 was dry screened through one-quarter-inch-mesh hardware cloth screens, except for the terminal level of XU6. Level 9 in each XU6 square, the level associated with the F201 hearth exposure, was subjected to a more rigorous screening procedure consisting of a combination of dry screening and water screening. Eight-ninths (89%) of the Level 9 excavated matrix from XU6 squares was dry screened through one-quarter-inch-mesh screen, as before, but the remaining one-ninth sample (11%) was water screened through one-sixteenth-inch-mesh screen to enhance recovery of very small artifacts. The one-ninth sample was taken consistently as a 33.3-x-33.3-cm sample block from the southwest corner of the square. As before, all materials remaining in the screens were retained for laboratory processing and analysis. All excavated levels were skim-shoveled by hand to enhance in-situ artifact recovery and feature recognition. Occasional artifacts found during skim shoveling of unscreened levels were bagged and retained for laboratory processing and analysis.

Excavation Unit 6. XU6 was placed in the far northern part of the site, near XU7 and XU8, at the location of a basin-shaped hearth (F201) exposed in the Knife River cutbank at a depth of about one meter (Figure 3.1). XU6 was a 2-x-2-m unit that consisted of squares 677NE517, 677NE518, 678NE517, and 678NE518 (Figure 3.10). All four squares of XU6 were dug to uniform depths of 90 cm sd, as measured by line level from the southwest corner of the unit. However, because the ground surface sloped upward noticeably from west to east in XU6, toward the river, the two eastern squares obtained deeper relative surface depths than did the two western squares (i.e., the two eastern squares were actually about 10 cm deeper relative to the two western squares). XU6 was intended to reach down to the level of the hearth, working as close to the riverbank above the exposed hearth as was practicable, to salvage what we could of this feature and its immediate area (Figure 3.11). Working this close to the high Knife River cutbank was challenging and had to be done with great care so as not to lose this part of the bank and the feature it contained (not to mention losing any students or staff in the process).

The base of what appears to be an unfired clay pot was found in Level 9 of XU6, the level associated with the F201 hearth exposure (Figures 3.10, 3.11b, 3.12). The pot base could not be recovered intact because of its very fragile (unfired) and highly fragmented condition (cf. Figure 3.12). No part of the hearth basin itself extended into XU6, except for a small, slightly depressed, ashy lens in the east wall of the unit, which is thought to be the very western margin of the hearth (see profile section, below). The east wall of XU6, comprising a soil balk above the F201 cutbank exposure, was not excavated as originally planned. First, excavation of the balk above F201 could not be done until the cutbank face had been profiled in detail, which was not accomplished until much later because of wet weather conditions in May. Second, excavation of the balk above F201 would have weakened and further destabilized the bank around the feature, possibly resulting in its total loss. And third, excavation of the balk would have left nothing against which to backfill XU6, leaving the area open to increased erosion.

Screening of Levels 1-4 in the control square of XU6 (677NE517), down to 40 cm sd, indicated these upper levels were devoid of artifacts. Therefore, Levels 1-4 of the other three squares were dug by skim shoveling but not screened. A thin scattering of prehistoric artifacts, including bone fragments, a large stone tool (fire-cracked rock tool), a flake, and charcoal staining, was uncovered in Levels 5/6 in XU6. As a result, it was decided to fully screen all of the XU6 squares from Level 5 down to Level 9, its terminal level. Evidence of two prehistoric artifact deposits was found in XU6 at depths of around 50-60 cm sd (Levels 5/6) and 85 cm sd (Level 9). The Level 5/6 artifacts are indicative of an ephemeral Late Plains Village component that post-dates the primary Middle Plains Village component at Elbee. It is noteworthy that this is thought to be the same Late Plains Village component represented at the Karishta site, a short distance to the north. The Level 9 artifacts, including the pot base, were associated with the F201 hearth remnant exposed in the adjacent Knife River cutbank. Broader association of the Level 9 artifacts and the F201 hearth with the primary Middle Plains Village component at Elbee is indicated by pottery attributes and radiocarbon dates.

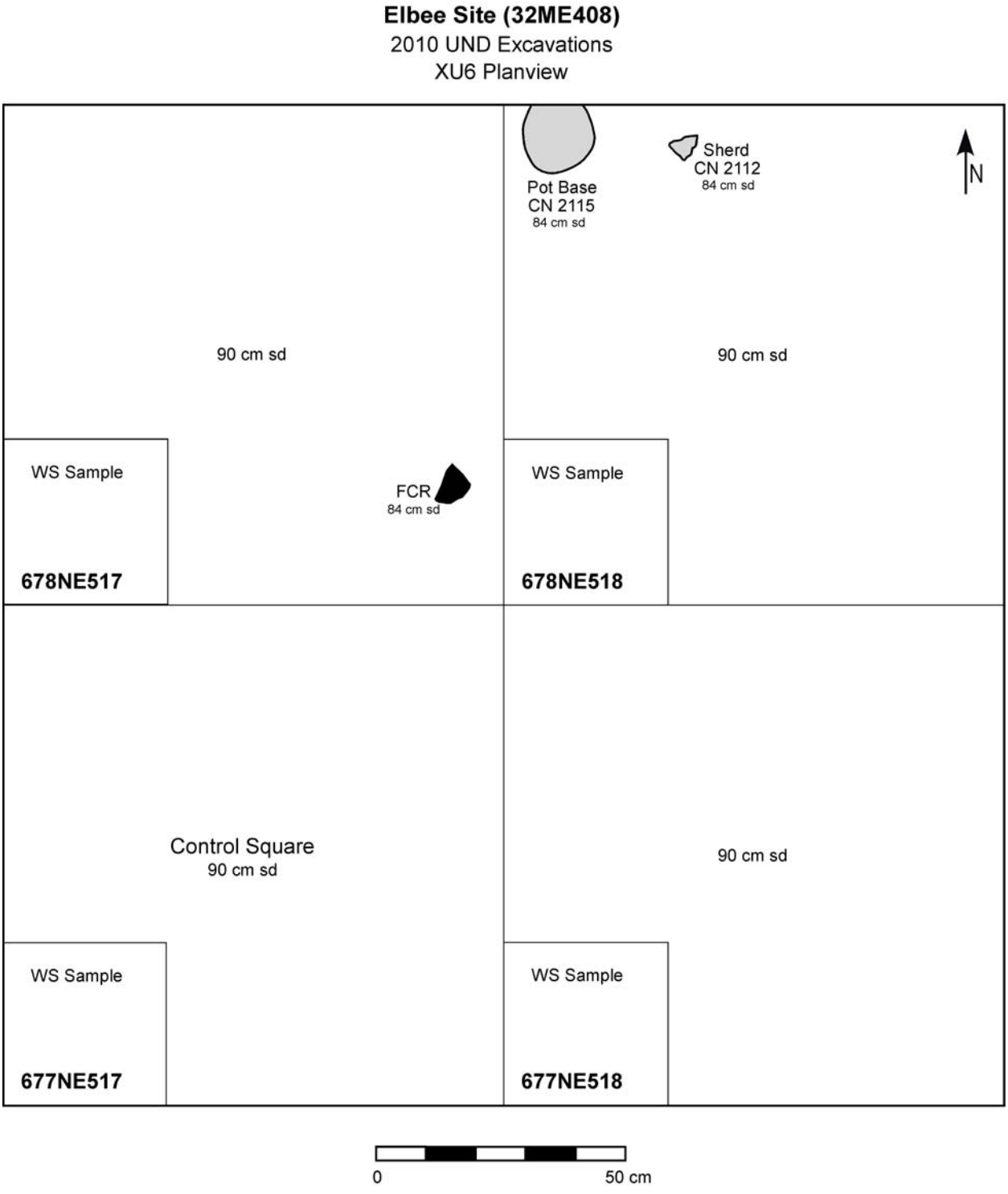

Figure 3.10. Plan map of XU6, Elbee site.

a

b

Figure 3.11. Photographs of the Elbee site excavations. a: XU6 under excavation at F201 location, northeast view (KNRI-10-090). b: XU6 completed with pot base, northeast view (KNRI-10-172).

a

b

Figure 3.12. Photographs of the Elbee site excavations. a: XU6 pot base, close, south view (KNRI-10-221). b: XU6 pot base, closer, south view (KNRI-10-223).

Feature 201. Feature 201 (F201) was a remnant of a basin-shaped hearth exposed in the Knife River cutbank at a depth of about 100 cm sd (Figure 3.13). As discussed previously, it was the discovery of F201 by NPS personnel that had piqued interest in this part of the site. XU6 was offset above and just to the west of the hearth remnant, near the edge of the cutbank, in order to excavate down to the level of the feature to sample its archeological content and that of the occupation level around it. Before starting excavation on XU6, the cutbank was stabilized by trimming away loose and overhanging sediments. Charcoal visible in the hearth profile was collected from the cutbank before it was trimmed. Trimming of the cutbank dislodged some of the hearth remnant, which was not entirely stable. The slumped hearth matrix was collected and retained for later processing by fine water screening in the lab.

It was our intention to profile the cutbank exposure around F201 during the field school work at the site, but this could not be accomplished because of inclement weather. Frequent rains made the cutbank slippery and unworkable, so profiling had to be postponed on a number of occasions. Furthermore, contrary to what one might expect, the silty soils of river terrace exposures in the region are difficult to read when wet, making dry field conditions preferable for accurate recording. When XU6 was completed and profiled, another attempt to profile the cutbank was spoiled by thunderstorms. By then, the time allotted for the field school to work at Elbee had come to an end and plans were made to return to the site later in the summer to profile the upper cutbank at the F201 exposure. In the interim, the hearth and much of its profile was taken out for purposes of another project (Roos 2010). This project, conducted under a separate arrangement with the NPS, was to collect feature and profile sediments for a proposed thermal analysis of the fire hearth relative to the hypothesis, originally suggested by Toom, that the feature might have been used to fire pottery. Removal of the hearth remnant made later profiling of the exposure problematic. However, we were able to determine the former position of the hearth in the cutbank and obtain an accurate profile of the exposure, sans hearth, relating it to the obverse profile made earlier of adjacent XU6, which by then had been backfilled.

The F201 hearth exposure is discussed in greater detail below in the section on profiling. For now, it is sufficient to simply document the presence of the feature and detail the fieldwork it involved.

Excavation Unit 7. XU7 was placed in the far northern part of the site over a geophysical anomaly (Figure 3.1). XU7 was a 2-x-2-m unit that consisted of squares 702NE517, 702NE518, 703NE517, and 703NE518 (Figure 3.14). All four squares of XU7 were dug to uniform depths of 60 cm sd, as measured by line level from the southwest corner of the unit. However, because the ground surface sloped upward noticeably from west to east in XU7, toward the river, the two eastern squares were actually about 5 cm deeper in terms of relative surface depth. Levels 1-4 of XU7, down to 40 cm sd, were found to be essentially devoid of artifacts by screening of these levels in the XU7 control square (702NE517). Consequently, Levels 1-4 of the other three squares were skim-shoveled but not screened (Figure 3.15a). A thin scattering of artifacts was found at the bottom of Level 4 in XU7 and extending into Level 5, at depths ranging from about 40-50 cm sd. Screening of all excavated levels was started with Level 5 in XU7, extending down to Level 6, its terminal level. As in XU6, the Level 4/5 artifacts in XU7 are indicative of an ephemeral Late Plains Village component that post-dates the primary Middle Plains Village component at Elbee. This same component is likely present at the nearby Karishta site.

Full screening of Levels 5-6 in XU7 did not yield many additional artifacts, and extensive probing (hand coring) of the floor of the excavation unit down to 150 cm sd produced no evidence whatsoever of an archeological feature or artifact scatter deposit at greater depth. Given these findings (or lack of findings), it was decided to terminate excavation in XU6 at 60 cm sd (Figure 3.15b). One larger piece of fire-cracked rock (FCR) was recovered from XU7 at a depth of about 50 cm sd, but we do not believe that it alone would have produced the magnetic signature of the geophysical anomaly. No other materials that might have produced a magnetic anomaly at this location were encountered in the excavation.

Excavation Unit 8. XU8 was placed in the far northern part of the site a short distance to the east of a geophysical anomaly (Figure 3.1). XU8 was a 2-x-2-m unit that consisted of squares 688NE512, 688NE513, 689NE512, and 689NE513 (Figure 3.16). Squares 688NE512 and 688NE513 were both dug to uniforms depths of 70 cm sd, as measured by line level from the southwest corner of the unit; excavation of squares 689NE512 and 689NE513 was terminated at depths of 50 cm sd each.

a

b

Figure 3.13. Photographs of the Elbee site excavations. a: F201 hearth in cutbank, west view (KNRI-10-053). b: F201 hearth in cutbank, close, west view (KNRI-10-052).

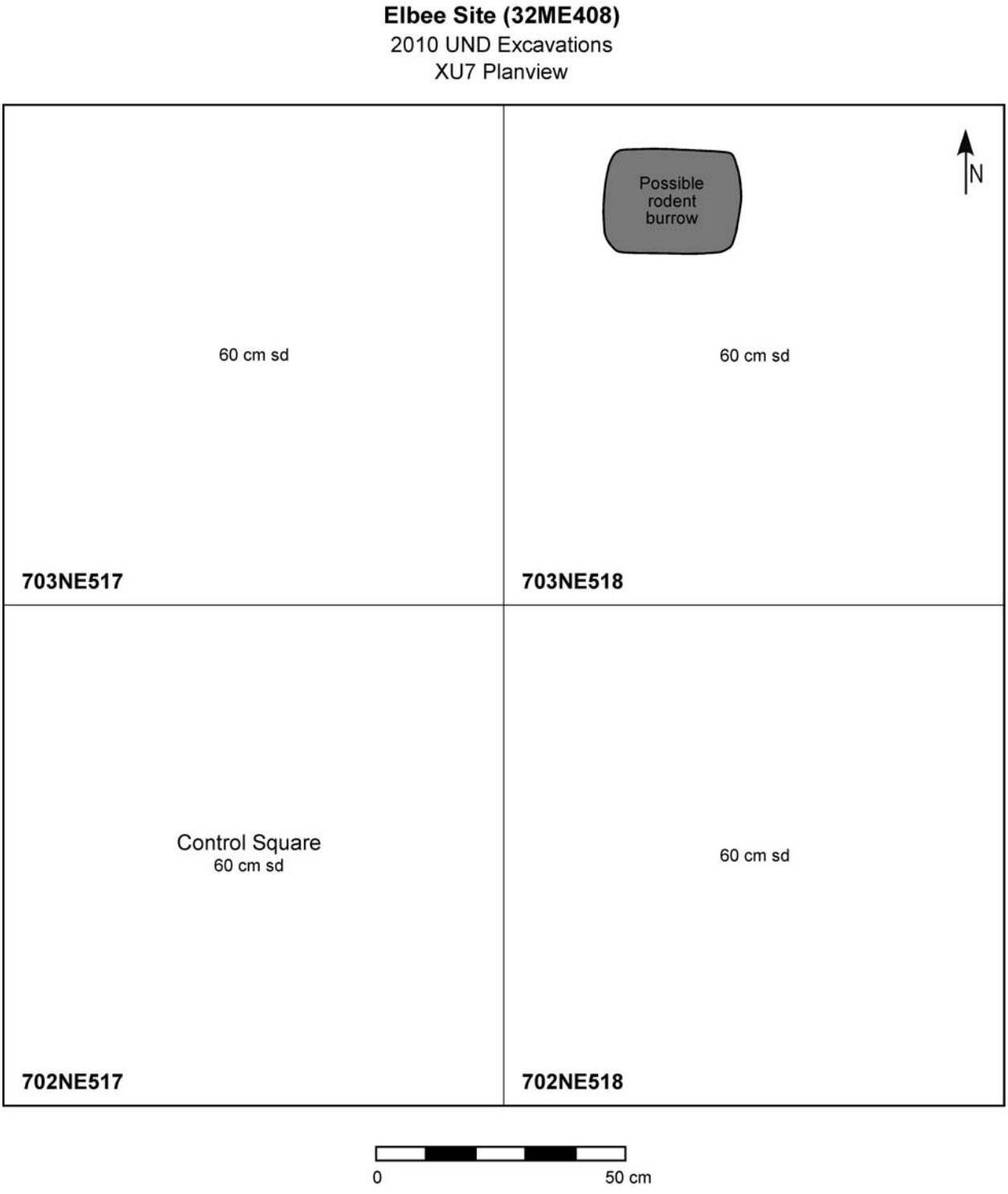

Figure 3.14. Plan map of XU7, Elbee site.

a

b

Figure 3.15. Photographs of the Elbee site excavations. a: XU7 under excavation, northeast view (KNRI-10-076). b: XU7 completed, northeast view (KNRI-10-127).

Figure 3.16. Plan map of XU8, Elbee site.

In XU8, only the matrix from the control square (688NE512) was screened through one-quarter-inch-mesh hardware cloth in Levels 1-5; the other squares were skim-shoveled but not screened (Figure 3.17a). A few scattered artifacts were recovered from the upper levels of XU8 in this manner, but no consistent occupation levels were discernible. Level 4 produced a flake and a bone fragment; it is thought that this material probably relates to the ephemeral Late Plains Village component identified in XU6 and XU7, as well as at the Karishta site to the north. At 50 cm sd, it was decided to step the unit down to two squares (688NE512 and 688NE513) and continue the excavation as a 1-x-2-m unit, screening each level down to 70 cm sd where excavation of the 1-x-2-m unit was terminated (Figure 3.17b). Probing had indicated the presence of two closely spaced, clayey C horizons from around 70-100 cm sd in the XU8 profile. Stratigraphically, these clayey horizons lie just below the silty horizon associated with the F201 hearth exposure. The top of the first clayey C horizon was encountered in XU8 near the base of Level 7, indicating that the XU8 excavation could be terminated because it had been dug through the hearth horizon without result. As with XU6 and XU7, the ground surface of XU8 also sloped noticeably upward from west to east in XU7, making the depths of the two eastern squares as much as 10 cm deeper in terms of relative surface depth.

No sign of a geophysical anomaly was found in XU8, as completed. XU8 was offset to the east of the anomaly location, at the request of the NPS, in order to keep the B terrace excavations at Elbee in close proximity to the cutbank. Still, it was hoped that we might be able find the edge of the anomaly, which was rather broad, or at least an associated artifact deposit. Our expectations were not realized, however, and no information was forthcoming for the anomaly from the excavation.

Karishta Test Excavations

Three 1-x-2-m excavation units (XUs) were dug at the Karishta site in 2010, as mentioned above (Figure 3.1). These units were placed in topographically different parts of the site area, as originally recorded, to test its horizontal limits and diversity (Figure 3.18). The units were dug just deep enough to expose a near-surface archeological deposit believed to be of Late Plains Village age. No geophysical survey work has been done at Karishta. The test excavations conducted there in 2010 were done purely to test for the presence of archeological deposits and to verify the site location of record. The Knife River channel currently cuts up against the eastern margin of the Karishta site, which is also being actively eroded. As mentioned before, excavation units at Karishta were dug off grid with their locations later mapped and tied into the Elbee grid by use of a total station.

Excavation Unit 1-2

The two squares making up Excavation Unit 1-2 (XU1-2) were placed together on a small, low elevation point of land at the eastern site limit, actually part of the Knife River floodplain, south of the drainageway channel that is cutting into the site from the northeast. The long axis of the 1-x-2-m unit was oriented on true north (Figure 3.19).

XU1-2 was dug to a depth of 40 cm sd (Levels 1-4). This took the unit through the surface A horizon and into alluvial subsoil consisting of thin layers, or bands, of clay and silt (Figure 3.20a). Matrix from all four levels of each XU1-2 square was screened through one-quarter-inch-mesh hardware cloth, except for Level 1 of XU2, a heavy sod level, which was not screened. The unit produced no artifacts except one piece of recent historic window glass. The bottom of the unit was probed down to 70 cm sd where a hard-pan layer was encountered. Between the bottom of the unit and the hardpan were more layers of clay and silt.

Excavation Unit 3-4

The two squares of Excavation Unit 3-4 (XU3-4) were situated together as a 1-x-2-m unit on slightly higher ground at the south end of the site, on the south side of the shallow drainageway that bisects the site area. The short axis of the unit was oriented on true north. After the initial excavation of

a

b

Figure 3.17. Photographs of the Elbee site excavations. a: XU8 under excavation, southeast view (KNRI-10-092). b: XU8 completed, east view (KNRI-10-141).

a

b

Figure 3.18. Photographs of the Karishta site excavations. a: Karishta site area with XU1-2 (left) and XU3-4 (right), south view (KNRI-10-084). b: XU1-2 (right) on floodplain, XU3-4 (left) on high ground along drainageway, north northwest view (KNRI-10-087).

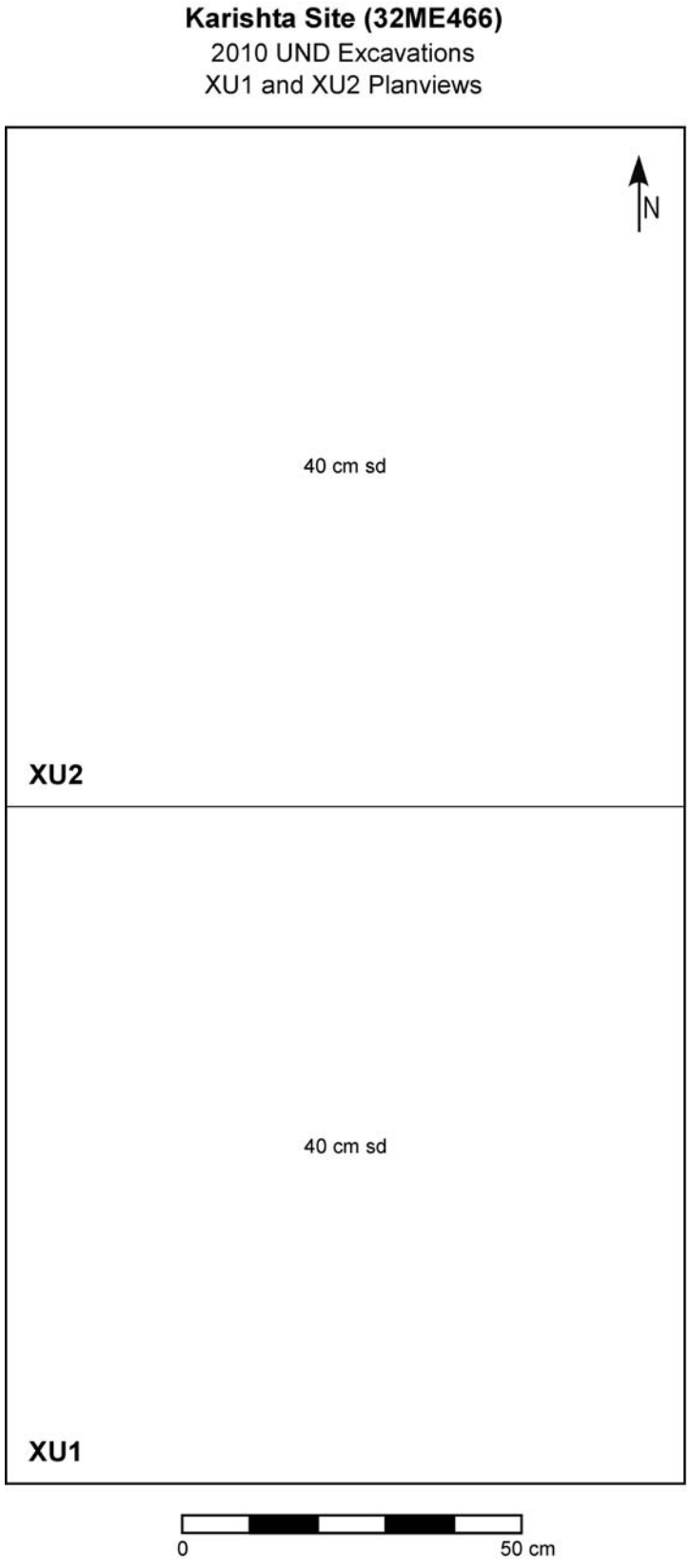

Figure 3.19. Plan map of XU1-2, Karishta site.

a

b

Figure 3.20. Photographs of the Karishta site excavations. a: XU1-2 completed, north northwest view (KNRI-10-119). b: XU3-4 bone and FCR, Level 4, north view (KNRI-10-137).

the XU3 square, the XU4 square was added to the west side of XU3 to further expose archeological materials (bone and FCR) found in extending into the western wall of XU3 (Figure 3.21).

XU3-4 was dug to a depth of 50 cm sd (Levels 1-5). Matrix from all five levels of each XU3-4 square was screened through one-quarter-inch-mesh hardware cloth, without exception. A large piece of bison bone (distal humerus) and a piece of fire-cracked rock were found near the bottom of Level 4, resting at depths of 36-40 cm sd (Figure 3.20b). The unit was taken down another 10 cm level (Level 5) but no other artifacts were noted at greater depth (Figure 3.22a). The artifacts recovered from Level 4 are believed to be Late Plains Village material of the same age and occupational component as the Late Plains Village material found in the far northern part of the Elbee site in much the same geomorphological setting; a narrow area of B terrace remnant.

Excavation Unit 5-6

The 1-x-2-m unit designated Excavation Unit 5-6 (XU5-6) was located on a slightly elevated piece of ground at the north end of the site, on the north side of the shallow drainageway, about where the 1980 site recording datum is marked on the site form sketch map. This is the same landform as that occupied by XU3-4, it just happens to be on the opposite side of the drainageway, on the main body of the B terrace. The long axis of the unit was oriented on true north (Figure 3.23).

XU5-6 was dug to a depth of 40 cm sd (Levels 1-4). Matrix from all four levels of each square was screened through one-quarter-inch-mesh hardware cloth. A few bone fragments and one KRF flake (<G3 size grade) were recovered from Level 3 of the unit. Level 4 produced no artifacts so excavation of the unit was terminated at 40 cm sd (Figure 3.22b). The few artifacts recovered from XU5-6 are thought to relate to the same Late Plains Village component as that identified in XU3-4, as well as that in the far northern part of the Elbee site in the B terrace remnant.

Cutbank Examination and Landforms

The high Knife River cutbank that forms the northern limits of the Elbee site, as well the eastern limit of the Karishta site, was closely examined for feature and artifact exposures (Figure 3.24). Of particular interest in this exercise was the relocation of a bone deposit and associated scattered charcoal found exposed at great depth (about 4 m) in the A terrace cutbank by NPS personnel in 2009. During the 2010 examination of the full cutbank exposure at Elbee and Karishta, by both Toom and LeBeau, no artifact concentrations or other definite indications of archeological deposits or features were observed, other than the already identified F201 hearth exposure. It is thought the deeply buried bone and charcoal deposit observed in 2009 had been lost to ongoing erosion or possibly reburied by additional slumping of the A terrace cutbank.

It is noteworthy that two different landforms are visible in the Knife River cutbank exposure at the north end of the Elbee site. The first is the high A terrace cutbank seen on the left in Figure 3.24a; the second is the lower elevation B terrace cutbank on the right. Notice how the younger stratigraphic units in the B terrace ride up on the older A terrace landform and merge with its near-surface stratigraphic units of approximately the same age (Figure 3.24b). This indicates that preceramic-age archeological deposits are unlikely to be found intact in the B terrace area. On the other hand, preceramic-age deposits could be preserved in the A terrace landform.

Soil Associations and Profile Descriptions

The surface of the A terrace at the Elbee site is mapped as a Straw Loam soil, 3 to 6 percent slopes (map unit 91B) (Wilhelm 1978:Map 42). The Straw Loam is a deep, well drained, gently sloping or undulating soil formed in loamy alluvial parent material on low terraces and bottomland adjacent to major streams such as the Knife River. The typical surface layer of this soil is about 20 inches thick and consists of grayish brown loam over very dark grayish brown silt loam. The depth and texture of the substratum are variable, but generally tend to be dark-colored loams to a depth of 60 inches; a subsoil

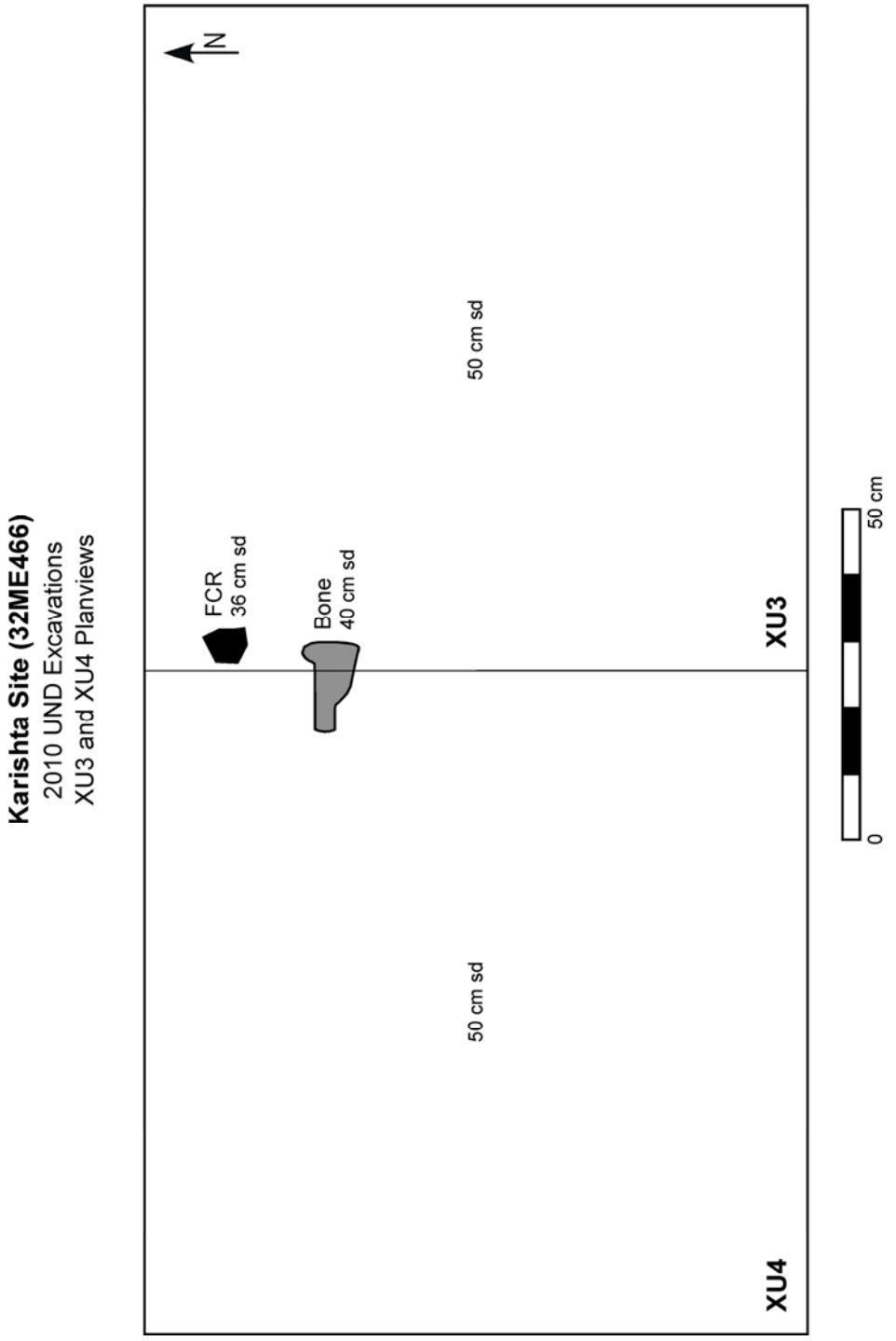

Figure 3.21. Plan map of XU3-4, Karishta site.

a

b

Figure 3.22. Photographs of the Karishta site excavations. a: XU3-4 completed, northwest view (KNRI-10-207). b: XU5-6 completed, east view (KNRI-10-245).

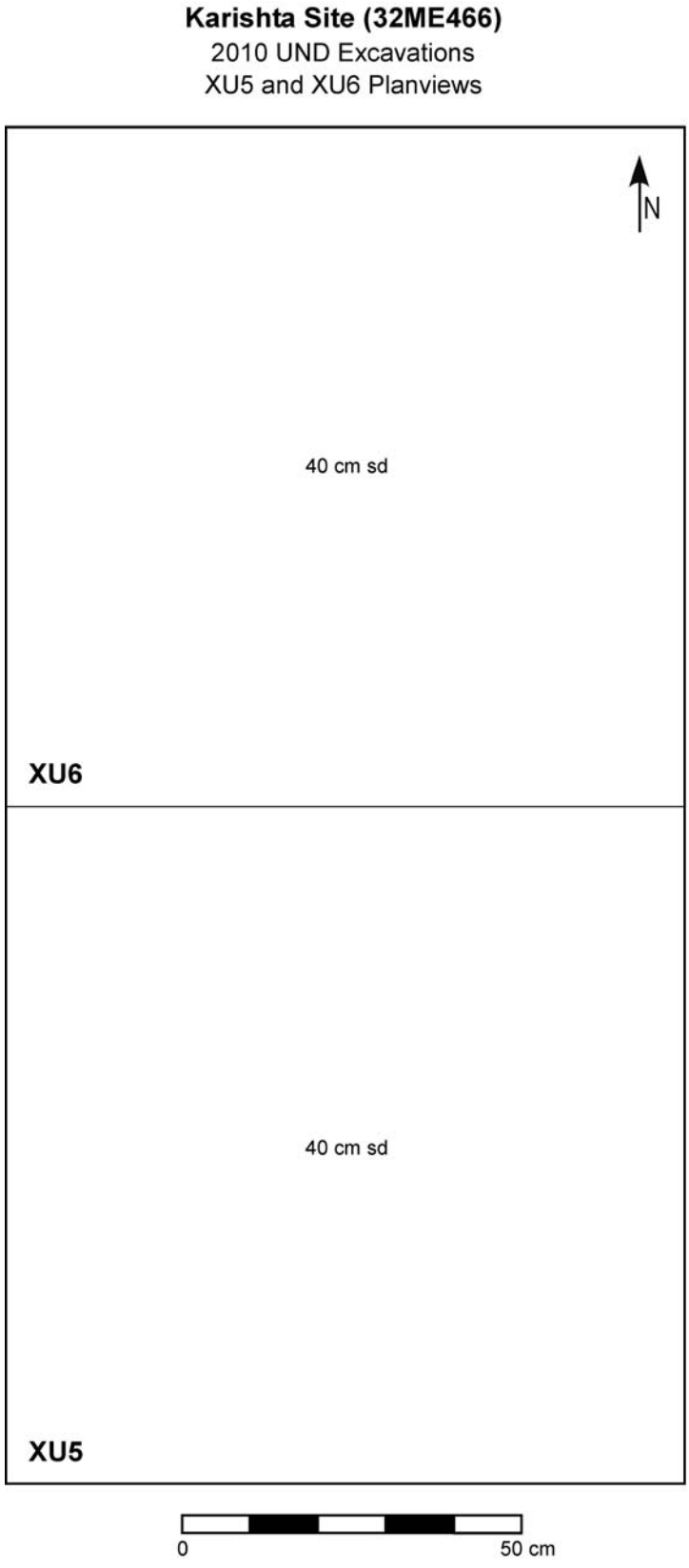

Figure 3.23. Plan map of XU5-6, Karishta site.

a

b

Figure 3.24. Photographs of the Knife River cutbank. a: Overview of A terrace and B terrace cutbanks, south southwest view (KNRI-10-180). b: B terrace cutbank and transition to A terrace (left), southwest view (KNRI-10-182).

layer is sometimes present. Dark "buried layers" can be present in both the surface layer and the substratum (Wilhelm 1978:59).

The B terrace area, including the far northern part of Elbee and all of Karishta, is mapped as a Straw Silty Clay Loam (map unit 7). Straw Silty Clay Loam is a deep, well drained, level soil formed on low terraces and bottomland along major streams such as the Knife River. It is also found on fans in glacial outwash trenches. Areas of these soils are occasionally or rarely flooded for brief periods of time. The typical surface layer is a grayish brown to dark grayish brown silty clay loam down to about 13 inches. The substratum, to a depth of about 60 inches, consists of grayish brown loam over light brownish gray, stratified silt loam and fine sandy loam. A darkened, buried layer is found in most places in the substratum (Wilhelm 1978:14).

As a series, Straw soils are classified as mollisols. In the typical profile, the depth to carbonates ranges from 7-20 inches, the thickness of the solum (A and B horizons) is between 20-35 inches, and the mollic epipedon is from 16-30 inches thick (Wilhelm 1978:101).

The excavation profiles recorded at the Elbee and Karishta sites in 2010 generally agree with the Straw Loam and Silty Clay Loam associations, with one exception. Rather than being a loam, the soil capping the A terrace, as well as the higher elevation parts of the B terrace, "feels" more like a silt loam. Only in the profile of XU1-2 at Karishta, dug into a small piece of the Knife River floodplain, was a surface horizon of silty clay loam identified. It is thought that the silt loam layer covering nearly the entire areas of these sites represents a cap of aeolian sediment that blankets these landforms near the Knife River. Such aeolian silt caps are commonly found on alluvial terraces bordering on the Missouri River and its tributaries (see Clayton et al. 1976; Coogan 1987; Toom 1992a). Finding it here at the Elbee and Karishta sites, then, comes as no surprise.

The excavation profile descriptions that follow generally conform to soil horizon nomenclature presented in Birkeland (1999). Soil colors are from standard Munsell soil color charts. Soil textures were determined by "feel" in the field and are best approximations. No physical or chemical laboratory analyses of soil samples were performed in support of the interpretations made here. Only the upper one meter or so of the site stratigraphy is described in the present report, which represents the maximum depth of excavation. A detailed description of the full stratigraphic profile exposed in the high Knife River cutbank at the Elbee and Karishta sites would have been desirable, but was beyond the scope of these investigations.

Elbee Profiles, A Terrace Units

Excavation units XU5 and XU9 were dug into the surface of the A terrace at Elbee. Their profiles are considered in some detail in the paragraphs that follow.

XU5 Profile. The upper 20 cm or so of the XU5 profile was identified as an Ap horizon, with the "p" subordinate departure indicating plowing or some other form of surface disturbance. Beneath this was the intact, lower portion of the surface A horizon, which exhibited indications of transition to a B horizon (areas of lighter color), hence by the mixed AB designation on the profile (Figures 3.25 and 3.26a). Soil textures in the Ap and AB horizons were estimated as silt loam (SiL). Disturbances by small, burrowing animals were ubiquitous throughout the unit.

All three levels of XU5 produced quantities of Plains Village artifacts, but Levels 1 and 2, corresponding to the Ap horizon, produced the most.

XU9 Profile. The upper 20 cm or so of the XU9 profile was also identified as an Ap horizon (plow zone). Beneath the Ap was the intact portion of the surface A horizon, but it exhibited a much darker color than did the Ap (Figures 3.26b and 3.27). This suggests organic enrichment of the lower A horizon due to human occupation, or the presence of a separate, near-surface A horizon, possibly indicating a welded soil situation. The texture of the Ap horizon was estimated as silt loam (SiL), while the texture of the somewhat heavier A horizon was estimated as silty clay loam (SiCL). Once again, disturbances by

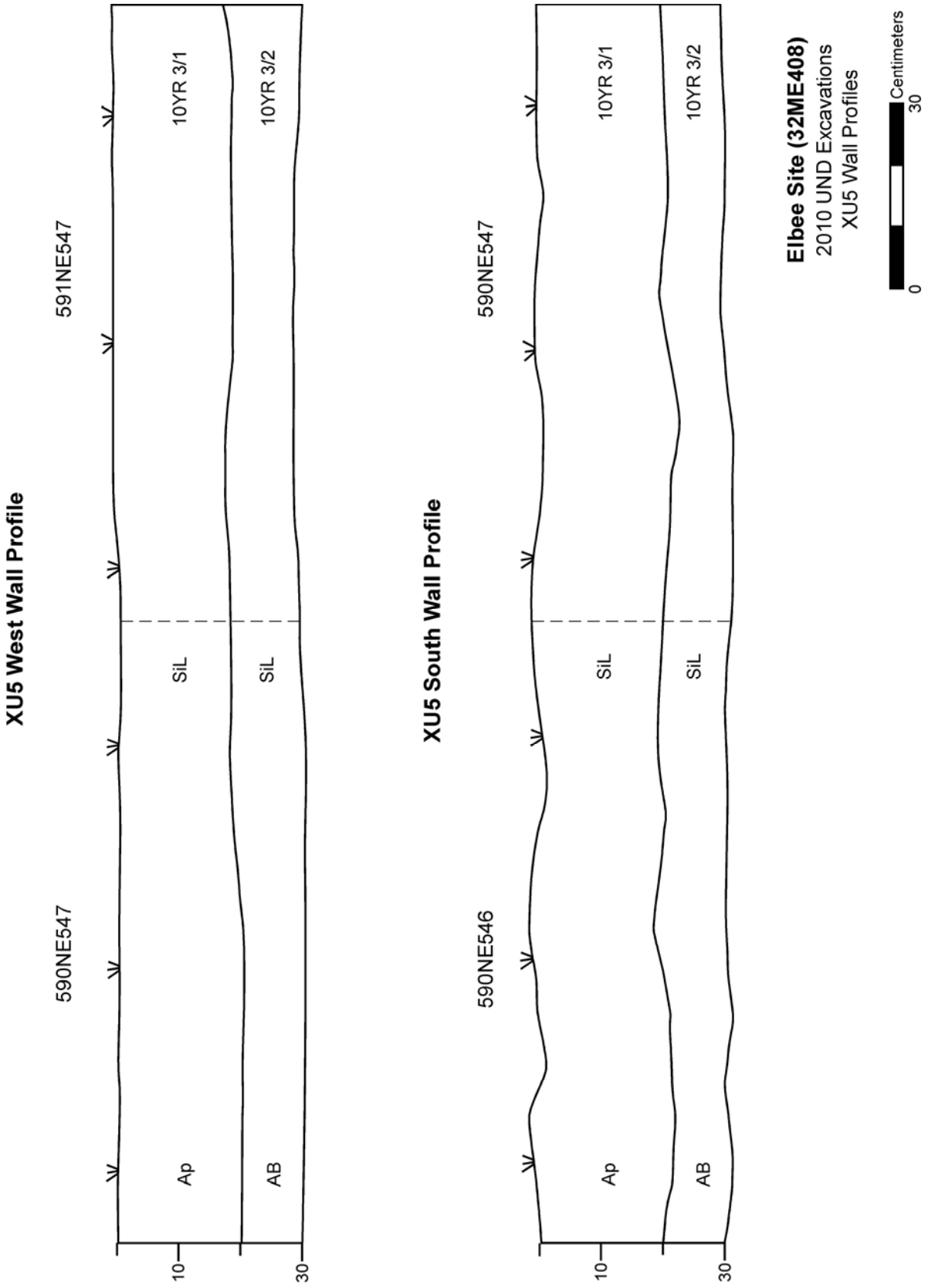

Figure 3.25. Profile drawings of XU5, south and west walls, Elbee site.

a

b

Figure 3.26. Profile photographs of XU5 and XU9, Elbee site. a: XU5, west wall profile, west view (KNRI-10-134). b: XU9, north wall profile, north view (KNRI-10-260).

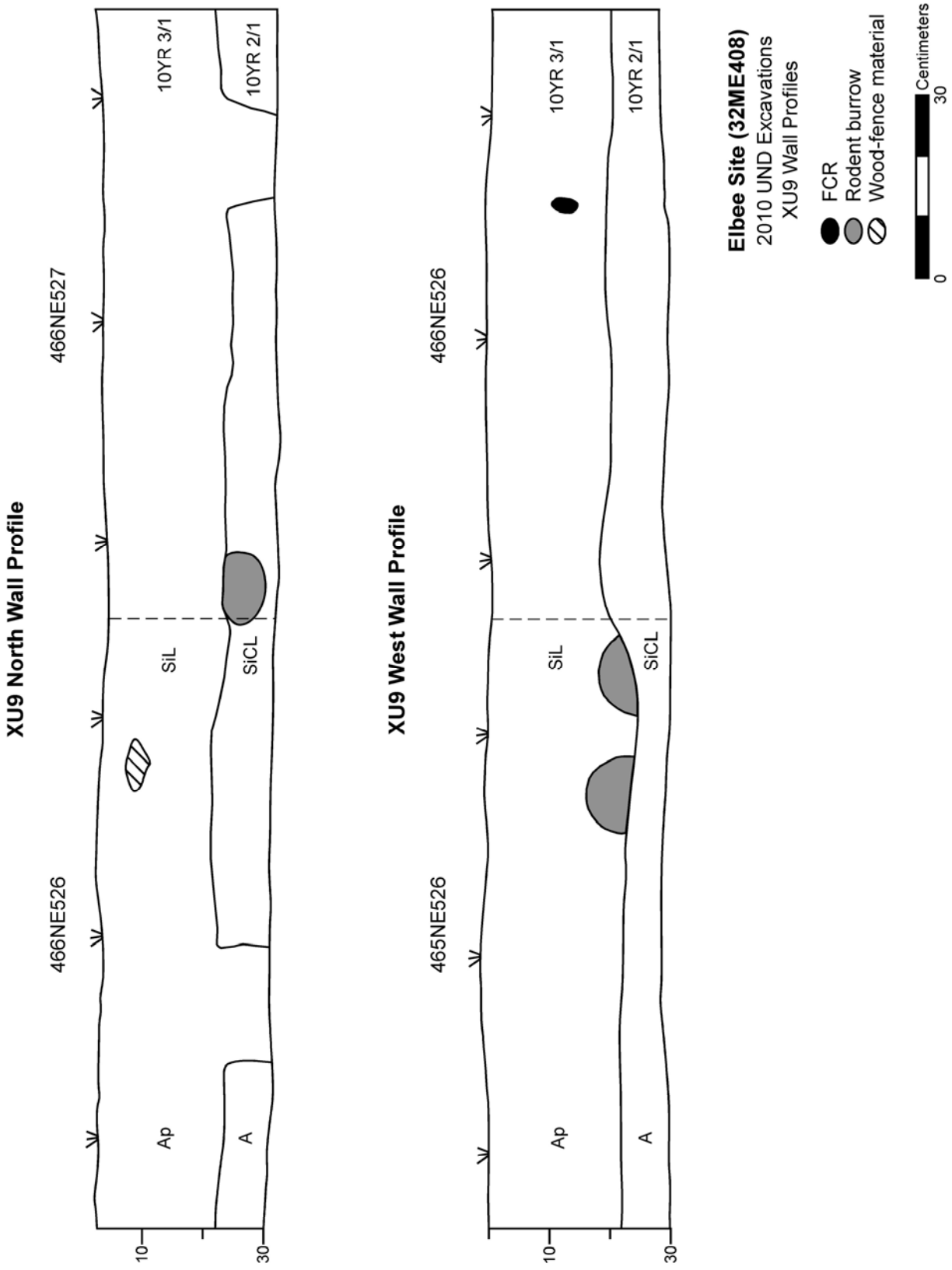

Figure 3.27. Profile drawings of XU9, north and west walls, Elbee site.

small, burrowing animals were ubiquitous throughout the unit. The dark colored soil in the floor of XU9 revealed a number of Plains Village posthole features containing a lighter colored fill, as discussed previously.

All three levels of XU9 also produced numbers of Plains Village artifacts, however, in this case Level 3, corresponding to the upper A horizon, produced the most. Even so, other evidence suggests that the cultural deposit actually originates in the Ap horizon (i.e., features that appeared truncated by plowing).

Elbee Profiles, B Terrace Units

Excavation units XU6, XU7, and XU8 were dug into the surface of the B terrace remnant at Elbee. Their profiles are considered in some detail in the paragraphs that follow. The XU6 profile was used as the master profile. Also considered below is the F201 cutbank profile at the XU6 location.

XU6 Profile. XU6 was dug into the upper back slope of the B terrace remnant in the far northern part of the Elbee site. The unit was nominally dug to 90 cm sd by line level measuring from the southwest corner of the unit. Because the east wall of the unit was about 10 cm high than the west wall, the east wall extends to 100 cm sd in terms of relative surface depth. Therefore, the east wall profile was about 10 cm higher than that the west wall. XU6 served as the control (master) profile for the far north site area excavations (Figures 3.28 and 3.29).

The surface A horizon in the XU6 profile has been completely disturbed by plowing and is therefore identified as an Ap horizon (plow zone). Below the Ap was a lighter colored Bw horizon of variable thickness. Below this typical A over B sequence was a series of rapidly formed, accretional horizons, some of which show decidedly mixed horizon attributes. For example, the A/BC horizon beneath the Bw horizon exhibits alternating dark and light bands characteristic of both A and B horizons, and the still visible laminar bedding of these bands is indicative of a C horizon. Visible carbonates appear in the profile at a depth of just over 30 cm. These are first seen in the ABk1 horizon, which exhibits attributes of both A and B horizons in addition to containing soil carbonates, as indicated by the “k” subordinate departure. Below this is another A/BC horizon with the addition of soil carbonates (A/BkC1). Below it are a Bk1 horizon, an ABk2 horizon, and a Bk2 horizon, with the number indicating the horizon sequence. In reality, the combination A horizons (A/BC and AB) indicated in the XU6 profile are probably best characterized as juvenile A horizons (brief stabilization horizons) that had little time to form in the rapidly aggrading environment of the B terrace.

The most interesting horizon in the profile in terms of archeology is the Cox2 horizon, which consists of an oxidized (“ox”) soil parent material with visible laminar bedding. The F201 hearth exposed in the cutbank at this location is associated with the Cox horizon, as indicated by the “hearth band” drawn as a dotted line in the profile (Figure 3.28). The hearth band consisted of a thin, slightly “ashy,” gray-colored residue of material left around the hearth, derived from wood fires burned in the hearth proper. Where this band dips downward by about 4 cm, it marks the very western margin of the hearth, or at least the western limit of the depressed area occupied by the hearth basin (cf. Figures 3.28 and 3.29b).

In terms of archeological associations, the F201 hearth originated near the center of the Cox2 horizon in the XU6 profile, as just discussed. Late Plains Village component materials in this part of the site (B terrace) were associated with the A/BkC1 horizon.

F201 Cutbank Profile. The profile of the upper cutbank of the Knife River at the F201 location is essentially a mirror image of the east wall of the XU6 profile. Of particular note in the cutbank profile is the void left by removal of the exposed hearth, as well as the ashy, gray band in association with the hearth void, which was also present in the east wall profile of XU6. Both of these features—the hearth and the ashy, gray band—were associated with the Cox2 horizon (Figure 3.30). Horizons overlying the Cox2, including the ABk2 and Bk2 horizons, show depressed horizon boundaries above the hearth void, indicating that a rather deep and broad hearth basin was once present at this location. In the cutbank profile, fine charcoal particles were also noted in the ashy, gray band extending to the north of the hearth

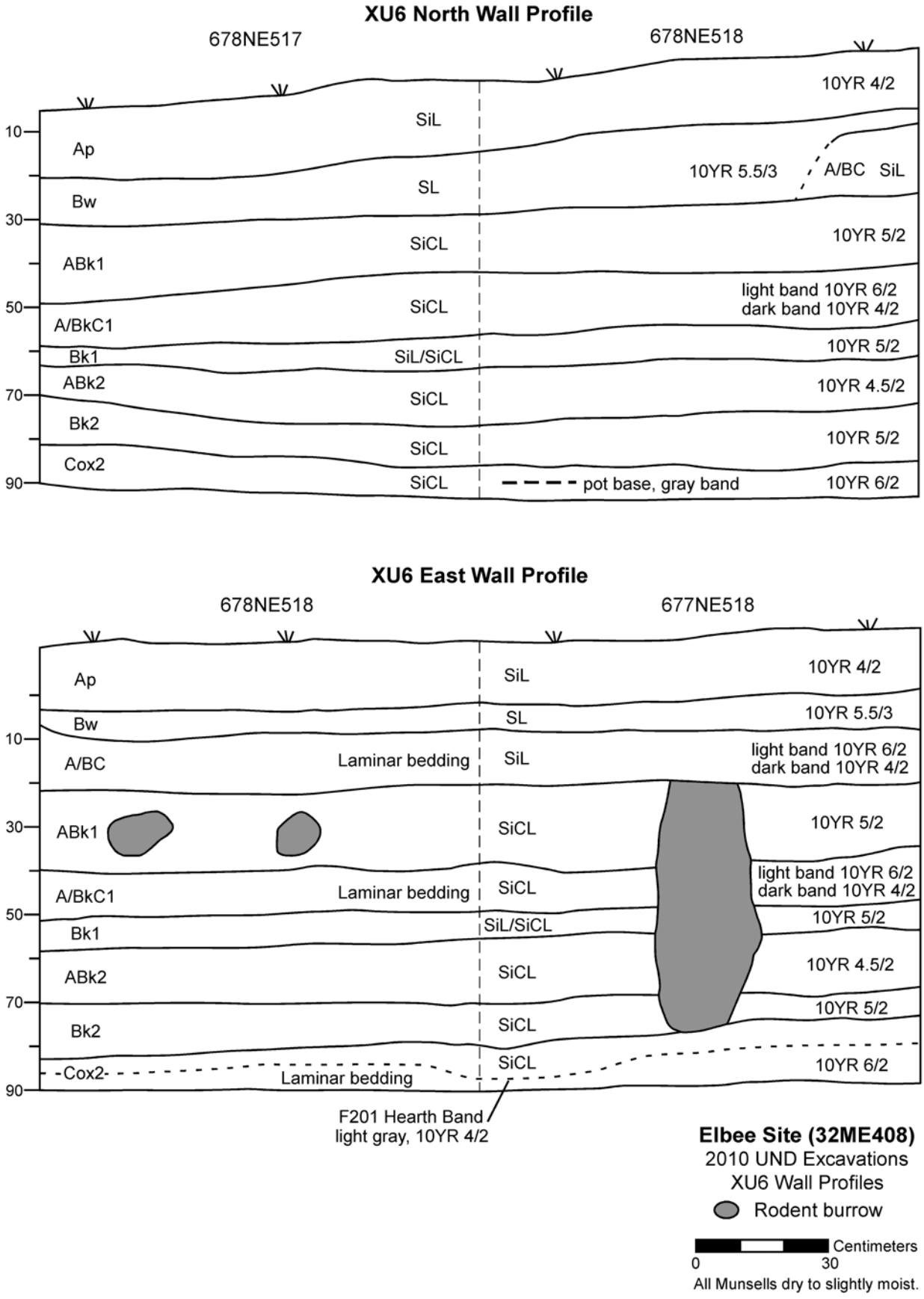

Figure 3.28. Profile drawings of XU6, north and east walls, Elbee site.

a

b

Figure 3.29. Profile photographs of XU6, Elbee site. a: XU6, north wall profile, north view (KNRI-10-211). b: XU6, east wall profile, east view (KNRI-10-174).

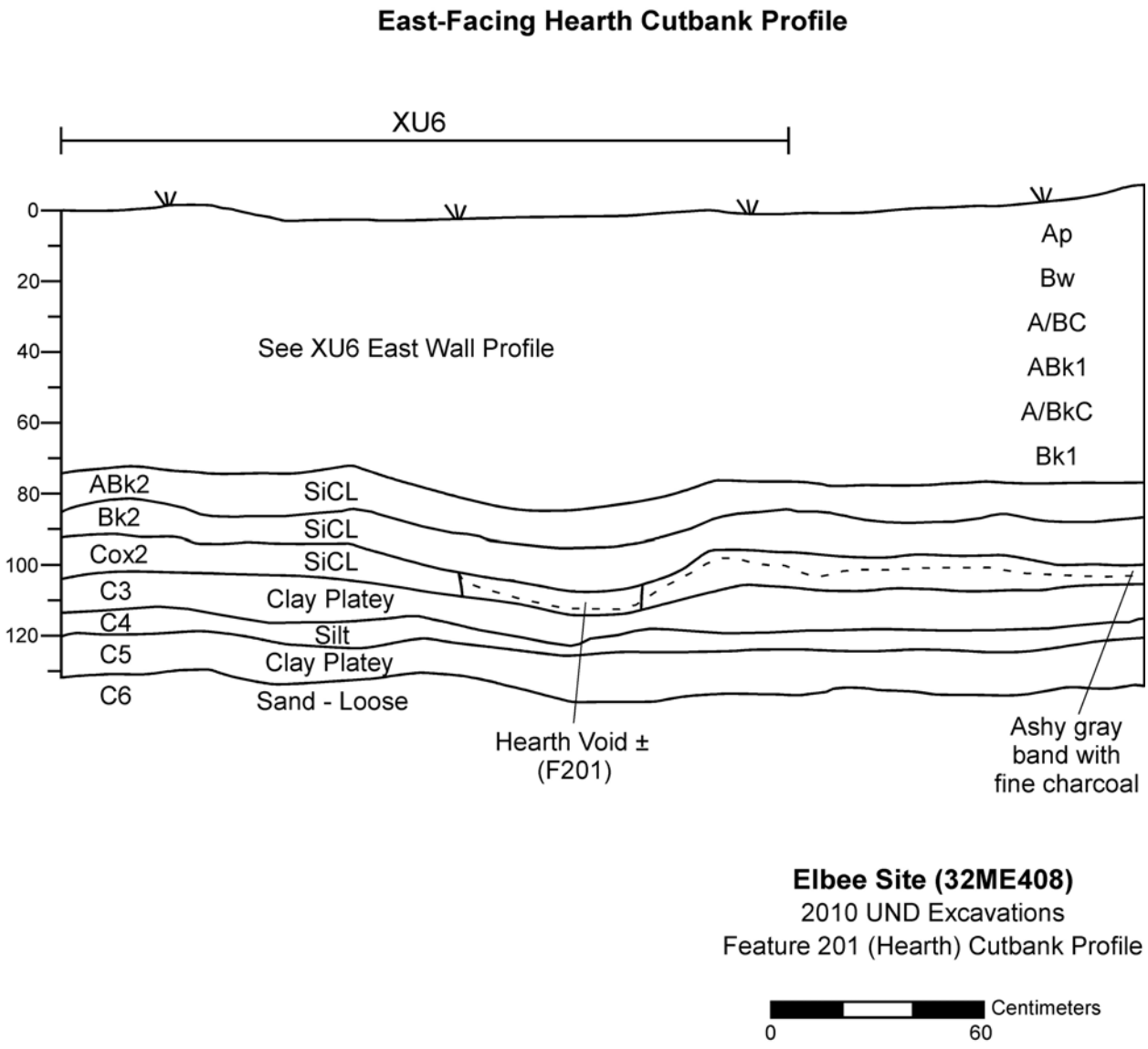

Figure 3.30. Profile drawing of F201 cutbank, Elbee site.

void. The profile was less clear on the south side the hearth void and the ashy, gray band was not discernible in this direction.

Profile photos taken before the complete removal of the hearth indicate that the hearth basin originated within the Cox2 horizon and was dug into and through the underlying C3 and C4 horizons, terminating in the C5 horizon (Figure 3.31). Analysis of these photos indicates that the hearth basin was dug as much as 30 cm below the level of the Cox2 horizon, which contained its surface of origin, marked by the ashy, gray band. The profile photos also suggest that the hearth basin proper was itself contained within a broader depression. These unusual circumstances—an isolated, basin-shaped hearth apparently constructed within a broader, shallow depression—further suggest that F201 was some kind of special-purpose hearth. In this regard, it has been speculated that F201 may have been used for open (bonfire) firing of pottery vessels (see Rice 1987:153-158; Rye 1981:96-98).

XU7 Profile. XU7 was also dug into the upper back slope of the B terrace remnant in the far northern part of the Elbee site. Its profile shows much the same stratigraphic sequence as XU6 down to a depth of 60 cm sd (Figures 3.32 and 3.33). About the only difference is that the A/BkC1 horizon was less distinctive and appeared to pinch out in the profile of the north wall of the unit. In terms of archeological associations, the scant Late Plains Village component materials recovered from the unit were largely associated with the A/BkC1 horizon, like in XU6. This particular horizon also exhibited weak charcoal staining and had been heavily disturbed by burrowing animals.

XU8 Profile. The stratigraphy exhibited in the profile of XU8 was somewhat compressed and much less varied relative to XU6 (Figures 3.34 and 3.35). This is likely because XU8 was dug into the lower back slope of the B terrace, whereas XU6 (and XU7) were dug into the upper back slope of the terrace where soil horizon development was broader and more varied. Of particular note in the XU8 profiles was the absence of an ABk2 horizon. In its place, there was a single Bk horizon where Bk1 and Bk2 horizons would have been present. Of particular note was the presence of the Cox2 horizon near the bottom of the unit at a considerably shallower depth than in XU6 (about 60-70 cm). Beneath the Cox2, in the bottom of the unit, was the C3 horizon of clay with a plately structure, like in the F201 cutbank profile. No definite artifacts were recovered from the Cox2 horizon in XU8. Only a very few artifacts attributable to the Late Plains Village component were found in association with the A/BkC1 horizon.

Karishta Profiles

The three 1-x-2-m excavation units at Karishta were all dug in the surface of the B terrace, which includes the Knife River floodplain. Their profiles are considered in some detail in the paragraphs that follow.

XU1-2 Profile. XU1-2 was dug into a small remnant of the modern Knife River floodplain at the eastern limit of the Karishta site, as originally defined. Its profile exhibited a weakly developed surface A horizon over AC and A/C horizons (Figures 3.36 and 3.37). These horizons are comprised of recent floodplain sediments that did not produce any aboriginal artifacts. From this we can conclude that the Karishta site does not extend down onto the modern floodplain.

XU3-4 Profile. XU3-4 was dug into a remnant of the B terrace, above the Knife River floodplain, in the southern part of the Karishta site. This unit produced stratigraphy similar to that recorded in the XU6 profile at Elbee down to a depth of about 50 cm, except that the artifact bearing A/BC horizon is shallower at Karishta (Figures 3.38 and 3.39). Examination of the Knife River cutbank opposite the Karishta site suggests that the upper stratigraphy at Karishta is compressed compared to that at the adjoining Elbee site. If this is the case, then differences noted in depth and particular soil horizon association are likely a function of localized stratigraphic variability. It is therefore our thinking that the Late Plains Village components in B terrace settings at Karishta and Elbee are probably one in the same. However, additional field research would be needed to confirm these observations.

a

b

Figure 3.31. Profile photographs of F201 cutbank, Elbee site. a: F201 exposed in cutbank and the north side of the cutbank profile with ashy, gray band, west view (KNRI-10-057). b: Close up of F201 cutbank profile, north side, west view (KNRI-10-058).

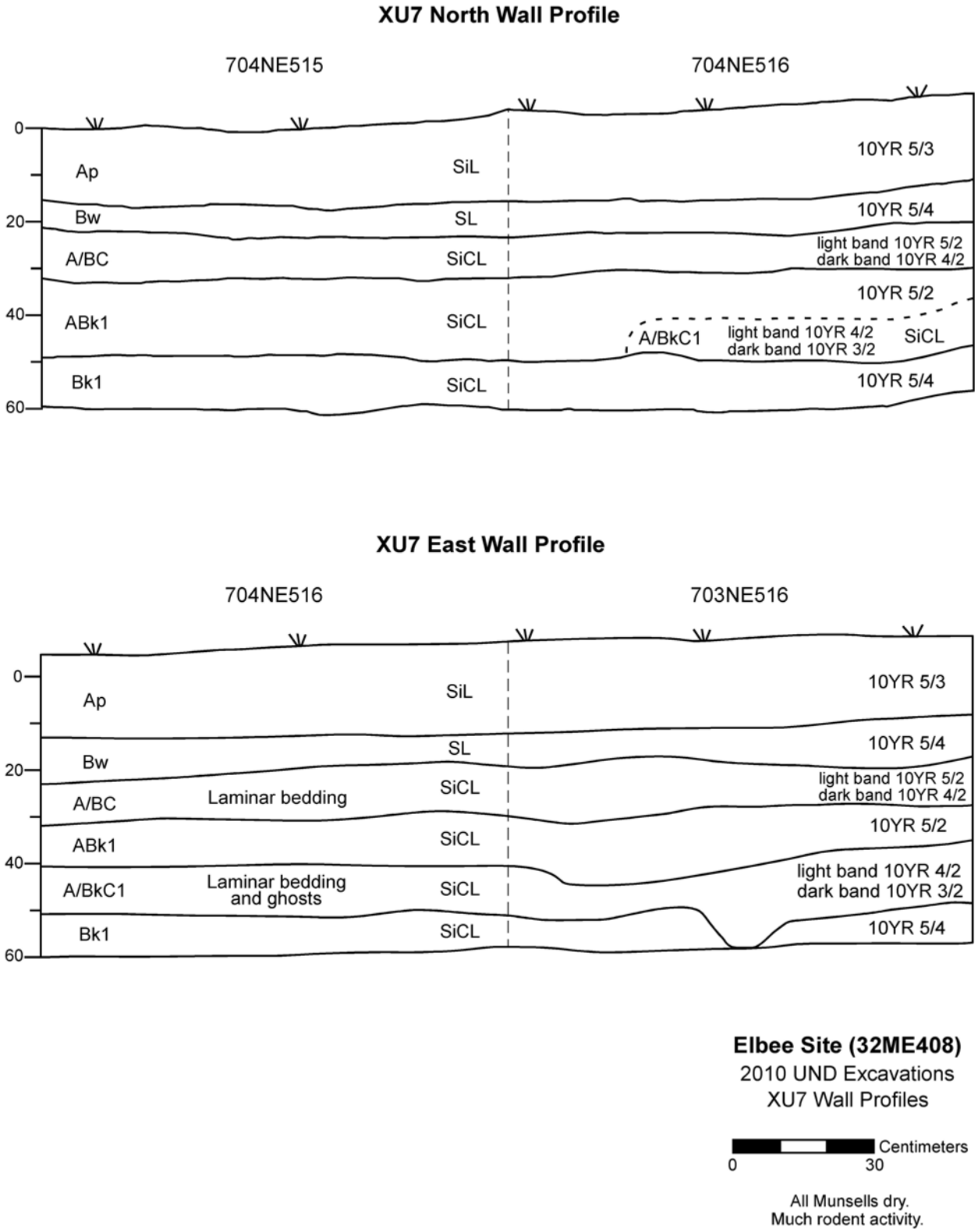

Figure 3.32. Profile drawings of XU7, north and east walls, Elbee site.

a

b

Figure 3.33. Profile photographs of XU7, Elbee site. a: XU7, north wall profile, north view (KNRI-10-124). b: XU7, east wall profile, east view (KNRI-10-125).

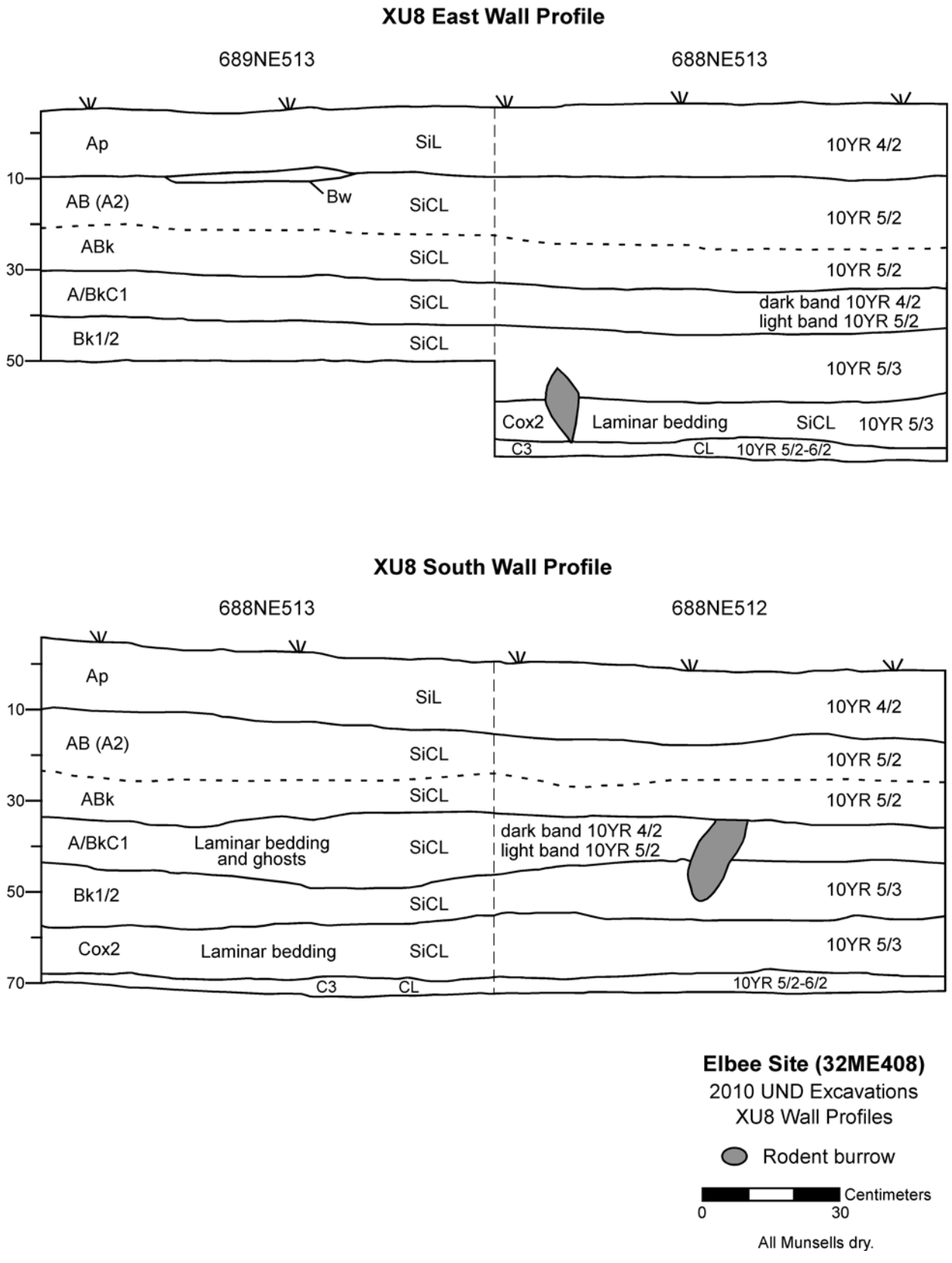

Figure 3.34. Profile drawings of XU8, east and south walls, Elbee site.

a

b

Figure 3.35. Profile photographs of XU8, Elbee site. a: XU8, east wall profile, east view (KNRI-10-144). b: XU8, south wall profile, south view (KNRI-10-145).

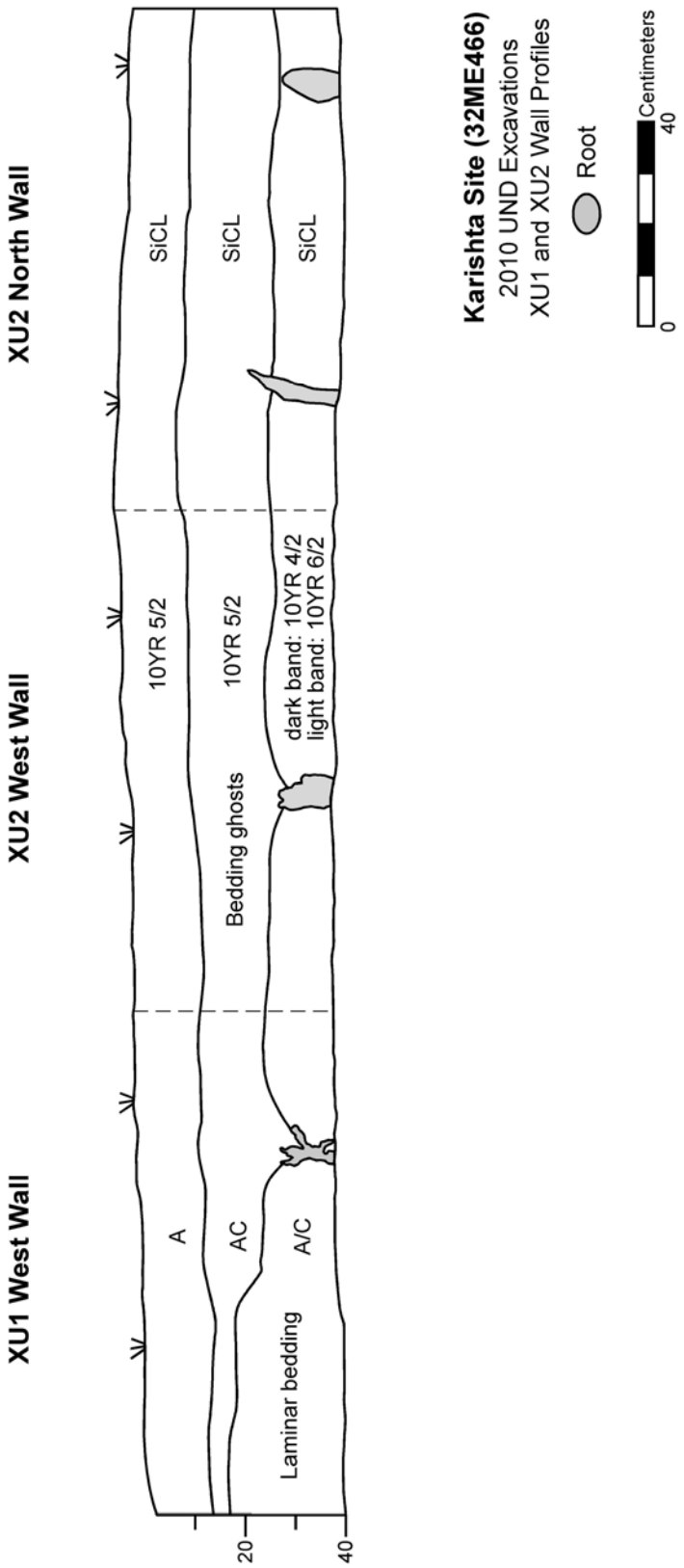

Figure 3.36. Profile drawings of XU1-2, west and north walls, Karishta site.

a

b

Figure 3.37. Profile photographs of XU1-2, Karishta site. a: XU1-2, west wall profile, west view (KNRI-10-115). b: XU1-2, north wall profile, north view (KNRI-10-118).

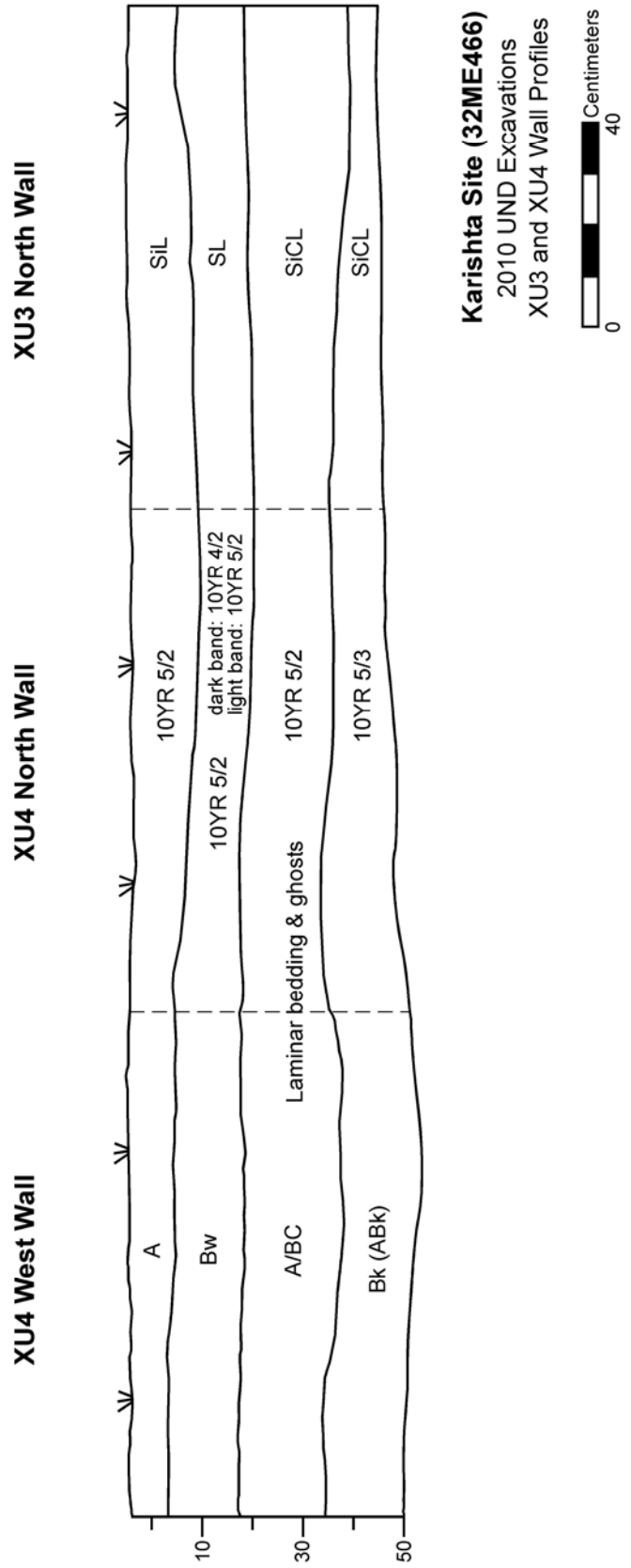

Figure 3.38. Profile drawings of XU3-4, west and north walls, Karishta site.

a

b

Figure 3.39. Profile photographs of XU3-4, Karishta site. a: XU3-4, west wall profile, west view (KNRI-10-203). b: XU3-4, north wall profile, north view (KNRI-10-205).

XU5-6 Profile. XU5-6 was dug into the edge of the main body of the B terrace just beyond the northern boundary of the Karishta site, as originally defined. The profile of the unit shows Ap over Bw over A/BC horizons to a depth of 40 cm (Figures 3.40 and 3.41). This is the same sequence recorded in the XU3-4 profile, except that the horizons in XU5-6 are somewhat thicker and deeper. Level 3 (20-30 cm sd) in XU5-6 produced scant artifacts, but Level 4 (30-40 cm sd) produced none. It was therefore decided to terminate the unit at 40 cm. The Level 3 artifacts were associated with the Bw horizon in XU5-6, rather than the A/BC horizon as in XU3-4. We are at a loss to explain this difference, except to note that it is possible the Level 3 artifacts were displaced upward in the profile from deeper in the A/BC horizon. In hindsight, it would have been enlightening in this regard to have dug XU5-6 deeper, through the A/BC horizon. Nonetheless, a few artifacts were recovered from the unit, confirming the presence of a low-density artifact deposit at this location.

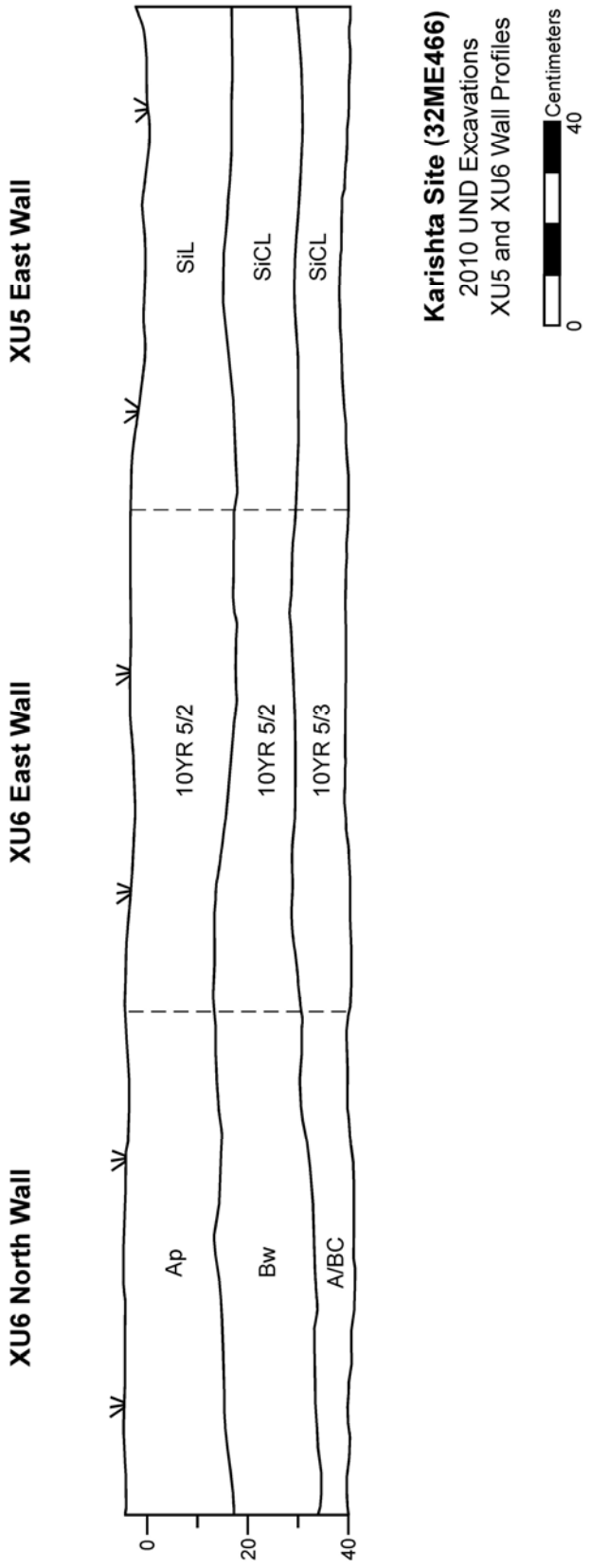

Figure 3.40. Profile drawings of XU5-6, east and north walls, Karishta site.

a

b

Figure 3.41. Profile photographs of XU5-6, Karishta site. a: XU5-6, east wall profile, east view (KNRI-10-245). b: XU5-6, north wall profile, north view (KNRI-10-250).

Chapter 4
ELBEE SITE (32ME408) ANALYSIS AND FINDINGS

Artifact Distributions and Densities

Data on the distribution of major artifact classes by excavation unit (XU), level, and soil horizon association are listed in Table 4.1. XU5 and XU9, dug into the main village site area in the surface of the A terrace area, will be considered first. XU6, XU7, and XU8 are considered separately below under B terrace units.

A Terrace Units

XU5, located at the north end of the extant A terrace area, produced the highest number of artifacts of any unit dug at the site, including 227 native ceramic sherds, 21 stone tools, 188 pieces of larger flake debris, 77 pieces of fire-cracked rock (FCR), and 61 pieces of animal bone debris (Table 4.1). This total of 574 specimens from major prehistoric artifact classes calculates to an average density of 143.5 artifacts per square meter (m^2) of excavated area (574/4 m^2).

XU9, located in the south-central part of the A terrace area, yielded fewer artifacts than XU5 but was still quite productive nonetheless. XU9 produced 77 native ceramic sherds, four stone tools, 26 pieces of larger flake debris, 23 pieces of FCR, and 112 pieces of animal bone debris, for a total of 242 specimens from major artifact classes (Table 4.1). This calculates to an average density of 60.5 artifacts per m^2 of excavated area (242/4 m^2).

Given the findings of previous excavations at Elbee in the A terrace area (Ahler ed. 1984; Toom et al. 2004), as well as those reported here, there is no doubt that this part of the site contains the remains of an earthlodge village deposit that originates in the surface A horizon.

B Terrace Units

Only XU6, in the B terrace area, produced appreciable numbers of artifacts. In fact, XU6 yielded the second highest number of artifacts among the 2010 units dug at the site (Table 4.1). This was largely because of the recovery of quantities of native ceramic body sherds and animal bone fragments from the bottom level of the unit, in association of the F201 hearth exposure in the adjacent cutbank. Overall, XU6 produced 76.0 artifacts per m^2 of excavated area (304/4 m^2), as compared to 9.75 artifacts per m^2 (39/4 m^2) for XU7 and a mere 1.5 artifacts per m^2 (6/4 m^2) for XU8 (Table 4.1).

The vertical distribution of artifacts from the three deeper excavation units dug in the B terrace at Elbee indicates the presence of two archeological zones, one associated (more or less) with the A/BkC1 horizon and the other associated with the Cox2 horizon (Table 4.1). Other artifacts found in these units, not associated with either of these two horizons, are thought to be vertically displaced in the profiles, mainly by burrowing animals.

Archeological Components and Analytic Units

Temporal-cultural diagnostic artifacts and radiocarbon dates were used to determine the component makeup of the 2010 excavations conducted at the Elbee site, as discussed in the paragraphs that follow. The observations made on diagnostic artifacts in this section are for purposes of analytic unit definition only and are more fully supported later in the respective analytical sections.

Table 4.1. Summary Artifact Data by Excavation Unit, Level, and Soil Horizon Association for the Elbee Site (32ME408), 2010 UND Fieldwork. XU5 and XU9 were dug into the A terrace area; XU6, XU7, and XU8 were dug into the B terrace area. Size grade specifications (G1, G2, G3, G4, G5) can be found on page 2.3.

Unit	Square Coordinates	Level	Soil Horizon	G1-3 Native Ceramics (n)	G1-4 Stone Tools (n)	G1-3 Flake Debris (n)	G1-3 Fire-Cracked Rock Debris (n)	G1-3 Animal Bone Debris (n)	Total (n)
XU5	590-591N	1	Ap	70	8	54	19	18	169
	E547-548	2	Ap	119	7	86	43	32	287
		3	AB	38	6	48	15	11	118
			Subtotal	*227*	*21*	*188*	*77*	*61*	*574*
XU9	465-466N	1	Ap	3	0	6	5	13	27
	E526-527	2	Ap	31	1	12	9	47	100
		3	Ap-A	43	3	8	9	52	115
			Subtotal	*77*	*4*	*26*	*23*	*112*	*242*
XU6	677-678N	1	Ap-Bw	0	0	1	0	0	1
	E517-518	2	Bw-A/BC	1	0	0	0	0	1
		3	A/BC-ABk1	0	0	0	0	0	0
		4	ABk1	0	0	0	0	0	0
		5	A/BkC1	2	1	1	0	33	37
		6	A/BkC1-Bk1	0	1	0	0	12	13
		7	ABk2	0	0	0	0	5	5
		8	Bk2	0	0	0	0	3	3
		9	Cox2	68	2	1	7	166	244
			Subtotal	*71*	*4*	*3*	*7*	*219*	*304*
XU7	702-703N	1	Ap	0	0	0	0	0	0
	E517-518	2	Ap-Bw	0	0	0	1	1	2
		3	Bw-A/BC	0	0	0	0	0	0
		4	ABk1-A/BkC1	1	0	0	4	10	15
		5	A/BkC1-Bk1	0	0	1	5	12	18
		6	Bk1	0	1	0	0	3	4
			Subtotal	*1*	*1*	*1*	*10*	*26*	*39*
XU8	688-689N	1	Ap	0	0	0	1	0	1
	E512-513	2	Ap-AB(A2)	1	1	0	0	0	2
		3	AB-ABk	0	0	0	0	0	0

Unit	Square Coordinates	Level	Soil Horizon	G1-3 Native Ceramics (n)	G1-4 Stone Tools (n)	G1-3 Flake Debris (n)	G1-3 Fire-Cracked Rock Debris (n)	G1-3 Animal Bone Debris (n)	Total (n)
		4	A/BkC1	0	0	1	0	1	2
		5	Bk1/2	0	0	0	0	0	0
		6	Bk1/2-Cox2	0	0	0	0	0	0
		7	Cox2-C3	0	0	0	0	1	1
			Subtotal	*1*	*1*	*1*	*1*	*2*	*6*
			Total	**377**	**31**	**219**	**118**	**420**	**1165**

Diagnostic Artifacts

No typologically classifiable projectile points were recovered from the test excavations, but four small, thin, patterned biface specimens do reveal evidence of arrow point technology. These four specimens are unfinished and were broken and/or discarded during manufacture (Use-Life 2 specimens). Arrow point technology is minimally indicative of Late Prehistoric period occupations in the Northern Plains. No evidence of dart point technology was noted among the recovered stone tools.

Rim sherds from the Elbee excavations all derive from everted-rim vessels with straight-to-out-curved rim forms. The few vessels represented fall within two traditional ware groups: (1) Riggs ware and (2) Buchanan ware. Buchanan ware is associated with the Northeastern Plains Village complex (Michlovic and Swenson 1998), dating to the Middle and Late periods of the complex, from ca. A.D. 1300-1800 (Toom 2004). Riggs ware, as originally defined, covers a broad time frame, extending from ca. A.D. 1200 into the A.D. 1700s. Riggs ware is most commonly associated with the Extended and Terminal variants of the Middle Missouri tradition (Calabrese 1972; Lehmer 1966; Wood 1967; Wood and Woolworth 1964), but it is also found in northern Post-Contact variant assemblages of the Coalescent tradition (e.g., Lehmer et al. 1978). Riggs ware also has been linked to certain Plains Village complexes defined in the Knife River region (Ahler and Swenson 1993). More recently, Riggs ware has been restricted to the ca. A.D. 1200-1400 time frame of the Extended Middle Missouri variant, based on a rather narrow redefinition of the ware (Ahler 2001:35-38). For purposes of this study, the original, broader definition of Riggs ware is maintained.

The three vessels (rim sherds) classifiable as Riggs ware or Buchanan ware in the 2010 Elbee ceramic assemblage are indicative of Middle-to-Late period Plains Village components, dating somewhere between ca. A.D. 1300-1800. Rim sherds from one of the Riggs ware vessels are noticeably thicker than sherds from the other Riggs ware vessel and the Buchanan vessel. Late Plains Village sherds tend to be thicker than Middle Plains Village sherds, suggesting the presence of both Late and Middle period components. Surface treatments recorded for the larger body sherds in the assemblage were predominantly smoothed (plain) or simple stamped, consistent with Middle-to-Late Plains Village ceramics. Two body sherds exhibit brushing, which is typically considered a Late Plains Village attribute. It is probably no coincidence that the thicker Riggs ware rims and the two brushed body sherds are from the same excavation unit, XU9, suggesting a Late Plains Village component for it. Likewise, the thinner Riggs ware and Buchanan ware rims are from XU5, at the other end of the site, perhaps pointing to a Middle Plains Village component for it. The radiocarbon dates from the site are consistent with these ceramic interpretations, which are, admittedly, based on a very small sample of material.

2010 and 2009 Radiocarbon Dates

Three radiocarbon dates were run on sample materials collected from the site in 2010 by UND. Included among this group is a fourth date run on a sample taken from the F201 hearth exposure in 2009 by NPS personnel (Table 4.2). The three UND dates are accelerator mass spectrometer (AMS) dates run by the National Ocean Sciences (OS) AMS facility at the Woods Hole Oceanographic Institution, Woods Hole, MA; the NPS date is also an AMS date but it was run by Beta Analytic Inc., Miami, FL. Two of the OS dates were run on wood charcoal samples and the third was run on a bison bone sample. The Beta date was run on wood charcoal.

The four radiocarbon dates represent a broad temporal range, with laboratory ages separated by as much as 390 years (Table 4.2). The three dates from Feature 201 (OS-85446, OS-85447, and Beta-260975) are statistically equivalent at the 95% probability level, making averaging appropriate. All three dates were run on wood charcoal from, presumably, the same wood fuel that was last burned in the hearth. The two OS dates derive from the same bulk sample of wood charcoal that was identified as Salicaceae (willow family), including willow and cottonwood; willow was the preferred but uncertain identification (Appendix A). It is assumed that the Beta date sample was comprised of the same material collected from the hearth the previous year. The weighted average of the three dates for Feature 201 is calculated as 560±20 RCYBP, which has a two-sigma calibrated date range of A.D. 1310-1420, and a calibrated median date of A.D. 1360 (Table 4.2). Given these results, it is reasonable to conclude that the F201 hearth dates to around the middle A.D. 1300s.

Table 4.2. Radiocarbon Dates and Sample Information for the Elbee Site (32ME408), 2010 UND Fieldwork and 2009 NPS Fieldwork. Calibration data are from the OxCal v4.1 program (Bronk Ramsey 2009), based on Intercal09 atmospheric dataset (Reimer et al. 2009).

Lab No.	Provenience	UND Sample No.	Sample Material	Laboratory Age (RCYBP)[a]	$\delta^{13}C$	Calibrated One Sigma Range (68%)	Calibrated Two Sigma Range (95%)	Calibrated Median
OS-85446	Feature 201, basin hearth, cutbank exposure (fcn 2177)	32ME408-6	0.2 g wood charcoal (willow family)	585±30	-23.54‰	A.D. 1310-1410	A.D. 1290-1420	A.D. 1350
OS-85447	Feature 201, basin hearth, cutbank exposure (fcn 2177)	32ME408-7	0.2 g wood charcoal (willow family)	530±30	-23.54‰[b]	A.D. 1390-1440	A.D. 1320-1440	A.D. 1410
Beta-260975	Feature 201, basin hearth, cutbank exposure	NPS sample (2009)	Wood charcoal	580±40	-23.80‰	A.D. 1310-1410	A.D. 1290-1430	A.D. 1350
Weighted Average of the Three Feature 201 Laboratory Ages (statistically equivalent, 95% probability)				560±20		A.D. 1320-1420	A.D. 1310-1420	A.D. 1360
OS-85872	Feature 202, posthole, bison scapula hoe (fcn 2116)	32ME408-8	3.4 g bone (bison)	195±35	-18.11‰	A.D. 1660-1810[c]	A.D. 1650-1810[c]	A.D. 1770

[a]RCYBP: radiocarbon years before present (before A.D. 1950), 5568-year radiocarbon half-life, laboratory corrected (normalized) for isotopic fractionation.
[b]Same value as OS-85446 is assumed; both dates are from the same bulk sample of material.
[c]Date ranges of low probability and obviously too young were discarded.

The bison bone sample for OS-85872, taken from Feature 202, a posthole uncovered in XU9, produced a radiocarbon age of 195±35 RCYBP. This date yields a two-sigma calibrated date range of A.D. 1650-1810, and a calibrated median date of A.D. 1770 (Table 4.2). A date in the late A.D. 1700s for the F202 posthole is indicated.

The F202 date is much later than the average F201 date, by about four centuries, indicating in no uncertain terms that F201 and F202 represent different archeological components of decidedly different ages. In terms of regional chronology, the F201 hearth dates to the Middle Plains Village period, and the F202 posthole dates to the Late Plains Village period.

2003 Radiocarbon Dates

Five radiocarbon dates were run on samples collected from the Elbee site in 2003, with all sample materials recovered from feature excavations in the northern part of the A terrace village (Table 4.3). All were AMS dates done by the National Ocean Sciences (OS) AMS facility. Three dates were run on wood charcoal samples, one was a corn (*Zea mays*) sample, and one was a carbon residue sample from the exterior of a large rim sherd.

As a group, the five OS radiocarbon dates offer a rather broad temporal range, with laboratory ages separated by as much as 145 years (Table 4.3). The three wood charcoal dates (OS-44007, OS-44008, and OS-44009) were the first samples to be submitted from the 2003 fieldwork. Each consisted of twig-sized pieces of charcoal, collected from the fill of three excavated features, two storage pits and a hearth (Toom et al. 2004). By selecting what we thought were short-growth pieces (twigs), it was hoped that the problem of dating old wood (old-growth material) could be avoided (Schiffer 1986).

Two of the three wood charcoal radiocarbon ages are in good agreement, but the third is from 80-105 years younger than the other two. Even though the three dates are statistically equivalent at 95% probability, it was decided to run two more dates, one on corn (maize) from a storage pit and one on carbon residue from a large rim sherd (Buchanan ware, vessel 201), to try and narrow the date range down even more. Corn is an annual plant that should give superior results vis-à-vis the date of occupation because archeological association and old-growth problems do not apply. Also, we have had good results in dating carbon residue on ceramics sherds from other sites, which allows for direct dating of ceramic vessels. While corn did not enjoy a very favorable reputation as a reliable sample material in the early years of radiocarbon dating, work by Creel and Long (1986) has shown that corn dates are just as accurate as dates based on other materials when the laboratory ages are properly normalized. Normalization is a correction factor that takes into account isotopic fractionation differences among various organic materials. Isotopic fraction differences, particularly between woody C_3 (Calvin cycle) and non-woody C_4 (Slack-Hatch cycle) plants can produce significant radiocarbon age differences in the absence of normalization (see Taylor 1987:120-123). Corn dates must be normalized to make them comparable to wood dates because corn is a non-woody C_4 plant and wood, a C_3 plant, is the standard for radiocarbon dating. In fact, it is now routine to normalize all laboratory radiocarbon ages to the -25‰ PDB standard for wood.

The two additional radiocarbon dates run from 2003 samples did not help much in narrowing the date range for the Plains Village component at Elbee. On the contrary, while the carbon residue date (OS-45412) was consistent with the three wood charcoal dates run previously, the corn date (OS-45301) was much younger than the other four dates (Table 4.3). In fact, the corn date was so much younger in age that it invalidated the statistical equivalency of all five dates taken together. Given its provenience, the corn date should have been at least equivalent to the OS-44008 wood charcoal date and the OS-45412 carbon residue date, because all three of these samples came from the fill of the same storage pit (F102).

Values of $\delta^{13}C$ also are useful in confirming or even determining identifications of sample materials (see Taylor 1987:Figure 5.7). For example, the $\delta^{13}C$ value of -10.10‰ for the corn date (OS-45301) indicates that the maize (*Zea mays*) identification for this sample is correct because it is near the average value for C_4 plants, and consistent is with other Middle Missouri corn values (e.g., Toom 1992a; 1992b:216). Furthermore, the carbon residue sample material for OS-45412, taken from the exterior of a Buchanan ware rim sherd, derives from firewood, rather than food. We know this because its $\delta^{13}C$ value

Table 4.3. Updated Radiocarbon Date and Sample Information from Previous Work at the Elbee Site (32ME408). Calibration data are from the OxCal v4.1 program (Bronk Ramsey 2009), based on Intercal 2009 atmospheric dataset (Reimer et al. 2009).

Lab No.	Sample and Provenience Data	Lab Age (RCYBP)[a]	Calibrated Ages		
			One Sigma Range (68%)	Two Sigma Range (95%)	Median
OS-44007 (UND 2003)[b]	Wood charcoal, twig-sized ($\delta^{13}C$ -25.16‰) XU3-F101 basin hearth water screen sample	470±35	A.D. 1420-1450	A.D. 1400-1480	A.D. 1430
OS-44008 (UND 2003)	Wood charcoal, twig-sized ($\delta^{13}C$ -24.99‰) XU1-F102 storage pit hand-picked sample	495±30	A.D. 1410-1440	A.D. 1390-1450	A.D. 1430
OS-44009 (UND 2003)	Wood charcoal, twig-sized ($\delta^{13}C$ -25.57‰) XU2-F103 storage pit hand-picked sample	390±30	A.D. 1440-1620	A.D. 1440-1640	A.D. 1490
OS-45412 (UND 2003)	Carbon residue, rim sherd (Buchanan ware, vessel 201) ($\delta^{13}C$ -24.88‰) XU1-F102 storage pit plotted artifact sample	435±25	A.D. 1430-1460	A.D. 1420-1490	A.D. 1450
Weighted Average, Four OS Lab Ages (statistically equivalent, 95% probability)		445±15	A.D. 1430-1450	A.D. 1420-1460	A.D. 1440
OS-45301 (UND 2003)	Burned corn (maize) ($\delta^{13}C$ -10.10‰) XU1-F102 storage pit water screen sample	325±35	A.D. 1510-1640	A.D. 1470-1650	A.D. 1560
SMU-797 (UND 1978)[d]	Wood charcoal (date not normalized) F4-L2 storage pit water screen sample	440±40	A.D. 1420-1480	A.D. 1400-1620	A.D. 1450
SMU-1101 (UND 1978)	Wood charcoal (date normalized) F4-L2 storage pit hand-picked sample	270±40	A.D. 1520-1670[c]	A.D. 1480-1680[c]	A.D. 1620
SMU-1103 (UND 1978)	Wood charcoal (date normalized) F4-L4 storage pit water screen sample	330±30	A.D. 1490-1640	A.D. 1470-1650	A.D. 1560
Weighted Average, Two SMU Lab Ages (statistically equivalent, 95% probability)		310±25	A.D. 1520-1650	A.D. 1490-1650	A.D. 1560

[a]Radiocarbon years before present (before A.D. 1950), 5568-year radiocarbon half-life.
[b]Source: Toom et al. 2004:4.4-4.9.
[c]Date ranges of low probability and obviously too young were discarded.
[d]Source: Ahler ed. 1984:34.

of -24.88‰ is near the average for woody C_3 plants, as are the $\delta^{13}C$ values for the three wood charcoal dates. We thus have four dates based on wood (or wood-like) materials and one date based on corn. However, it is the corn date that stands out as anomalous when compared to the other dates. In addition, the spread among the four wood-based dates, assuming a single component occupation of short duration, as noted above, might be indicative of the use of old-growth wood of variable ages as sample material. If true, this would bring into question the accuracy of the wood-based dates with respect to the date of site occupation.

The five OS dates from the 2003 samples are not statistically equivalent at 95% probability, so averaging would not be appropriate. However, if the corn date is dropped from the calculations, the other four OS dates are statistically equivalent and can be averaged. The laboratory ages of the four OS dates have a weighted average of 445±15 RCYBP. This translates into a two sigma calibrated date range of A.D. 1420-1460, with a calibrated median date of A.D. 1440. One the other hand, the single corn date has a two sigma calibrated date range of A.D. 1470-1650, with a calibrated median date of A.D. 1560 (Table 4.3). The calibrated median dates of the wood-based date average and the single corn date are 120 years apart. Depending on which sample medium one prefers, the village component in the northern part of the A terrace at Elbee could date to either the middle A.D. 1400s or the middle A.D. 1500s. In reporting the 2003 investigations at Elbee, Toom singled out the corn date as potentially the most accurate (Toom et al. 2004:4.6). In retrospect, it is probably not sound thinking to give such interpretative weight to one corn date at the expense of four wood-based dates, no matter the reasoning used. Therefore, based on a reassessment of the 2003 radiocarbon dates, the northern A terrace village component is dated to the middle A.D. 1400s, keeping in mind that a date as late as the middle A.D. 1500s is still a possibility.

1978 Radiocarbon and TL Dates

Three previous radiocarbon dates for the primary A terrace Plains Village component at Elbee were obtained from wood charcoal samples collected in 1978 from the same archeological feature, Feature 4, a large storage pit (Ahler ed. 1984:33-37). These three dates show a broad range of values, not unlike the 2003 dates, with laboratory ages spanning some 170 years (Table 4.3). The 1978 dates are all from the same feature, whose construction and eventual filling would represent a short duration event. The association of three radiocarbon dates of variable ages in the same archeological feature lends support to the idea that the variation in ages noted among the wood-based radiocarbon dates from Elbee is most likely the result of variable-age wood samples, not variable-age archeological features.

The oldest of the three 1978 dates (SMU-797) has a two sigma calibrated date range of A.D. 1400-1620, with a median calibrated date of A.D. 1450 (Table 4.3). It is in good agreement with the four 2003 wood-based dates. On the other hand, SMU-1103, with a two sigma calibrated date range of A.D. 1470-1650 and a median calibrated date of A.D. 1560, is virtually identical to the 2003 corn date (OS-45301). The radiocarbon age of SMU-1101 is younger than the 2003 corn date, but their two sigma calibrated date ranges are essentially the same. The three 1978 radiocarbon dates present us with mixed results. One date supports a date of occupation in the middle A.D. 1400s for the northern A terrace village at Elbee, while the other two point to an occupation date in the middle A.D. 1500s.

The three 1978 radiocarbon dates are not statistically equivalent at 95% probability, making averaging inappropriate. The older radiocarbon age of SMU-797 is the cause of the statistical discrepancy. When it is dropped from the calculations, the two younger SMU dates are statistically equivalent and may be averaged. SMU-1101 and SMU-1103 have a weighted average radiocarbon age of 310±25 RCYBP, which translates into a two sigma calibrated date range of A.D. 1490-1650, with a median calibrated date of A.D. 1560 (Table 4.3). The calibration values for the 1978 two-date average are nearly identical to those of the 2003 corn date, supporting a later time frame for the northern A terrace village at Elbee in the middle A.D. 1500s.

Four thermoluminescence (TL) dates also were obtained from pottery sherds recovered in 1978 from Feature 4, the same storage pit that produced the wood charcoal radiocarbon samples. These dates also show considerable variation, with differences of up to 250 years between ages, for an apparent short duration event, the filling of the pit. Nevertheless, the two-sigma range of the average of the TL dates, ca. A.D. 1465-1685, agrees fairly well with the two sigma calibrated date range of the two-date average of the 1978 radiocarbon dates (Table 4.4).

Table 4.4. Thermoluminescence Dates and Sample Information for the Elbee Site (32ME408), 1978 UND Fieldwork (Ahler ed. 1984:34).

Laboratory Number	Provenience	Sample Material	Laboratory Age (TLYBP)[a]	One Sigma Calendar Date Range	Two Sigma Calendar Date Range
WU-TL84j1	F4-L1 storage pit	pottery sherd	360±30	A.D. 1590-1650	A.D. 1560-1680
WU-TL84j2	F4-L1 storage pit	pottery sherd	310±25	A.D. 1645-1695	A.D. 1620-1720
WU-TL84j3	F4-L2 storage pit	pottery sherd	560±45	A.D. 1375-1465	A.D. 1330-1510
WU-TL84j4	F4-L4 storage pit	pottery sherd	390±35	A.D. 1555-1625	A.D. 1520-1660
Average TL Date			405±55	A.D. 1520-1630	A.D. 1465-1685

[a]TLYBP: thermoluminescence years before present (before A.D. 1980).

TL dating often yields inconsistent results because it is subject to a number of environmental variables that are difficult to control for, such as fluctuations in soil moisture and measurement of local radiation sources. For this reason, it did not gain wide acceptance as an archeological dating technique in the United States. Still, there is some comfort in finding agreement between two independent dating techniques for the same archeological component.

Radiocarbon Dating Summary

Four different groups of dates can be seen in the plot of the calibrated date ranges and median dates for the 12 radiocarbon dates currently available for the Elbee site (Figure 4.1). The first group, made up of OS-85446, Beta-260975, and OS-85447, includes the three new radiocarbon dates run on wood charcoal sample material from the F201 hearth exposure. These three dates form a tight cluster at the earliest end of the calibrated date (calAD) time scale. The average of these three dates places the date of the F201 hearth between cal. A.D. 1310-1420 at 95% probability (Table 4.2). This result makes F201 the oldest dated feature at Elbee, and slightly older than any of the dated features associated with the main village occupation in the northern part of the A terrace. On this basis, it is reasonable to conclude that F201 stands apart and is not associated with the main village occupation at the site.

The second, slightly later group of radiocarbon dates relates to the main village occupation in the northern part of the A terrace. This group includes the wood-based (wood charcoal and rim sherd carbon) dates OS-44008, OS-44007, OS-45412, SMU-797, and OS-44009. It dates the main village occupation at the site to between cal. A.D. 1420-1460 at 95% probability, based on the average of the four OS dates and SMU-797 (Table 4.3). The third group of radiocarbon dates is also associated with the main village occupation and consists of SMU-1103, OS-45301, and SMU-1101. It dates the main village occupation to between cal. A.D. 1470-1650 at 95% probability, based on the average of the two SMU dates and OS-45301 (Table 4.3). The group two and group three dates present us with a temporal anomaly: group two dates the main village occupation rather precisely to the middle A.D. 1400s, while group three dates this same component to somewhere around the middle A.D. 1500s, a difference of about 100 years. While not an overly large number in terms of the limits of precision in radiocarbon dating, 100 years difference is large enough to significantly affect archeological interpretations in late prehistoric times, when culture change sometimes can be measured in terms of decades rather than centuries.

The fourth group is not a group at all but consists of a single date: OS-85872. It is at the latest end of the calibrated date (calAD) time scale and is clearly separate from the other dates obtained for the

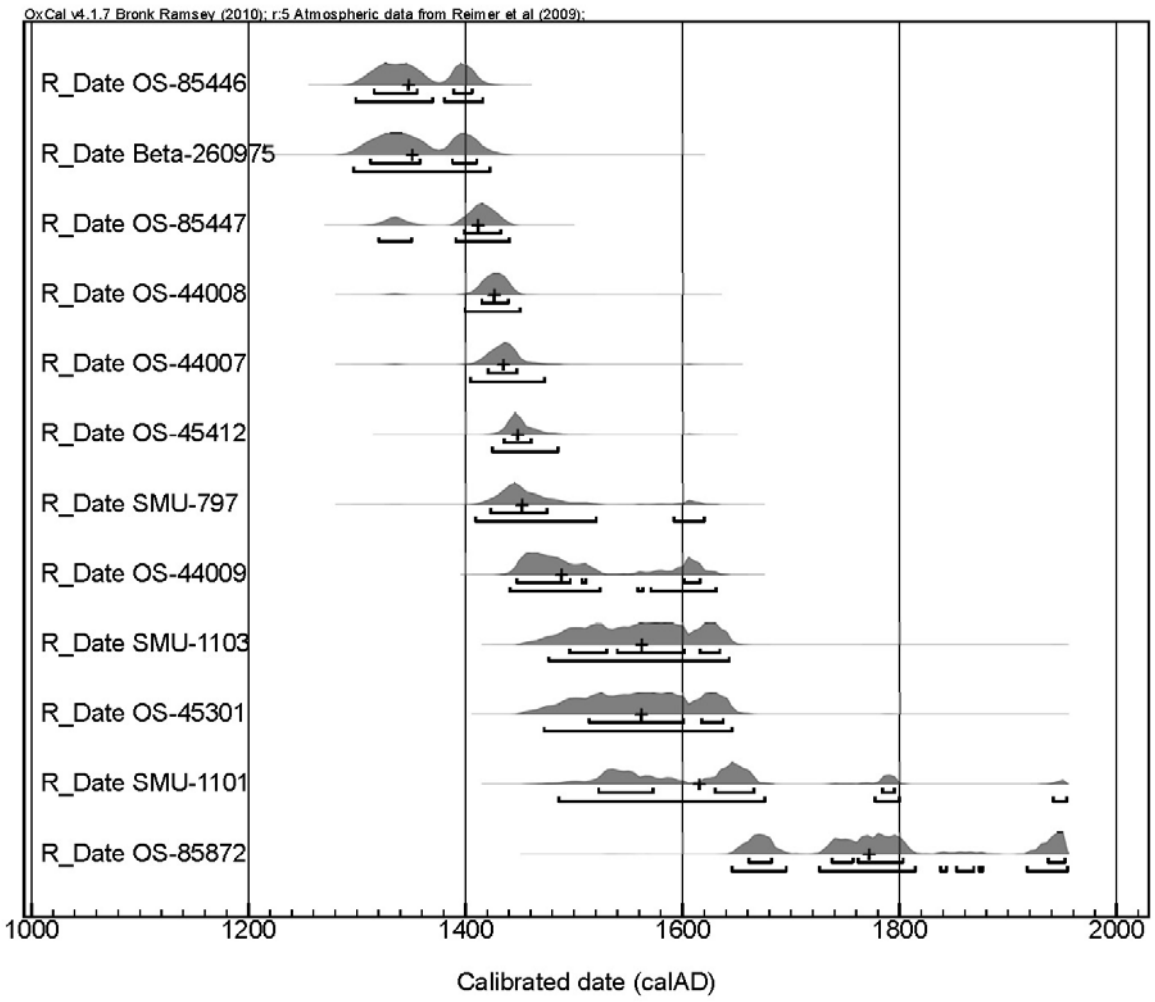

Figure 4.1. Chronologically ordered plot of the twelve radiocarbon dates for the Elbee site (32ME408).

site (Figure 4.1). OS-85872 is indicative of a Late Plains Village component in the southern part of the A terrace at Elbee, an occupation that is clearly younger than the main village component by around 200-300 years based on median dates. This single date places the Late Plains Village component on the A terrace at Elbee between cal. A.D. 1650-1810 at 95% probability; its median date of cal. A.D. 1770 suggests an occupation in the late A.D. 1700s (Table 4.2).

Analytic Unit Definition

The 2010 Elbee excavations can be broken down into four primary analytic units for purposes of reporting: (1) Middle Plains Village-A terrace, (2) Late Plains Village-A terrace, (3) Middle Plains Village-B terrace, and (4) Late Plains Village-B terrace. These analytic units, coded as component analytic units (CAUs), correspond to the primary archeological components identified in different parts of the site.

The Middle Plains Village-A terrace unit (MPV-A) refers to the major village occupation in the northern part of the A terrace area at Elbee. It has been extensively excavated and reported on by previous investigations (Ahler ed. 1984; Toom et al. 2004). We can say with certainty that the MPV-A dates to the Middle Plains Village period, but the precise date of occupation for this village occupation remains uncertain. Radiocarbon dating, discussed above, indicates the component dates to either the middle A.D. 1400s or the middle A.D. 1500s. Unfortunately, the available radiocarbon data are not accurate enough to allow a narrower interpretation. In terms of the 2010 excavations at Elbee, XU5 contained all of the MPV-A levels dug at the site.

In the report on the 2003 excavations at Elbee, it was concluded that the equivalent of what we are calling the MPV-A component here related to a single Middle Plains Village component of probable Scattered Village complex affiliation (Toom et al. 2004). Then as now, the Scattered Village complex interpretation is controversial because of the lack of S-rim pottery in the assemblage. Nevertheless, the presence of pottery classifiable as Buchanan ware clearly points to a connection to the Northeastern Plains Village complex, the proposed predecessor of the Scattered Village complex (Toom 2004). Current thinking is that the Scattered Village complex component at Elbee must be an early manifestation of the complex because of the lack of S-rim pottery, which is also absent from Early and Middle period Northeastern Plains Village assemblages (cf. Michlovic and Swenson 1998; Toom 2004).

The Late Plains Village-A terrace unit (LPV-A) identifies another village occupation in the southern part of the A terrace area at Elbee. Some hint of this later village component was found in the 1978 excavations, but not enough to more than vaguely note its presence (cf. Ahler ed. 1984). XU9 of the 2010 excavations at Elbee revealed this component in a more or less separate state from the apparently more extensive MPV-A village component. The LPV-A component isolated in the XU9 levels is known to date to the Late Plains Village period based on the OS-85872 radiocarbon date. It reveals a village component in the southern part of the site that dates to the late A.D. 1700s, which is clearly younger than the northern A terrace village. Ceramic attributes also indicate that pottery recovered from XU9 is generally later than that found elsewhere in the site. Regarding the 2010 excavations at Elbee, XU9 contained all of the LPV-A levels dug at the site.

The Middle Plains Village-B terrace unit (MPV-B) is restricted to a relatively small area of the B terrace remnant in the far northern part of the site in the vicinity of XU6. The MPV-B relates entirely to the F201 hearth exposure in the Knife River cutbank opposite XU6. Radiocarbon dating of F201 indicates that this hearth remnant dates to the middle A.D. 1300s. It is therefore the oldest dated feature at the site, predating the MPV-A village component by anywhere from about 100-200 years, when average median dates are considered. Regarding the 2010 excavations at Elbee, the very bottom levels of XU6 are associated with the MPV-B component. The deepest levels in XU8 were also assigned to the MPV-B component because of their stratigraphic association, even though they did not produce any actual artifacts.

The Late Plains Village-B terrace unit (LPV-B) covers much of the B terrace area at Elbee and extends northward into the adjacent Karishta site area. This component represents an ephemeral occupation that did not produce much in the way of artifacts and, as a consequence, is difficult to interpret. Given its lateral extent, apparently covering all or at least most of the B terrace areas of both the Elbee and Karishta sites, it may have functioned as some kind of short-term campsite or activity area

occupation. No radiocarbon dates pertain to the LPV-B component itself. However, it is possible that it dates to the same late A.D. 1700s time frame as the LPV-A component.

Cultural Features

Three primary cultural features were uncovered and excavated by the 2010 excavations at Elbee. Feature numbers for the 2010 excavations were started at 201 to clearly differentiate them from features of the 1978 and 2003 excavations. Feature 201 was the basin-shaped hearth exposure in the Knife River cutbank in the B terrace area; Feature 202 was a shallow posthole uncovered and excavated in XU9 in the A terrace area; and Feature 203 was a series of small stick- or pole-sized holes, also uncovered in XU9. Excavation and interpretation of these features was considered in detail in Chapter 3. Artifacts and other materials recovered from the features, if any, are discussed in the following paragraphs.

Feature 201

No artifacts were recovered from the Feature 201 (F201) hearth, except for a large sample of charcoal. A sample of wood charcoal from F201 was submitted for identification to the PaleoResearch Institute, Golden Colorado. The submitted specimens were identified as Salicaceae (willow family), which includes both willow and cottonwood. Willow was the preferred identification but was uncertain due to the poor condition of the sample material (Appendix A). The wood charcoal material was contained in the bottom of what remained of the hearth basin, covered by sediments that had been burned to a distinctive orange color (see Figure 3.13). The degree of oxidation of the burned earth in the hearth basin indicates that it had contained a rather hot fire of some duration. Feature 201 is associated with and essentially defines the MPV-B component.

Features 202 and 203

The Feature 202 (F202) posthole was of medium diameter and no great depth (see Figures 3.7 and 3.8). It did not therefore appear to be a major structural member of an earthlodge, however, it could have supported some kind of ancillary feature within a lodge. The posthole contained a light-colored fill with no indications of decomposed wood. The only artifacts recovered from the posthole itself were pieces of a broken bison scapula hoe. It is thought that the hoe parts had been used to wedge in the post that the hole once contained.

The series of small stick or pole holes labeled as Feature 203 (F203) were identified as small, round-to-oval, light colored stains observed in contrast to the dark-colored floor of XU9 (see Figures 3.7 and 3.9). Twenty of these small holes were counted extending in a line diagonally across the unit. Only one of these features, F203 proper, was excavated. These features were too small for conventional excavation so an Oakfield soil probe was used to core F203 and provide an idea as to its depth, which was only about 10 cm. The fill of the hole did not contain any decomposed wood and no artifacts were recovered from the selected feature during coring. It is our thinking that this line of small holes could mark the location of an interior screen of an earthlodge, or perhaps the wall of some other kind of lightly built structure. Whatever the case, this line of small holes and the larger posthole (F202) are believed to be parts of the same structure. Features 202 and 203 are associated with the LPV-A component.

Native Ceramics

Native ceramic sherds recovered from the 2010 excavations at the Elbee site total 377 size grade 1-3 (G1-3) specimens, weighing a total of 306.2 g (Table 4.5). These totals include rim sherds and body sherds combined. Rim sherds were counted at only nine specimens, leaving a count of 368 body sherds. No other native ceramic objects, such as balls, gaming pieces, or figurines, were identified in the collection. The majority of the sherds derive from the two A terrace units (XU5 and XU9), with lesser numbers from B terrace unit (XU6, XU7, and XU8). The only B terrace unit to produce appreciable

Table 4.5. Native Ceramics Size Grade Data by Component Analytic Unit (CAU) and Excavation Unit, Elbee Site (32ME408), 2010 UND Fieldwork.

Unit	CAU	Native Ceramics Count[a]					Native Ceramics Weight[a] (g)					Rims	Other
		G1	G2	G3	Total	%	G1	G2	G3	Total	%	G1-3	G1-3
XU5	MPV-A	0	8	219	227	60.2	0.0	29.5	112.3	141.8	46.3	6	0
Subtotal		*0*	*8*	*219*	*227*	*60.2*	*0.0*	*29.5*	*112.3*	*141.8*	*46.3*	*6*	*0*
%		*0.0*	*3.5*	*96.5*	*100.0*		*0.0*	*20.8*	*79.2*	*100.0*			
XU9	LPV-A	0	7	70	77	20.4	0.0	30.6	34.3	64.9	21.2	3	0
Subtotal		*0*	*7*	*70*	*77*	*20.4*	*0.0*	*30.6*	*34.3*	*64.9*	*21.2*	*3*	*0*
%		*0.0*	*9.1*	*90.9*	*100.0*		*0.0*	*47.1*	*52.9*	*100.0*			
XU6	MPV-B	2	17	49	68	18.0	29.7	35.5	31.3	96.5	31.5	0	0
Subtotal		*2*	*17*	*49*	*68*	*18.0*	*29.7*	*35.5*	*31.3*	*96.5*	*31.5*	*0*	*0*
%		*2.9*	*25.0*	*72.1*	*100.0*		*30.8*	*36.8*	*32.4*	*100.0*			
XU6	LPV-B	0	0	2	2	0.5	0.0	0.0	0.4	0.4	0.1	0	0
XU7	LPV-B	0	0	1	1	0.3	0.0	0.0	0.4	0.4	0.1	0	0
Subtotal		*0*	*0*	*3*	*3*	*0.8*	*0.0*	*0.0*	*0.8*	*0.8*	*0.2*	*0*	*0*
%		*0.0*	*0.0*	*100.0*	*100.0*		*0.0*	*0.0*	*100.0*	*100.0*			
XU6	NCD[b]	0	0	1	1	0.3	0.0	0.0	0.3	0.3	0.1	0	0
XU8	NCD	0	1	0	1	0.3	0.0	1.9	0.0	1.9	0.6	0	0
Subtotal		*0*	*1*	*1*	*2*	*0.6*	*0.0*	*1.9*	*0.3*	*2.2*	*0.7*	*0*	*0*
%		*0.0*	*50.0*	*50.0*	*100.0*		*0.0*	*86.4*	*13.6*	*100.0*			
Total		**2**	**33**	**342**	**377**	**100.0**	**29.7**	**97.5**	**179.0**	**306.2**	**99.9**	**9**	**0**
%		**0.5**	**8.8**	**90.7**	**100.0**		**9.7**	**31.8**	**58.5**	**100.0**			

[a]Size grade specifications (G1, G2, G3) can be found on page 2.3.
[b]NCD: not coded; no defined component analytic unit applies.

numbers of sherds was XU6, and nearly all of those derive from the pot base found in Level 9 in association with F201 and the MPV-B component.

The size grade breakdown shows quite clearly that the sample is highly fragmented, with 90.7% of the sherds falling into size grade 3 (G3), the smallest size grade applied to ceramic remains. The plow zone context for the majority of the sherds from A terrace units undoubtedly contributed to their extreme fragmentation. No complete or nearly complete and reconstructable vessels are present in the sample. The pot base uncovered in Level 9 of XU6 was very fragile and highly fragmentary; it was impossible to recover it in anything like intact condition (see Figure 3.12). Vessel size and shape are therefore not possible to estimate with any precision. Suffice it to say that nothing was observed in the sample that would suggest anything other than the globular-shaped pots that are so typical of Plains Village tradition ceramics.

General Ceramic Characteristics

Ceramics in the sample are typical Plains Village on the basis of technology and style. Middle period Plains Village ceramics show great refinement in manufacturing technique, with typically thin-walled bodies and compact paste. Construction, or manufacture, of ceramic vessels at the site was probably done by mass modeling (see Johnson et al. 1991:13; Rice 1987:125; Shepard 1985:55-57). The modeling technique is also referred to as drawing (Rye 1981:72). Following initial modeling of the vessel by hand, final shaping and thinning was accomplished by what is known as the paddle and anvil technique. In this technique, a paddle is used against the outside (exterior) of the vessel, in opposition to an anvil held against the vessel interior (Johnson et al. 1991:13; Shepard 1985:55, 59). Mass modeling and paddle and anvil finishing of ceramic vessels are described by Gilmore (1925) for the Arikaras and by Wilson (1977) for the Mandans and Hidatsas in the ethnographic literature of the Northern Plains.

Simple-stamped exterior surface treatment was identified on the majority of the body sherds for which a positive determination could be made, excluding smoothed (plain) specimens and two brushed specimens, indicating that the paddle applied to the vessel exterior had had linear grooves cut into it, probably to provide a better purchase on the clay. Upper vessel exteriors (rim areas) were uniformly smoothed, an attribute typical of Plains Village vessels, but smoothing to the point of burnishing (polishing) was not observed in the 2010 assemblage.

The paste (clay body) of the pottery from the site would have been made from locally available clay, probably a montmorillonite (a constituent of bentonite), although no analyses were performed to confirm this. The paste was typically moderately compact and uniformly grit tempered with crushed granite. Vessel form was typically globular with well-defined neck and shoulder areas. Vessels showed a very strong tendency for everted (out-flaring) rims. A variety of decorative elements were applied to the vessels, including finger-impressed, tool-impressed, incised, and cord-impressed, decoration; finger-impressed and tool-impressed decoration were recorded on the larger rim sherds, while incised and cord-impressed decoration were noted on two of the larger body sherds (one instance of each). Decoration on rim sherds in this particular assemblage was limited to vessel lip areas; rim areas proper were uniformly plain (smoothed). Sherd colors were mainly buff and light-to-dark gray.

No particular functional assessment was made of the ceramics owing to the highly fragmented condition of the sample. It can be noted, however, that the Elbee vessels were a kind of utilitarian pottery produced for general domestic purposes, such as cooking and perhaps storage. The pottery was probably made on-site for the most part, exclusively for on-site use, and eventually broken and discarded on-site when it was abandoned. For a thoughtful consideration of ceramic vessel function based on data from the Helb site, an Extended Middle Missouri village on the Missouri River in north-central South Dakota, the reader is referred to Rosebrough (1995).

Body Sherds

Body sherds, as the term is generally applied here, are essentially all ceramic sherds lacking a lip; sherds with lips are grouped as rim sherds. The aggregate body sherd sample contains 368 individual specimens, including 2 G1 sherds, 29 G2 sherds, and 337 G3 sherds. Body sherd surface treatments, specifically excluding elements considered decoration, were recorded for G1- and G2-sized

specimens only. Size grade 3 specimens are usually too small to make a positive determination of surface treatment and other definitive attributes and are usually excluded from detailed analysis. Three G2 sherds from the pot base uncovered in Level 9 of XU6 (FCN 2115, KNRI 3488) were removed from the collection and subjected to thin sectioning—a destructive process—to facilitate physical analyses to be conducted apart from this general study. This leaves a total of 28 G1 and G2 body sherds in the collection and available for study. Twenty-six sherds were classifiable as to surface treatment; two sherds were indeterminate and not classified.

The aggregate body sherd sample from Elbee shows predominantly smoothed (57.7%) and simple-stamped (34.6%) surface treatments. The only other surface treatment observed in the sample were two brushed (7.7%) specimens (Table 4.6). The high incidences of smoothing and simple stamping are expected of Middle-to-Late period Plains Village assemblage. Brushing is a Late Plains Village ceramic trait that would be out of place in a Middle period sample. It is therefore no coincidence that the two brushed body sherds were recovered from XU9 and are attributed to the LPV-A component. The majority of the classified sherds (61.5%) derive from the pot base uncovered in Level 9 of XU6, in association with the F201 hearth and assigned to the MPV-B component. The surface treatment breakdown for these sherds is 62.5% smoothed and 37.5% simple stamped, consistent with a Middle Plains Village period interpretation (Table 4.6).

Only two G1 and G2 body sherds in the site sample exhibited decoration. One was a brushed body sherd with a single cord-impressed line, and the other was a smoothed body sherd with two incised lines (non-parallel). The brushed sherd with the cord-impressed line comes from XU9 and is assigned to the LPV-A component. The smoothed sherd with the incised lines was recovered from XU5 and is assigned to the MPV-A component. Both decorative treatments are consistent with their respective components, the cord-impressed line especially so because cord impressions on body sherds (probably a neck sherd) are typical of Late period assemblages.

No variability was seen in body sherd temper. All of the G1 and G2 body sherds in the sample were tempered with crushed granitic rock, often referred to as grit temper. No shell or sand tempering was specifically identified in the assemblage.

Average maximum thickness for the 27 body sherds so measured was 5.58±0.91 mm (one G2 sherd was split and could not be measured). Such a value is generally consistent with the relatively thin-walled vessels of Middle period Plains Village pottery. When we look at maximum thickness by component, however, some interesting differences emerge. The five measured sherds assigned to LPV-A component have an average thickness of 6.37±1.03, appreciably thicker than the average thickness calculated for the aggregate sample. On the other hand, the 16 measured sherds of the MPV-B component, all from or associated with the pot base found in Level 9 of XU6, yield an average maximum thickness of 5.12±0.52 mm, which is thinner than the overall sample average and much thinner than the few sherds from LPV-A levels. The five measured sherds from the MPV-A component produced an average maximum thickness of 6.22±1.09 mm, a value falling between the other two extremes, but closer to the LPV-A average (Table 4.7). What we can take away from these data is that the Middle Plains Village sherds are measurably thinner than the Late Plains Village sherds, as expected.

F201 Body Sherds

Some 68 body sherds were recovered from XU6, Level 9, in association with the F201 basin hearth. These body sherds have a size grade breakdown of two G1 sherds, 17 G2 sherds, and 49 G3 sherds. All but 11 of these sherds derive directly from a pot base that was found intact, slightly depressed into the former ground surface, but too badly cracked and fragile to be recovered whole (see Figure 3.12). These sherds were uniformly dark gray in color, fairly soft, and highly friable, all indications that they were underfired. A simple slake test was used to determine if the sherds were in fact underfired, as described by Rye (1981:111). A small (G3) sherd from the pot base was immersed in water for a 24-hour period. At the end of this time, the sherd completely disintegrated (slaked) at the slightest touch, confirming that it and the other sherds were certainly underfired or possibly not even fired at all.

The pot base in question was found at the same level as F201, no more than about 1.5 m to the northwest of the hearth location proper. It is our thinking that this specimen represents a completed, shaped pot that had been dried to what is referred to as “leather hardness” in preparation for firing (Rice

Table 4.6. Native Ceramic Body Sherd Surface Treatment Data by Component Analytic Unit (CAU), Size Grades 1 and 2 Only, Elbee Site (32ME408), 2010 UND Fieldwork.

CAU		Brushed	Simple Stamped	Smoothed	Total Classified	Indeter-minate	Total Sample
MPV-A	n	0	0	4	4	2	6
	%	--	--	100.0	100.0		
LPV-A	n	2	2	1	5	0	5
	%	40.0	40.0	20.0	100.0		
MPV-B	n	0	6	10	16		16
	%	--	37.5	62.5	100.0		
NCD[a]	n	0	1	0	1	0	1
	%	--	100.0	--	100.0		
Total	**n**	**2**	**9**	**15**	**26**	**2**	**28**
	%	**7.7**	**34.6**	**57.7**	**100.0**		

[a]NCD: not coded; no defined component analytic unit applies.

Table 4.7. Native Ceramic Body Sherd Thickness Data by Component Analytic Unit (CAU), Size Grades 1 and 2 Only, Elbee Site (32ME408), 2010 UND Fieldwork.

Component Analytic Unit	Surface Treatment	Number of Body Sherds	Mean Maximum Thickness (mm)
LPV-A	Brushed	2	7.27±0.89
	Simple Stamped	2	5.45±0.40
	Smoothed	1	6.39±0.00
	Subtotal	5	6.37±1.03
MPV-A	Indeterminate	1	6.20±0.00
	Smoothed	4	6.23±1.26
	Subtotal	5	6.22±1.09
MPV-B	Simple Stamped	6	5.36±0.57
	Smoothed	10	4.97±0.45
	Subtotal	16	5.12±0.52
Not Coded	Simple Stamped	1	5.77±0.00
	Total	27	5.58±0.91

1984:64-65). The pot was then broken prior to firing with its base left intact and slightly depressed into the soft surface of the ground near the hearth, or the pot fractured as a result of underfiring and its intact base was placed on the ground near the hearth for other purposes. Whether or not the F201 hearth was, or was to be, the actual firing mechanism for our hypothetical pot is a matter of conjecture. However, if F201 was part of an open (bonfire) firing of ceramic vessels (Rice 1987:153-158; Rye 1981:96-98), one might expect to find parts of more "waster" vessels that failed during firing than just the sherds from one pot base. Still, the question of F201 as a pottery-firing feature is intriguing and worthy of further consideration.

Table 4.8. Distribution of Native Ceramic Vessel Ware and Type Data by Component Analytic Unit (CAU), Elbee Site (32ME408), 2010 UND Fieldwork.

CAU	Ware	Ware		Decorative Type	Type	
		n	%		n	%
MPV-A	Buchanan	1	50	Decorated Lip (Tool Impressed)	1	50
	Riggs	1	50	Decorated Lip (Finger Impressed)	1	50
	Subtotal	2	100		2	100
LPV-A	Riggs	1	100	Decorated Lip (Finger Impressed)	1	100
	Total	**3**	**100**		**3**	**100**

Rim Sherds and Vessels

The Elbee excavations produced a total of only nine rim sherds, including 0 G1 rims, 4 G2 rims, and 5 G3 rims. The four G2 rims were used as the analytical sample. G3 rims are usually too small and fragmentary for reliable classification and were not analyzed further for purposes of this report. After matching, the four rim sherds were found to represent three different ceramic vessels. These were assigned vessel numbers 301-303 to clearly distinguish them from the vessels in the 1978 and 2003 collections. Each vessel is classified and described below.

Classified rims in the sample relate to two different wares and one general decorative type (Table 4.8). Buchanan ware, associated with the Northeastern Plains Village complex, is represented by one vessel of the Decorated Lip type, Tool Impressed subtype. Riggs ware, typically of Middle Missouri tradition affiliation, but also found in certain Post-Contact Coalescent assemblages, is represented by two vessels of the Decorated Lip type, Finger Impressed subtype. When found in this combination, these ceramic wares and types are indicative of Middle-to-Late period Plains Village components, showing affinities to both the Middle Missouri tradition and the Northeastern Plains Village complex.

The Buchanan vessel and one of the Riggs vessels come from XU5 and are assigned to the MPV-A component. The other Riggs vessel was recovered from XU9 and is assigned to the LPV-A component (Table 4.8).

Buchanan Ware. Buchanan ware is associated with the Northeastern Plains Village (NEPV) ceramic group of the northern Plains Village tradition, or, more specifically, the Northeastern Plains Village complex (Gregg et al. 1996; Michlovic and Swenson 1998; Toom 2004). Originally referred to as Buchanan Flared Rim ware, it was first defined by Wheeler (1963) in his description of the ceramic collection from the Hintz site, located on the James River in Stutsman County, North Dakota. Vessels are typically globular-shaped with strong shoulder expression and somewhat constricted orifice and neck widths—what is thought of as the typical Plains Village vessel form. Constituent wares of the NEPV group, as defined by Michlovic and Swenson (1998), include Lisbon ware and Owego ware in addition to Buchanan ware. All three wares have the same everted, straight to out-curved rim form and are differentiated primarily on the basis of surface treatment: Lisbon ware is cord roughened, Owego ware is check stamped, and Buchanan ware is simple stamped. Smoothed (plain) and burnished surface treatments are also classified as Buchanan ware. Various kinds of decorative elements, such as tool impressions, cord impressions, and incised and trailed lines, are then used to define specific types. Another, fairly unique kind of decoration observed in the ceramic group is channeling of rim lips with a single incised or trailed line (Toom 2004). Decoration on rims tends to be preferentially placed on vessel lip areas, but specimens with decorated rims proper do occur, as do undecorated (plain) rims. Vessel shoulder areas tend to be decorated with combinations of incised and trailed lines and elongated tool impressions in what has been likened to a stylized raptor motif (Toom 2004). S-shaped rims and braced (thickened-lip) rims are not recognized attributes of NEPV ceramics (Michlovic and Swenson 1998).

Some practical problems have been recognized in the classification of Northeastern Plains Village ceramics, following the format proposed by Michlovic and Swenson (1998). These problems are considered in some detail by Toom (2003) for the Kirschenman-III site on the James River in eastern North Dakota, but need not be discussed here because we can reliably infer that the representative NEPV ware is Buchanan. This inference rests on the fact that the predominant positive surface treatment identified among the body sherds was simple stamping, as discussed previously.

Only one general type of Buchanan ware was identified in the 2010 Elbee assemblage: Buchanan Decorated Lip, subtype Tool Impressed. It is described in outline form below.

Buchanan Decorated Lip: n=1; Vessel 302; Figure 4.2a.

Ware: Buchanan (NEPV Group) Type: Decorated Lip Subtype: Tool Impressed
Rim form: straight.
Rim orientation: everted.
Exterior surface treatment: smoothed.
Rim decoration: plain.
Lip decoration: tool impressed.
Lip decorative motif: horizontally repetitive diagonals.
Lip form: beveled-out.
Shoulder decoration: unknown, indeterminate.
Temper: grit (crushed granite).
Paste: compact.
Color: buff.
Appendages: none present.
Orifice diameter estimate: indeterminate, too small for estimate.
Vessel rim wall thickness:
Vessel 302--maximum 6.16 mm; minimum 5.37 mm.
Type Reference: this report (cf. Michlovic and Swenson 1998).

Riggs Ware. Riggs ware, named for the Thomas Riggs site in South Dakota (Hurt 1953), is typically a Middle Missouri tradition ceramic ware, but specimens also occur in Post-Contact Coalescent assemblages, such as those of the Knife River phase (Lehmer et al. 1978). Riggs ware usually exhibits a relatively high, everted, straight to out-curved rim form with simple-stamped or, to a lesser extent, check-stamped surface treatment. Simple stamping and check stamping are one of the hallmarks of later Middle Missouri tradition pottery, namely the Extended and Terminal Middle Missouri variants. Decoration on Riggs ware rims, when present, is typically restricted to the lip area and most often consists of finger impressions, tool impressions, and incised lines; thin bands of clay encircling the rim, known as fillets, are a minor decorative element. Small nodes or tabs applied to the exterior lip/rim juncture are another distinguishing characteristic of Riggs ware.

The name Riggs ware was first used by Kleinsasser (1953) in his ceramic typology for the Thomas Riggs site in South Dakota. Wood and Woolworth (1964) substantially modified and adapted Kleinsasser's typology to the ceramic collection from the Paul Brave site in North Dakota. Then, Lehmer (1966) and Wood (1967) collaborated and devised another somewhat modified typology for Riggs ware that was applicable to both Extended and Terminal Middle Missouri assemblages. With certain refinements, the Lehmer-Wood typology has enjoyed wide application and is still the basis for classificatory systems used today (e.g., Ahler and Swenson 1993; Calabrese 1972; Griffin 1984; Lee 1980; Sperry 1968, 1995; Thiessen 1995; Wood 1999). More recently, it has been suggested that Riggs ware be restricted to the ca. A.D. 1200-1400 time frame of the Extended Middle Missouri variant, based on a rather narrow redefinition of Riggs ware itself, in order to accommodate a later, newly defined ceramic ware named Stanton ware (Ahler 2001:35-38). For purposes of this study, the original, broader definition of Riggs ware is maintained and the derivative Stanton ware is not used.

According to Ahler (2001:35), Riggs ware "grades" into Stanton ware, the recently defined successor to Riggs ware in Middle-to-Late Plains Village assemblages. Stanton ware is in actuality a broadly defined ceramic group that includes diverse types of everted, straight rim and straight-braced rim

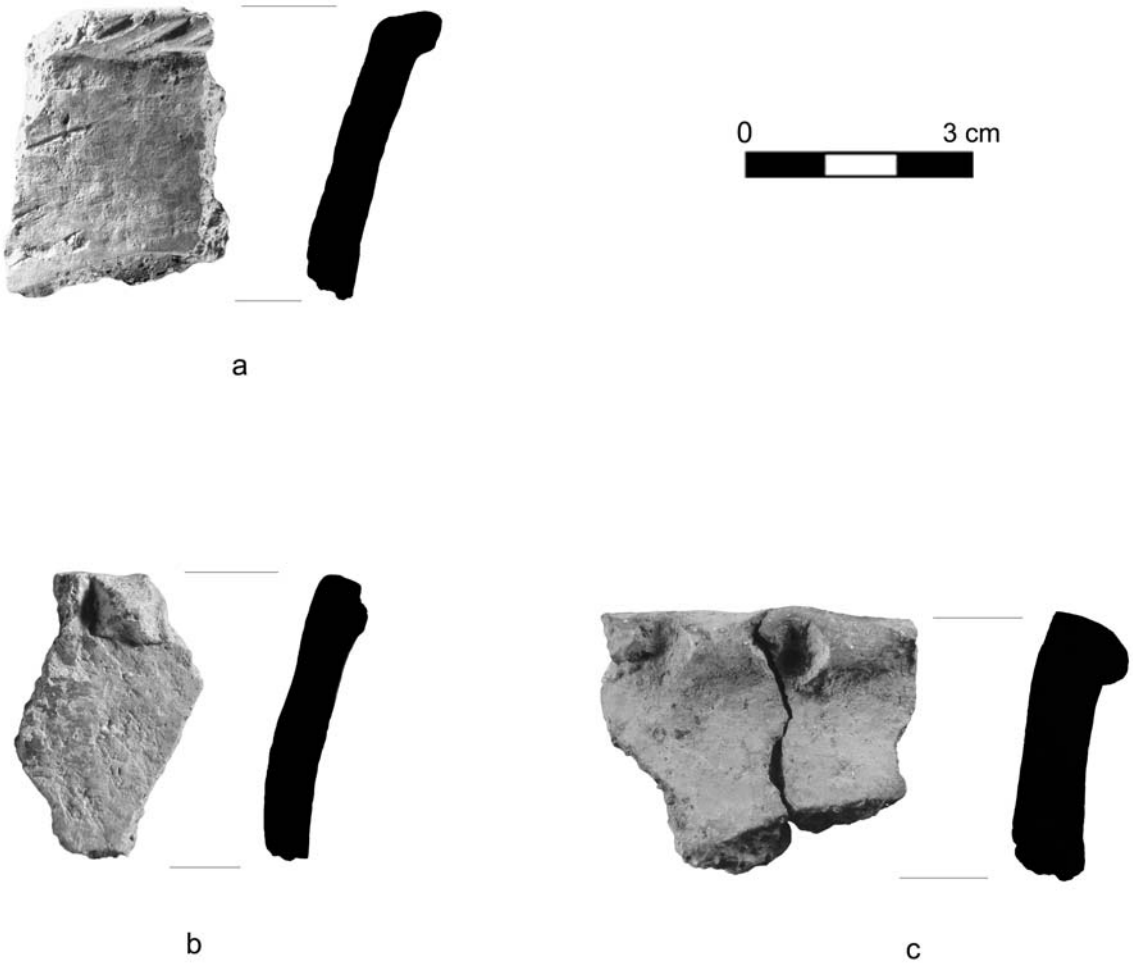

Figure 4.2. Ceramic vessel rim sherd photos, Buchanan ware and Riggs ware, Elbee site (32ME408), 2010 UND fieldwork. a: Buchanan Decorated Lip, Tool Impressed (vessel 302). b: Riggs Decorated Lip, Finger Impressed (vessel 301). c: Riggs Decorated Lip, Finger Impressed (vessel 303).

pottery (Ahler 2001:38). In Toom's opinion, Stanton ware is too eclectic to be analytically useful because it includes specimens that might otherwise be better classified as either Riggs ware or Knife River ware. Moreover, its overly broad definitive criteria tend to mix attributes, like straight, braced and unbraced rims, that were used in previous Middle Missouri ceramic studies to define separate wares, such as Riggs ware and Knife River ware (e.g., see Lehmer et al. 1978). For these reasons, Stanton ware will not be used in the present study. It can be noted, however, that the three vessels represented in the 2010 ceramic assemblage from Elbee could be classified as Stanton ware, if one were to choose to do so.

Two examples of one type of Riggs ware were identified in the Elbee ceramic sample from the 2010 excavations: Riggs Decorated Lip, subtype Finger Impressed. An outline description of the two vessels assigned to this type follows.

Riggs Decorated Lip: n=2; Vessels 301 and 303; Figure 4.2b-c.

Ware: Riggs Type: Decorated Lip Subtype: Finger Impressed
Rim form: straight.
Rim orientation: everted.
Exterior surface treatment: smoothed.
Rim decoration: plain.
Lip decoration: finger impressed.
Lip decorative motif: horizontally repetitive.
Lip form: beaded-out.
Shoulder decoration: unknown, indeterminate.
Temper: grit (crushed granite).
Paste: compact.
Color: buff.
Orifice diameter estimate: indeterminate, too small for estimate.
Appendages: none present.
Vessel rim wall thickness:
Vessel 301--maximum 6.14 mm, minimum 5.96 mm.
Vessel 303--maximum 9.70 mm, minimum 8.25 mm.
Type Reference: Lehmer (1966:29); Wood (1967:65).

The two Riggs Decorated Lip vessels are in actuality assigned to two different site components based on provenience and rim wall thickness. Vessel 301, recovered from XU5, and also the thinner of the two vessels, is assigned to the MPV-A component. Vessel 303, recovered from XU9, and the thicker of the two vessels, is assigned to the LPV-A component. An increase in vessel wall thickness as one moves from Middle period to Late period Plains Village ceramic assemblages is a fairly well documented phenomenon, and it would appear that the A terrace village at Elbee is no exception.

Stone Tools

In all, 33 stone tools and tool fragments were recovered from the 2010 Elbee excavations. Coding of the tools resulted in a new total of 35 functional occurrences because two tools were double function specimens, with each tool use coded and counted as a separate tool. The 33 stone tools represent seven different descriptive categories (Table 4.9). The most numerous of these were unpatterned flake tools (DC29), unpatterned ground/pecked stone tools (DC34), end scrapers (DC15), and triangular and lanceolate bifaces (DC01).

Tool Technology

The 35 tools were assigned to one of eight technological classes and cross-tabulated by component analytic unit and excavation unit (Table 4.10). Unpatterned flake tools (TC05), patterned small thin bifaces (TC01), patterned flake tools (TC04), and unpatterned pecked/ground stone tools (TC09) were the most common specimens. No unpatterned thick bifacial cores/tools (TC06), unpatterned

Table 4.9. Stone Tool Descriptive Category Data for the Elbee Site (32ME408), 2010 UND Fieldwork.

DC Code	Descriptive Category	Count	%
01	Triangular and lanceolate bifaces, complete and incomplete	4	12.1
09	Patterned biface fragments	2	6.1
14	Unpatterned bifaces and nonbipolar core tools and core tools, complete and incomplete	1	3.0
15	End scrapers, complete and incomplete	4	12.1
29	Unpatterned flake tools	15	45.4
30	Bipolar cores and tools	2	6.1
34	Unpatterned ground/pecked stone tools	5	15.2
Total		**33**	**100.0**

nonbipolar cores/tools (TC07), or patterned ground stone tools (TC10) were present in the assemblage. The by far highest numbers of tools came from XU5 in association with the MPV-A component. XU9 and the LPV-A component are at a distant second in terms of numbers of tools, but a nice example of a patterned large thin biface was recovered from this unit. Other units produced only one or two stone tools each. Two large unpatterned pecked/ground/cobble tools (TC09) were recovered from the riverbank opposite XU6 and are coded as from an unknown (UKN) component. The single unpatterned flake tool (TC05) from XU8 was from a provenience not coded (NCD) as to component (Table 4.10).

Technology and Lithic Raw Materials

Lithic raw material types identified in the tool assemblage are listed in Table 4.11, cross-tabulated by technological class. With one exception, all of the lithic raw materials are locally available from nearby western North Dakota sources (see Root et al. 1999). All of the chipped stone tools (TC01-08) are made of Knife River flint (KRF), with one possible exception. This comes as no surprise because the Elbee site is located on the Knife River no more than about 50 km to the east of the western boundary of the Knife River flint primary source area (Root 1992:24). The exception is a patterned flake tool—actually a trapezoidal blade segment—of burned flint that is probably an English-made gunflint. The specimen was apparently manufactured by the segmented trapezoidal blade technique typical of late English gunflints of the 1700s and early 1800s (Clarke 1935; Whittaker 2001). Because the Elbee specimen is heavily burned and fractured, we could not positively determine whether it was made of exotic English flint or locally available KRF based on visual characteristics alone. However, given the obvious use of sophisticated blade technology, which is not typically seen in Plains Village lithic assemblages, we believe that the identification of the specimen as an English gunflint is probably correct.

All of the peck/ground/cobble tools (TC09) and the single fire-cracked rock (FCR) tool (TC98) are made of materials available in local glacial-fluvial gravels, including basalt, granite, natural clinker, and metaquartzite (Table 4.11).

Function and Use-Phase

Data on the functional and use-phase classification of stone tools in the Elbee assemblage are presented in Table 4.12. Selected specimens are illustrated in Figure 4.3. The 35 functional tool occurrences in the sample fall within 14 different functional classes, which are collapsed into nine functional groups. The variety of functional classes present in the sample indicates that stone tool use at the site was general rather than specialized, involving a number of different tasks.

The projectile points and weapons functional group contains four projectile points assigned to functional class 01 (FC01). All four of the specimens are use-life 2 (UL2), incomplete tools broken in manufacture. No complete, finished, and typologically classifiable projectile points were present in the

Table 4.10. Stone Tool Technological Class Data by Component Analytic Unit (CAU) and Excavation Unit, Elbee Site (32ME408), 2010 UND Fieldwork.

Unit	CTU	Technological Classes[a]								Total	%
		01	02	03	04	05	08	09	98		
XU05	MPV-A	4			4	14	1			23	65.7
%		*17.4*	*--*	*--*	*17.4*	*60.9*	*4.3*	*--*	*--*	*100.0*	
XU09	LPV-A		1	1		1	1			4	11.4
%		*--*	*25.0*	*25.0*	*--*	*25.0*	*25.0*	*--*	*--*	*100.0*	
XU06	MPV-B	1						1		2	5.7
%		*50.0*	*--*	*--*	*--*	*--*	*--*	*50.0*	*--*	*100.0*	
XU06	LPV-B							1	1	2	
XU07	LPV-B		1							1	
Subtotal		*0*	*1*	*0*	*0*	*0*	*0*	*1*	*1*	*3*	*8.6*
%		*--*	*33.3*	*--*	*--*	*--*	*--*	*33.3*	*33.3*	*99.9*	
(XU06)	UKN							2		2	5.7
%		*--*	*--*	*--*	*--*	*--*	*--*	*100.0*		*100.0*	
XU08	NCD					1				1	2.9
%		*--*	*--*	*--*	*--*	*100.0*	*--*	*--*	*--*	*100.0*	
Total		**5**	**2**	**1**	**4**	**16**	**2**	**4**	**1**	**35**	**100.0**
%		**14.3**	**5.7**	**2.9**	**11.4**	**45.7**	**5.7**	**11.4**	**2.9**	**100.0**	

[a]Technological Class Codes: (01) patterned small thin bifaces, (02) patterned large thin bifaces, (03) unpatterned irregular bifaces, (04) patterned flake tools, (05) unpatterned flake tools, (08) unpatterned bipolar cores/tools, (09) unpatterned pecked/ground/cobble tools, and (98) fire-cracked rock tools.

Table 4.11. Stone Tool Raw Material Data by Technological Class, Elbee Site (32ME408), 2003 UND Fieldwork.

Code	Lithic Raw Material Type	Technological Classes[a]								Total	%
		01	02	03	04	05	08	09	98		
Western North Dakota Group											
13	Basalt							1		1	2.9
19	Granite							1	1	2	5.7
23	Clinker							1		1	2.9
28	Knife River flint	5	2	1	4	15	2			29	82.9
35	Metaquartzite							1		1	2.9
European Imports											
32	English flint (probable)					1				1	2.9
Total		**5**	**2**	**1**	**4**	**16**	**2**	**4**	**1**	**35**	**100.2**
%		**14.3**	**5.7**	**2.9**	**11.4**	**45.7**	**5.7**	**11.4**	**2.9**	**100.0**	

[a]Technological Class Codes: (01) patterned small thin bifaces, (02) patterned large thin bifaces, (03) unpatterned irregular bifaces, (04) patterned flake tools, (05) unpatterned flake tools, (06) unpatterned thick bifacial cores/tools, (07) unpatterned nonbipolar cores/tools, (08) unpatterned bipolar cores/tools, (09) unpatterned pecked/ground/cobble tools, and (98) fire-cracked rock tools.

Table 4.12. Stone Tool Functional Class Data by Use-Life for the Elbee Site (32ME408), 2010 UND Fieldwork.

General Functional Group			Use-Life				Total	%
	Specific Functional Class		1	2	3	4		
01	Projectile Points, Weapons							
	01	Projectile points		4			4	11.4
	43	Gunflints				1	1	2.9
02	Knives							
	07	Bilateral cutting tools used on soft materials, long duration				1	1	2.9
	15	Bifacial cutting tools, not further specified		1			1	2.9
03	Indeterminate Knives or Projectile Points							
		(none)						
04	Hide Working Tools							
	06	Light duty transverse scrapers used on soft materials				2	2	5.7
	20	Transverse scraping tools, not further specified		1		1	2	5.7
05	Light-Duty Bone, Antler, Woodworking Tools							
	17	Scrapers used on hard materials			1		1	2.9
	22	Utilized or retouched flakes used on moderately resistant materials				11	11	31.4
06	Heavy-Duty Woodworking Tools							
		(none)						
07	Stone Working Tools							
		(none)						
08	Flake Tools and Expedient Cutting Tools							
	08	Expedient cutting tools				1	1	2.9
	23	Retouched or utilized flakes used on soft materials				4	4	11.4
09	Grooving, Incising Tools							
		(none)						
10	Heavy-Duty Core Tools							
	27	Heavy-duty scraping or adzing tools			1		1	2.9
11	Cores and Tested Cobbles							
	21	Cores				2	2	5.7
12	Grinding Tools							
	33	Flat and convex abrading stones				1	1	2.9
13	Hammerstones, Anvils							
	29	Hammerstones			2	1	3	8.6
14	Ornaments, Nonutilitarian Items							
		(none)						
15	Practice Pieces							
		(none)						
16	Miscellaneous, Other Items							
		(none)						
Total			**0**	**6**	**4**	**25**	**35**	**100.2**
%			**--**	**17.1**	**11.4**	**71.4**	**99.9**	

sample. However, all of the unfinished projectile points are small, thin, pressure flaked arrow point forms (Figure 4.3a-c). Also in this tool group is the probable English gunflint (FC43) discussed above under technology and raw materials (Figure 4.3d). Because of its poor condition (heavily burned and fractured), a definitive identification could not be made of this specimen. However, based on its remaining observable attributes—manufacture by blade technology with step-flaked and crushed-edge use-wear—we believe that the English gunflint interpretation is accurate. The gunflint was recovered from XU5, Level 2, indicating that some material in this MPV-A component unit actually relates to the LPV-A component at Elbee.

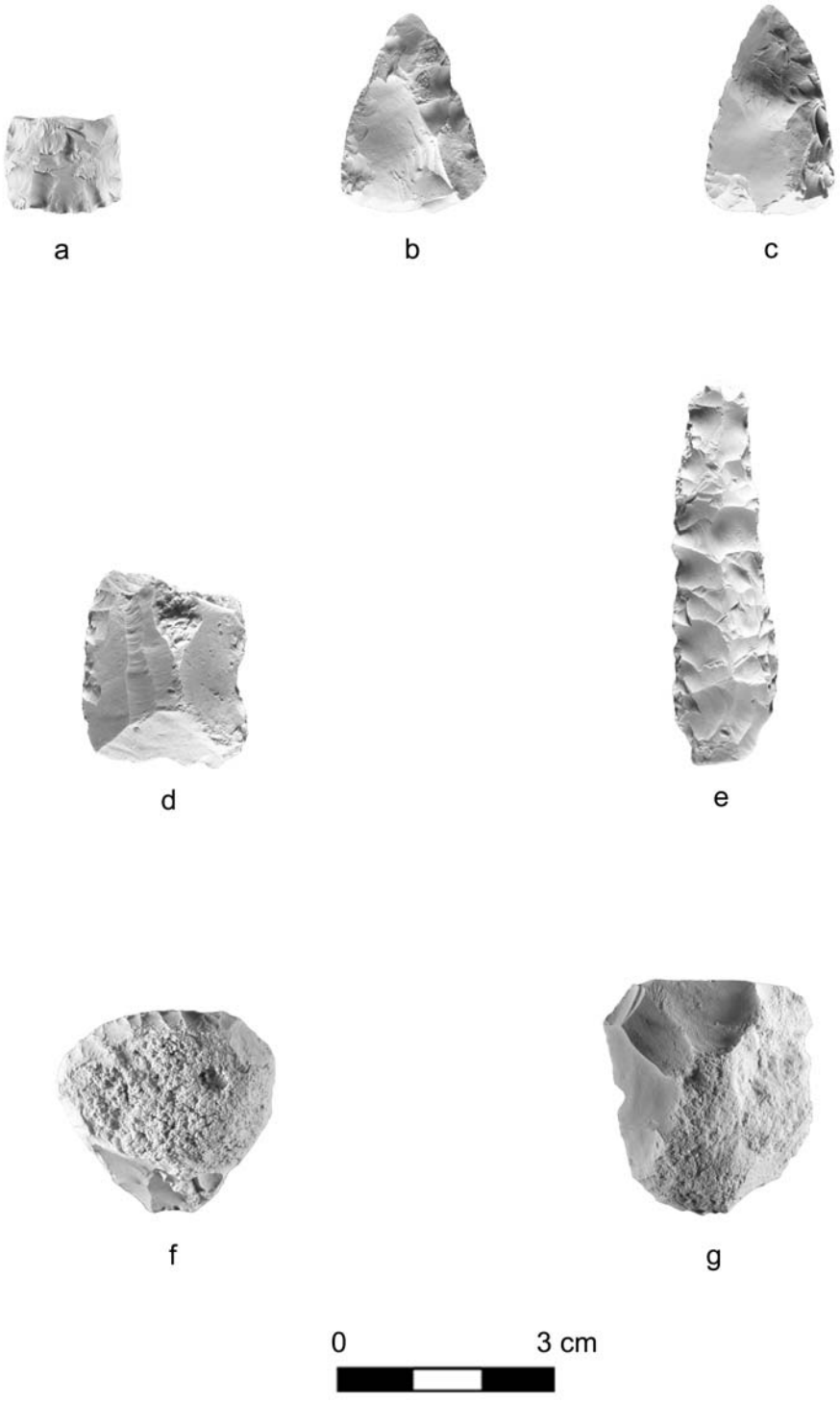

Figure 4.3. Stone tool photos, Elbee site (32ME408), 2010 UND fieldwork. a-c: Arrow point performs (cpno 010301, 010302, 010303). d: English gunflint (cpno 150304). e: Bilateral cutting tool (cpno 010304). f-g: Transverse scraping tools (cpno 150302, 150303). Note: artifacts have been smoked with ammonium chloride.

Two tools were assigned to the knives functional group (Table 4.12). The most complete specimen was a rather nice FC07 tool: a bilateral cutting tool used on soft materials for long duration (Figure 4.3e). This tool had a transverse, proximal blade break and its remaining blade was quite narrow, indicating it was nearly exhausted from resharpening (UL4). The tool in the knife group was a small bifacial edge fragment assigned to FC15: bifacial cutting tools not further specifiable as to function.

Four tools are in the hide working tools group, all transverse (end) scrapers (Figure 4.3f-g). Two of these were transverse scrapers used on soft materials (FC06) and two were missing working elements and could not be further specified as to function (FC20).

Light-duty bone, antler, or woodworking tools were the most numerous functional group, consisting of 12 tools in two functional classes. Utilized or retouched flakes used on harder materials (FC22) were especially numerous, accounting for 11 of the 12 tools in the group. The only other tool in this group was a transverse scraper used on hard materials (FC17).

The flake tool and expedient cutting tool group was also well represented, including five tools in two functional classes. Four of the five tools were retouched or utilized flakes used on softer materials (FC23). The other tool in this group was an expedient cutting tool (FC08).

The assemblage contained one heavy-duty core tool, coded as a heavy-duty scraping adzing tool (FC27). This particular tool was a FCR tool with a heavily utilized scraping edge. The cores and tested cobbles group contained only two specimens, both cores used for flake production (FC21), and both fragments of bipolar cores.

One grinding tool was identified in the assemblage. It consisted of a small fragment of a flat and convex abrading stone (FC33) made of natural clinker (a clinker abrading tool). Such implements were used to smooth and finish the surfaces of other items. Three hammerstones or anvils (pounding tools) were identified in the collection. The two largest specimens, both hammerstones (FC29), were found on the lower riverbank in the general vicinity of XU6 (Figure 4.4a). They cannot therefore be assigned with any confidence to either the LPV-B or the MPV-B components. The other specimen, a small hammerstone (FC29), was recovered from XU6 in association with the LPV-B component (Figure 4.4b). Fine pitting wear on this tool made it look as though it had been used to repeatedly strike a small-diameter, pointed object.

Flake Debris

Flake debris is the byproduct of chipped stone tool manufacture. It is often recovered from prehistoric archeological sites in large numbers. The A terrace units at Elbee produced modest numbers of flakes, but the B terrace units yielded almost none. This is most unusual because late prehistoric age archeological deposits are typically noted for their flake debris content.

Nearly all of the flake debris in the 2010 Elbee collection came from the two A terrace area units, especially XU6; the three B terrace units are conspicuous by the near absence of flake debris (Table 4.13). XU6 produced 85.5% of the flake debris by count from a MPV-A context. XU9 produced another 11.8% of the flake debris from a LPV-A context. It is possible that the lower number of flakes from XU9, relative to XU6, is a reflection of the decline in traditional native lithic technology one sees during Late Plains Village times (Post-Contact Coalescent variant; see Toom 1979). Only one flake each was recovered from LPV-B contexts in XU6, XU7, and XU8, which also might be explained by this phenomenon. However, it does not explain the fact that only two flakes, one G3- and the other G4-sized, were recovered from MPV-B levels in XU6 (Table 4.13).

Lithic Raw Materials

Eight lithic raw material types are identified in the aggregate sample of flake debris from Elbee, including two pertaining to unburned and burned Knife River flint (Table 4.14). Positive identification of KRF when it has been burned can be problematic, so it is sometimes best to separate burned from

Figure 4.4. Stone tool photos, Elbee site (32ME408), 2010 UND fieldwork. a: Large hammerstone (cpno 340302). b: Small hammerstone (cpno 340303).

Table 4.13. Flake Debris Size Grade Data by Component Analytic Unit (CAU) and Excavation Unit, Elbee Site (32ME408), 2010 UND Fieldwork.

Unit	CAU	Flake Debris Count[a]						Flake Debris Weight[a] (g)					
		G1	G2	G3	G4	Total	%	G1	G2	G3	G4	Total	%
XU5	MPV-A	0	10	178	0	188	85.5	0.0	33.2	74.2	0.0	107.4	86.3
	%	*0.0*	*5.3*	*94.7*	*0.0*	*100.0*		*0.0*	*30.9*	*69.1*	*0.0*	*100.0*	
XU9	LPV-A	0	0	26	0	26	11.8	0.0	0.0	13.8	0.0	13.8	11.1
	%	*0.0*	*0.0*	*100.0*	*0.0*	*100.0*		*0.0*	*0.0*	*100.0*	*0.0*	*100.0*	
XU6	MPV-B	0	0	1	1	2	0.9	0.0	0.0	2.1	0.1	2.2	1.8
	%	*0.0*	*0.0*	*50.0*	*50.0*	*100.0*		*0.0*	*0.0*	*95.5*	*4.5*	*100.0*	
XU6	LPV-B	0	0	1	0	1	0.5	0.0	0.0	0.2	0.0	0.2	0.2
XU7	LPV-B	0	0	1	0	1	0.5	0.0	0.0	0.5	0.0	0.5	0.4
XU8	LPV-B	0	0	1	0	1	0.5	0.0	0.0	0.1	0.0	0.1	0.1
	Subtotal	*0*	*0*	*3*	*0*	*3*	*1.5*	*0.0*	*0.0*	*0.8*	*0.0*	*0.8*	*0.7*
	%	*0.0*	*0.0*	*100.0*	*0.0*	*100.0*		*0.0*	*0.0*	*100.0*	*0.0*	*100.0*	
XU6	NCD[b]	0	0	1	0	1	0.5	0.0	0.0	0.3	0.0	0.3	0.2
	%	*0.0*	*0.0*	*100.0*	*0.0*	*100.0*	*1.0*	*0.0*	*0.0*	*100.0*	*0.0*	*100.0*	
Total		**0**	**10**	**209**	**1**	**220**	**100.2**	**0.0**	**33.2**	**91.2**	**0.1**	**124.5**	**100.1**
%		**0.0**	**4.5**	**95.0**	**0.5**	**100.0**		**0.0**	**26.7**	**73.3**	**0.1**	**100.1**	

[a]Size grade specifications (G1, G2, G3, G4) can be found on page 2.3.
[b]NCD: not coded.

Table 4.14. Flake Debris Lithic Raw Material Type Data by Size Grade, Elbee Site (32ME408), 2010 UND Fieldwork. Size grade specifications (G1, G2, G3, G4) can be found on page 2.3.

Code	Lithic Raw Material Type	G1	G2	G3	G4	Total	%
Western North Dakota Group							
04	Orthoquartzite (unspecified)	0	0	1	0	1	0.5
08	Clear/gray chalcedony	0	0	7	0	7	3.2
09	Yellow/light brown chalcedony	0	0	2	0	2	0.9
16	Quartz	0	0	1	0	1	0.5
17	Porcellanite	0	0	2	0	2	0.9
28	Knife River flint	0	7	149	1	157	71.4
39	Burned Knife River flint	0	3	46	0	49	22.3
51	Miocene (Sentinel Butte) chert	0	0	1	0	1	0.5
Total		**0**	**10**	**209**	**1**	**220**	**100.2**
%		**--**	**4.5**	**95.0**	**0.5**	**100.0**	

unburned material until we are sure of its identification. Without exception, all eight of the identified Elbee raw materials are locally available materials found in western North Dakota. Combined burned and unburned Knife River flint (KRF) wholly dominates the sample at 93.7%, just as it did in the stone tool sample. The percentage of burned KRF is rather high at 22.3% of the aggregate sample, as one might expect in a village setting.

Fire-Cracked Rock

Fire-cracked rock (FCR) is the byproduct of the use of heated stones for cooking and other purposes, such as steam generation for sweat baths. A mere total of 118 pieces of G1-3 FCR was recovered from the Elbee excavations, weighing a total of only 566.6 g (Table 4.15). The FCR size grade data clearly illustrate the inverse relationship between the number (count) and weight of specimens among the three size grades. The four pieces of G1 FCR account for only 3.4% of the total number of pieces in the collection, but they comprise 68.3% of the total sample weight. Conversely, the 102 pieces of G3 FCR make up 86.4% of the total number, but contribute only 12.3% to the total weight. Obviously, a few pieces of G1 FCR can make up a much more substantial mass of material than will many pieces of G3 or even G2 FCR. Therefore, weight is seen as a better quantitative variable in the interpretation of FCR than is the number of pieces.

According to weight, most FCR in the Elbee collection (44.8%) was recovered from the LPV-B levels in XU7 (Table 4.15). Still, in terms of numbers, only nine pieces of FCR are represented, with 2 G1-sized pieces accounting for 83.9% of the weight. Seven pieces of FCR from MPV-B levels in XU6, in association with the F201 hearth, produced another 20.9% of the aggregate sample weight, with a single G1 specimen accounting for 90.9% of the weight. FCR was not an especially numerous artifact material in the 2003 Elbee collection, and it is even less abundant in the 2010 collection. These findings likely indicate that cooking with heated stones was not a common activity at the site. Moreover, the paucity of FCR in association with the F201 hearth indicates that it was probably not a cooking feature, or at least not a cooking feature that employed quantities of heated stones, like an earth oven. We also can rule out a sweat lodge feature, which would have contained copious amounts of FCR.

Table 4.15. Fire-Cracked Rock Size Grade Data by Component Analytic Unit (CAU) and Excavation Unit, Elbee Site (32ME408), 2010 UND Fieldwork.

Unit	CAU	Fire-Cracked Rock Count[a]					Fire-Cracked Rock Weight[a] (g)				
		G1	G2	G3	Total	%	G1	G2	G3	Total	%
XU5	MPV-A	0	9	68	77	65.3	0.0	68.6	45.8	114.4	20.2
%		*0.0*	*11.7*	*88.3*	*100.0*		*0.0*	*60.0*	*40.0*	*100.0*	
XU9	LPV-A	1	0	22	23	19.5	66.1	0.0	12.1	78.2	13.8
%		*4.3*	*0.0*	*95.7*	*100.0*		*84.5*	*0.0*	*15.5*	*100.0*	
XU6	MPV-B	1	1	5	7	5.9	107.8	4.1	6.7	118.6	20.9
%		*14.3*	*14.3*	*71.4*	*100.0*		*90.9*	*3.5*	*5.6*	*100.0*	
XU7	LPV-B	2	2	5	9	7.6	213.0	37.3	3.6	253.9	44.8
%		*22.2*	*22.2*	*55.6*	*100.0*		*83.9*	*14.7*	*1.4*	*100.0*	
XU7	NCD[b]	0	0	1	1	0.8	0.0	0.0	1.2	1.2	0.2
XU8	NCD	0	0	1	1	0.8	0.0	0.0	0.3	0.3	0.1
Subtotal		*0*	*0*	*2*	*2*	*1.3*	*0.0*	*0.0*	*1.5*	*1.5*	*0.3*
%		*--*	*--*	*100.0*	*100.0*		*--*	*--*	*100.0*	*100.0*	
Total		**4**	**12**	**102**	**118**	**99.9**	**386.9**	**110.0**	**69.7**	**566.6**	**100.0**
%		**3.4**	**10.2**	**86.4**	**100.0**		**68.3**	**19.4**	**12.3**	**100.0**	

[a]Size grade specifications (G1, G2, G3) can be found on page 2.3.
[b]NCD: not coded.

Vertebrate Faunal Remains

Less than one kilogram (514.9 g; n=420) of G1-3 animal bone was recovered from the 2010 excavations at the Elbee site (Table 4.16). Nearly three-quarters of the bone aggregate (72.7%; 374.1 g) was recovered from XU9, most of which derives from a single specimen taken from the F202 posthole: the parts of a broken bison scapula hoe. Lesser amounts of bone were recovered from XU6 (98.3 g; n=219), XU5 (21.6 g; n=61), XU7 (19.0 g; n=26), and XU8 (1.9 g; n=2). By size grade weight, there are 305.8 g of G1 bone (59.4%; n=2), 53.9 g of G2 bone (10.5%; n=14), and 155.9 g of G3 bone (30.3%; n=404). Roughly three-fourths of the bone, by weight, was recovered from LPV-A component levels in XU9. In addition, one G1 specimen from XU9 (in F202), a broken bison scapula hoe, accounts for nearly 80% of the bone, by weight, recovered from XU9, and nearly 57% of the aggregate bone sample weight (Table 4.16). These simple facts point to the overall paucity of bone of any size in the 2010 collection from Elbee.

A number of small bone fragments (7 G2 and 159 G3) were recovered from the bottom levels of XU6 in association with the MPV-B component and the F201 hearth (Table 4.16). While hardly conclusive, the presence of fragmented bone in this context does suggest that food preparation might have been one activity performed at the hearth.

Generally speaking, the recovered bone was highly fragmented, with each bone piece weighing 1.22 g on average. Such extensive breakage is mainly attributed to crushing and pounding of animal bone for boiling and grease production (see Vehik 1977).

Included in the total bone aggregate are nine G1-3 pieces that are identifiable as to species, and an additional 11 G4-5 potentially identifiable pieces (Table 4.16). The aggregate sample contains only two G1-3 modified bone specimens (i.e., bone tools or ornaments), one of which is also identifiable as to species. Additional analyses were carried out on these artifacts.

Identifiable Bone

The collection contains 20 G1-4 pieces of identifiable bone elements, consisting of nine larger-sized specimens (G1-3 pieces) and 11 small specimens (G4 pieces). One of the modified bone specimens (a broken scapula hoe) is also identifiable as to species, bringing the total number of analyzed specimens to 21 (Table 4.16). Most of the identifiable bone was found in XU9 (n=17) in association with the LPV-A component. The G4 identifiable specimens were analyzed, despite the fact that most if not all are ecofacts likely unrelated to the archeological deposit. If some of these small specimens are, in fact, archeological in origin, then they were from relatively small animals that would not have made a significant contribution to the diet of the inhabitants of the site.

The following description and analysis of G1-3 identifiable specimens is organized according to body size categories. This is useful because very large and large animals would have had higher food values than medium and small animals. Food value, as used here, is a relative measure of the amount of calories received through consumption compared to the amount of calories expended in procurement and processing tasks. Very large and large animals have the highest food values, because they returned the most meat for the same amount of energy expended in hunting and processing tasks, in theory (c.f., Simms 1987). The very large and large animals were also important resources for raw materials used to make clothing, tools and shelter. In contrast, medium and small animals would have been much less important in terms of caloric yield and their utility as raw material resources.

Taxonomic faunal identifications were made with reference to the UND Anthropology comparative faunal collection and various faunal identification guides (Balkwill and Cumbaa 1992; Brown and Gustafson 1979; Gilbert 1973, 1990; Glass 1973; Olsen 1960, 1964, 1968, 1979). Genus and species level identifications were preferred, however, the fragmented identifiable bones in the collection often necessitated more general, higher-level taxonomic identifications.

Table 4.16. Bone Size Grade Data by Component Analytic Unit (CAU) and Excavation Unit, Elbee Site (32ME408), 2010 UND Fieldwork.

Unit	CAU	Aggregate Bone Count[a]					Aggregate Bone Weight[a] (g)					Identifiable Bone[a]		Mod. Bone[a]
		G1	G2	G3	Total	%	G1	G2	G3	Total	%	G1-3	G4-5	G1-5
XU5	MPV-A	0	0	61	61	14.5	0.0	0.0	21.6	21.6	4.2	1	0	0
%		*0.0*	*0.0*	*100.0*	*100.0*		*0.0*	*0.0*	*100.0*	*100.0*				
XU9	LPV-A	1	5	106	112	26.7	296.5	34.0	44.1	374.6	72.7	5	11	1
%		*0.9*	*4.5*	*94.6*	*100.0*		*79.2*	*9.1*	*11.8*	*100.1*				
XU6	MPV-B	0	7	159	166	39.5	0.0	16.9	62.4	79.3	15.4	0	0	0
XU8	MPV-B	0	0	1	1	0.2	0.0	0.0	1.2	1.2	0.2	0	0	0
Subtotal		*0*	*7*	*160*	*167*	*39.7*	*0.0*	*16.9*	*63.6*	*80.5*	*15.6*	*0*	*0*	*0*
%		*0.0*	*4.2*	*95.8*	*100.0*		*0.0*	*21.0*	*79.0*	*100.0*				
XU6	LPV-B	0	0	45	45	10.7	0.0	0.0	15.4	15.4	3.0	0	0	0
XU7	LPV-B	0	2	23	25	6.0	0.0	2.8	6.9	9.7	1.9	3	0	0
XU8	LPV-B	0	0	1	1	0.2	0.0	0.0	0.7	0.7	0.1	0	0	0
Subtotal		*0*	*2*	*69*	*71*	*16.9*	*0.0*	*2.8*	*23.0*	*25.8*	*5.0*	*3*	*0*	*0*
%		*0.0*	*2.8*	*97.2*	*100.0*		*0.0*	*10.9*	*89.1*	*100.0*				
XU6	NCD[b]	0	0	8	8	1.9	0.0	0.0	3.6	3.6	0.7	0	0	0
XU7	NCD	1	0	0	1	0.2	9.3	0.0	0.0	9.3	1.8	0	0	0
Subtotal		*1*	*0*	*8*	*9*	*2.1*	*9.3*	*0.0*	*3.6*	*12.9*	*2.5*	*0*	*0*	*0*
%		*11.1*	*0.0*	*88.9*	*100.0*		*72.1*	*0.0*	*27.9*	*100.0*				
Total		**2**	**14**	**404**	**420**	**99.9**	**305.8**	**53.7**	**155.9**	**515.4**	**100.0**	**9**	**11**	**1**
%		**0.5**	**3.3**	**96.2**	**100.0**		**59.3**	**10.4**	**30.2**	**99.9**				

[a]Size grade specifications (G1, G2, G3, G4, G5) can be found on page 2.3.
[b]NCD: not coded.

Table 4.17. Identified Bone from the Elbee Site (32ME408), 2010 UND Fieldwork.

Common Name	Taxonomic Name	NISP [a]	NISP %	MNI [b]
Very Large Animal (bison, elk, grizzly bear, etc.)				
American Bison [c]	*Bison bison*	2	9.5	1
Large Animal (deer, wolf, black bear, etc.)				
Likely Pronghorn Antelope	*Antelocapra americanus?*	1	4.8	1
Medium Animal (coyote, raccoon, large birds, etc.)				
(none)		0	0	--
Small Animal (mice, small birds, squirrels, snakes, turtles, etc.)				
Voles	*Microtus* sp.	2	9.5	1
Small Birds	Aves (small)	3	14.3	n/a
Small Rodents	Rodentia	13	61.9	n/a
Total		**21**	**100.0**	**--**

[a] Number of Identified Specimens.
[b] Minimum Number of Individuals. This is calculated only for genus level taxons.
[c] One identifiable bison element is a modified bone tool (scapula hoe).

Very Large Animals. There are two elements in the very large animals body size category (Table 4.17). This category includes species with adult males that weigh in excess of 225 kg. At Elbee, this group is populated solely by bison elements. The Number of Identified Specimens (NISP) for American bison (*Bison bison*) is two (9.5%) and the Minimum Number of Individuals (MNI) is one. Identified bison elements include a scapula (fragmented hoe tool) and a distal condyle fragment off a medapodial.

Large Animals. One element (4.8%) comprises the large animal body size category (Table 4.17). Included in this group are species where the adult male weighs between 27-225 kg. The bone piece is provisionally identified as pronghorn antelope (*Antelocapra americana*?). It is a second phalange that is complete and notably weathered. It is roughly pronghorn-sized, although it could also be from a small deer. It is too small and gracile, however, to have been from an immature bison or elk.

Small Animals. Eighteen elements comprise the small animal body size category (Table 4.17). This category includes species with adult males that weigh less than 2 kg. It is unlikely that any of these elements reflect human predation and consumption. Thirteen elements (61.9%) are from one or more small rodents (Order Rodentia), most likely a mouse or gopher. Two teeth elements (9.8%) were identified as vole (*Microtus* sp.), and three elements (14.3%) were identified as small birds (Class Aves).

Discussion. The bison and pronghorn elements indicate human predation and consumption; the heavily broken, unidentifiable bone fragments also are the product of food procurement and processing. The bison scapula hoe also reflects the use of bones from this animal as raw material for tool production. The remaining bird, vole, and rodent elements are all likely ecofacts, which were probably added to the archeological deposit through natural processes and would be unrelated to the human occupations of the site area.

Modified Bone

Modified bone, as the term is used here, consists of animal bone elements that have been modified into recognizable tools or ornaments or fragments thereof. Pieces of two modified bone artifacts were recovered from the Elbee site in 2010. The largest and most complete specimen was a broken bison scapula hoe (Figure 4.5). The specimen was originally recovered as five pieces, but it now consists of four pieces in the site collection because one of the smaller blade fragments was sacrificed as sample material for the OS-85872 radiocarbon date. The hoe pieces were found in XU9, placed vertically in the F202 posthole (see Figure 3.8). It is thought that the hoe fragments had been used as a post wedge after the hoe was broken. The remaining hoe pieces weigh 296.5 g, comprising over half the total bone aggregate (57.6%) in the collection. The dorsal spine had been removed from the scapula to prepare it for use as a hoe. There was also evidence that the blade of the scapula had been marginally trimmed, possibly with a heavy metal tool. Metal tool modification is a distinct possibility because the OS-85872 radiocarbon date dates the specimen to around the late A.D. 1700s, within the Late Plains Village (post-contact) period. Smaller, remaining pieces of the blade proper show signs of use-wear indicative of a digging tool, including polish and a beveled distal working edge.

The second modified bone specimen is a small G3 fragment of slightly burned and polished bone. It was recovered from general level fill in XU9, Level 3, a LPV-A context. The specimen has no modified edges and appears to be a fragment of small-sized long bone. The outer, curved surface of the fragment is polished and exhibits a series of fine parallel striations.

Other Artifacts and Materials

Other artifacts and materials present in the Elbee collection include shell, natural clinker, burned earth, fired clay, wood charcoal, and modern European American (EA) artifacts (Table 4.18). Each of these material classes is discussed in the paragraphs that follow. No consolidated and recoverable ash deposits were present in the excavations. Likewise, no historic Native American artifacts were recovered from the site, except for the one probable English gunflint discussed previously under stone tools. Such a specimen, likely of European origin, would have been a trade good used for purposes of exchange in the early fur trade of the Northern Plains (e.g., see Wood and Thiessen 1985).

Shell

The aggregate shell (invertebrate fauna) sample consists of a mere 15 G1-3 pieces weighing a total of only 8.1 g (Table 4.18). The shell is mostly small (G3) fragments from the valves of freshwater mussels (bivalves), except for the two identifiable specimens, which are small (G3) univalve (snail) shells, and one G2-sized piece of modified and identifiable mussel shell. This is a rather small amount of shell, comprising a minor artifact class. Certain species of freshwater mussels live in the Knife and Missouri rivers (Cvancara 1983), which were undoubtedly the source of the mussel shell at Elbee.

Modified shell, for purposes of this report, includes those specimens that were made into recognizable tools or ornaments, or are the debris from tool or ornament manufacture. The single modified specimen in the 2010 Elbee collection is a larger (G2) piece of mussel shell with the hinge area intact. The piece exhibits straight-line breaks with smooth edges in places, suggesting it could represent manufacturing debris.

Natural Clinker

Clinker is a very porous, lightweight stone of coal-burn origin that occurs naturally in western North Dakota (Root et al. 1999). Resembling pumice, clinker was commonly used as an abrading tool material. Three pieces of natural clinker are present in the Elbee collection, including one G2 specimen and two G3 specimens (Table 4.18). This material is thought to be debris from the manufacture and use of clinker abrading tools at the site. Alternatively, clinker is light enough to float in water, so the material could have been naturally deposited in the site by over-bank flows of the Knife River.

Figure 4.5. Bone tool photos, Elbee site (32ME408), 2010 UND fieldwork. a: Bison scapula hoe, broken proximal element, distal working end missing (fcn 2116). Note: specimen is at 75% of actual size.

Table 4.18. Miscellaneous Material Classes by Component Analytic Unit (CAU) and Excavation Unit, Elbee Site (32ME408), 2010 UND Fieldwork.

Exc. Unit	CAU	Total Shell	Total Shell	ID Shell	Modified Shell	Natural Clinker	Burned Earth	Fired Clay	Ash	Wood/ Charcoal	NA Historic	EA Historic
		G1-3 (n)	G1-3 (g)	G1-3 (n)	G1-5 (n)	G1-3 (n)	G1-3 (g)	G1-3 (g)	G1-3 (g)	G1-3 (g)	G1-5 (n)	G1-4 (n)
XU5	MPV-A	12	7.8		1		1.0	5.1			(1)[a]	58
XU9	LPV-A	1	0.1					0.4		0.2		27
XU6	MPV-B					1						
XU6	LPV-B											
XU7	LPV-B	1	0.1	1		2				0.1		
XU8	LPV-B											
Subtotal		*1*	*0.1*	*1*		*2*				*0.1*		
F201	MPV-B									13.0		
XU6	NCD											5
XU7	NCD	1	0.1	1								2
XU8	NCD											1
Subtotal		*1*	*0.1*	*1*								*8*
Total		**15**	**8.1**	**2**	**1**	**3**	**1.0**	**5.5**	**0.0**	**13.3**	**(1)[a]**	**93**

[a]A probable English gunflint, considered in detail under stone tools.

Burned Earth and Fired Clay

Burned earth and fired clay are the byproducts of the use of fire at the site. They differ only in textural grade and, perhaps, intended use. Burned earth, with its loamy texture, is the incidental byproduct of fire use at the site, such as from a hearth. Fired clay, with its finer texture, is somewhat different in this regard and may be the byproduct of ceramic manufacture or other uses of clay at the site.

Only a few small, G3-sized pieces of burned earth, weighing a mere 1.0 g, were recovered in the 2010 excavations at Elbee, all from XU5. Several small, G3-sized pieces of fired clay were recovered from XU5 and XU9, weighing a total of 5.5 g, with most (5.1 g) coming from XU5 (Table 4.18).

Ash and Wood/Charcoal

Ash and wood charcoal are also the byproducts of fire. No consolidated ash was present in the 2010 collection from Elbee. A few very small pieces of wood or wood charcoal were recovered from general level contexts in XU9 and XU7. The pieces of wood are likely modern and intrusive. The pieces of charcoal, on the other hand, are probably archeological. The largest quantity of wood charcoal by far was found in the basin of the F201 hearth. The remaining samples of F201 charcoal in the collection weigh a total of 13.0 g and consist of 11.0 g of primary sample material and 2.0 g of identification sample material (Table 4.18). Very small quantities (0.2 g each) of wood charcoal from F201 were expended as sample material for the OS-85446 and OS-85447 radiocarbon dates.

Five pieces of the F201 wood charcoal weighing a total of about 2.0 g were submitted for identification to the PaleoResearch Institute, Golden, Colorado. The specimens were identified as Salicaceae (willow family), which includes willow and cottonwood (Appendix A).

European American Historic Artifacts

Ninety-three pieces of historic artifactual material of modern European American origin are in the site collection, with most recovered from XU5 and XU9 in the A terrace area (Table 4.18). Included among these are 18 pieces of metal, 16 glass shards, six ceramic sherds, and 53 pieces of other materials. Nearly all are smaller sized pieces in the G2 and G3 size grades. All of the historic European American materials were recovered from near-surface levels in the excavations, and all are believed to relate to the twentieth century William Russell farmstead component that once occupied the southern part of the site.

All of the metal specimens are iron (ferrous metal), except for a badly mangled piece of lead or zinc. The latter material is rather hard so we think it is zinc. The iron pieces include thin sheet stock, probably from cans, nails, and wire; all are fairly rusty.

The glass shards in the collection are mostly pieces of flat window glass. A few pieces of curved bottle glass are also present. The few ceramic sherds are from a clear-glazed white ware. The other materials group consists entirely of pieces of coal clinker.

Chapter 5
KARISHTA SITE (32ME466) ANALYSIS AND FINDINGS

Artifact Distributions and Densities

Data on the distribution of major artifact classes by excavation unit (XU), level, and soil horizon association are listed in Table 5.1. At Karishta, XU1-2 was dug into the Knife River floodplain proper, and XU3-4 and XU5-6 were dug into the adjacent, higher elevation B terrace. XU1-2 produced only four modern artifacts, a G3 piece of glass and three small pieces (G3 and G4) of coal clinker. Clearly, the late prehistoric artifact scatter that defines the Karishta site does not extend onto the Knife River floodplain.

XU3-4 produced the most artifacts, including three native ceramic sherds, one stone tool, five flakes, four pieces of fire-cracked rock (FCR), and 54 pieces of animal bone (Table 5.1). This total of 67 specimens from major prehistoric artifact classes calculates to an average density of 33.5 artifacts per square meter (m^2) of excavated area (67/2 m^2), hardly an impressive number. XU5-6 yielded even fewer artifacts, consisting only of one flake and nine animal bone fragments, for a total of only 10 specimens and a density of a mere 5.0 artifacts per m^2 (10/2 m^2). While we can identify a late prehistoric artifact deposit within the confines of the Karishta site, as originally defined, it is a very low-density deposit based on the testing data at hand.

The vertical distribution of artifacts from XU3-4 indicates that the archeological deposit at Karishta is associated with the surficial A/BC horizon (Table 5.1). The data from XU5-6 are less clear in this regard because of the paucity of recovered artifacts. Still, we can conclude that the Karishta site contains a low-density, near-surface artifact deposit, one generally found within 50 cm of the site surface, as suggested by the original site survey findings. This deposit is restricted to the B terrace area and does not appear to extend onto the adjacent, lower elevation Knife River floodplain.

Archeological Components and Analytic Units

Temporal-cultural diagnostic artifacts and stratigraphic positioning were used to determine the component makeup of the 2010 excavations conducted at the Karishta site. The observations made on diagnostic artifacts in this section are for purposes of analytic unit definition only and are more fully supported later in the respective analytical sections. No radiocarbon dates were run on any Karishta materials, so an age estimate for the deposit must rest on cross dating of ceramic attributes.

Diagnostic Artifacts

No typologically classifiable projectile points were recovered from the test excavations, but the lone stone tool recovered from the site, an arrow point tip, does reveal evidence of arrow point technology. Arrow point technology is minimally indicative of Late Prehistoric period occupations in the Northern Plains.

No native ceramic rim sherds were recovered from Karishta. The ceramic sample is limited to three small (G3) body sherds, one of which was split and could not be measured for thickness. Surface treatment for two of the sherds was smoothed and third was simple-stamped. One of the smoothed sherds exhibited signs of secondary surface treatment in the form of possible brushing, and the other had cord-impressed decoration. One of the measurable sherds was fairly thin, with a maximum thickness of 4.30 mm, while the other was moderately thick with a maximum thickness of 6.31 mm. Taken together, such ceramic attributes suggest at Late Plains Village component, although the sample is hardly large enough to be definitive. Therefore, a Middle Plains Village component cannot be entirely ruled out based on the available evidence.

Table 5.1. Summary Artifact Data by Excavation Unit, Level, and Soil Horizon Association for the Karishta Site (32ME466), 2010 UND Fieldwork. XU1-2 was dug into the Knife River floodplain; XU3-4 and XU5-6 were dug into the B terrace. Size grade specifications (G1, G2, G3, G4, G5) can be found on page 2.3.

XU	Square	Level	Soil Horizon	G1-3 Native Ceramics (n)	G1-4 Stone Tools (n)	G1-3 Flake Debris (n)	G1-3 Fire-Cracked Rock Debris (n)	G1-3 Animal Bone Debris (n)	Total (n)
XU1-2	01-02	1	A						
		2	A-AC						
		3	AC-A/C						
		4	A/C						
			Subtotal						
XU3-4	03-04	1	A-Bw			1		1	2
		2	Bw						
		3	Bw-A/BC			1	1	10	12
		4	A/BC	2		1	3	17	23
		5	A/BC-Bk	1	1	2		26	30
			Subtotal	*3*	*1*	*5*	*4*	*54*	*67*
XU5-6	05-06	1	Ap					6	6
		2	Ap-Bw						
		3	Bw			[a]1		3	4
		4	A/BC						
			Subtotal			*[a]1*		*9*	*10*
			Total	**3**	**1**	**6**	**4**	**63**	**77**

[a]The single flake from XU5-6, Level 3, was G4 size grade (<G3).

Analytic Unit Definition

A single analytic unit is reflected in the 2010 Karishta excavations: Late Plains Village-B terrace component (LPV-B). This component is believed to be essentially the same as that identified in the far northern part of the Elbee site, also on the B terrace. However, additional excavations at Karishta would be needed to confirm such a conclusion given the paucity of artifacts from the Karishta excavations, as well as the low artifact return from the Elbee excavations on the B terrace area.

The LPV-B component represents an ephemeral occupation that did not produce much in the way of artifacts and, as a consequence, is difficult to interpret. Given its lateral extent, apparently covering all or at least most of the B terrace areas of both the Elbee and Karishta sites, it may have functioned as some kind of short-term campsite or activity area occupation. No radiocarbon dates pertain to the LPV-B component itself. However, it is possible that it dates to the same late A.D. 1700s time frame as the LPV-A component at Elbee.

Native Ceramics

Native ceramic sherds recovered from the 2010 excavations at the Elbee site total only three G3 body sherds, weighing a total of a mere 2.5 g. No rims sherds were recovered from the site, and no other native ceramic objects, such as balls, gaming pieces, or figurines, were identified in the collection. All three sherds came from XU3-4.

A noted previously, two of the sherds exhibited smoothed primary surface treatment and the third was simple-stamped. One of the smoothed sherds showed of possible brushing, and the other exhibited two parallel lines of cord-impressed decoration. One of the measurable sherds was fairly thin at 4.30 mm maximum thickness, while the other was thicker at 6.31 mm maximum thickness. Taken together, such ceramic attributes point to a Late Plains Village assemblage, although the sample is hardly large enough to be definitive. A Middle Plains Village affiliation cannot be entirely ruled out based on the available evidence.

Stone Tools

Only one stone tool was recovered from the 2010 Karishta excavations. It was a fragment of a patterned small thin biface made of Knife River flint. Functional analysis revealed the specimen to be the tip of a finished but broken arrow point. The specimen suggests that hunting was one activity that involved the Karishta site occupation.

Flake Debris

In all, only six pieces of G1-3 flake debris were in the Karishta collection. All came from XU3-4, except for one G4 specimen from XU5-6. The recovery of the single G4 specimen was fortuitous because ordinarily such a small-sized flake would have passed through the one-quarter-inch mesh screens used in the field.

The small sample from Karishta consists of one G2 flake, four G3 flakes, and one G4 flake, all of Knife River flint (KRF). Together they weigh a total of 4.5 g, with the larger G2 specimen weighing in at 2.6 g alone. The G2 flake is a cortical flake; one of the G3 flakes is a bifacial thinning flake, one is a small piece of shatter (with cortex), and two are pressure flakes; the G4 flake is also a pressure flake. The sample is far too small to make any meaningful attempt at interpretation.

Fire-Cracked Rock

Four pieces of fire-cracked rock (FCR) were in the Karishta collection. By size grade breakdown, the sample consists of one G1 piece (76.8 g), one G2 piece (4.0 g), and two G3 pieces (1.0 g total). All of the FCR pieces were granite, and all were recovered from XU3-4. The larger G1 FCR was piece-plotted along with the distal humerus of a bison in the bottom of Level 4 (see Figures 3.20b and 3.21). The sample is too small for meaningful interpretation, but the mere presence of FCR indicates that fires were in use at the site.

Vertebrate Faunal Remains

Sixty-three pieces of fragmented animal bone were recovered from the 2010 excavations at Karishta. Most of these derive from XU3-4, with a size grade breakdown of one G1 piece (225.9 g), two G2 pieces (7.8 g), and 51 G3 pieces (19.4 g). Another nine pieces of bone came from XU5-6, including three G2 pieces (6.9 g) and six G3 pieces (1.9 g). Obviously, the majority of the bone is highly fragmentary. The single G1 piece, which accounts for 86.3% of the aggregate bone sample by weight, is the only more or less intact and identifiable element in the collection; it was identified as the distal portion of the left humerus an American bison (*Bison bison*); the humerus has a spiral fracture of the diaphysis, which is evidence of marrow extraction. A much smaller G2 piece of bone refits onto the larger G1 element and was counted as identifiable bone along with it.

One piece of what appears to be a fragment of a bone tool (modified bone) was noted in the collection. It is a small (G3), thin piece of bone with two parallel, modified edges. One modified edge, the thicker of the two, is smoothed and rounded and the other edge is very thin and sharp, like a cutting tool edge. The surfaces of the piece are smooth and glossy with many fine striations. The sharp edge shows signs of use-wear like one would expect of a light duty, soft material cutting tool. The narrowest end of the piece is squared-off and smoothed and appears finished. It is our thinking that the specimen is the distal end of a thin, narrow bone knife blade. Unfortunately, the piece is too small for effective photo illustration.

Other Artifacts and Materials

Other artifacts and materials present in the Karishta collection include shell, natural clinker, wood/charcoal, and modern European American (EA) artifacts. Each of these material classes is discussed in the paragraphs that follow.

Shell

The shell sample consists of a single piece of G3 identifiable shell. The specimen is a snail shell that is in all probability natural to the deposit. No freshwater mussel shell was found in the Karishta excavations.

Natural Clinker

Clinker is a very porous, lightweight stone of coal-burn origin that occurs naturally in western North Dakota (Root et al. 1999). Resembling pumice, clinker was commonly used as an abrading tool material. Three small pieces of natural clinker are present in the Karishta collection, including one G2 specimen and two G3 specimens. Natural clinker is light enough to float in water, and in this context we believe that it was probably naturally deposited in the site by over-bank flows of the Knife River.

Wood/Charcoal

A few very small pieces of wood or wood charcoal were recovered from general level contexts in the Karishta excavations. XU1-2 produced 0.2 g of G3 charred wood, which is likely modern given the location of XU1-2 on the floodplain proper. XU3-4 produced 0.1 g of G3 wood charcoal, which is probably archeological. The wood charcoal could be used for radiocarbon dating, but given its general level context, the sample might not necessarily give an accurate date for the LPV-B component.

European American Historic Artifacts

Four pieces of historic artifactual material of modern European American origin are in the site collection, all recovered from XU1-2 on the Knife River floodplain. Included among these are one G3 piece of flat glass (lilac-colored) and three pieces of coal clinker (two G3 pieces and one G4 piece). The two G3 pieces of coal clinker were difficult to identify positively because they bear considerable resemblance to burned bone; however, if the pieces are in fact bone they most likely would be fossil bone of natural origin and not archeological bone.

Chapter 6
SYNTHESIS AND INTERPRETATION

Introduction

The 1978 excavations in the south-central part of the Elbee site identified as many as eight archeological components, including a prominent earthlodge village component, a much less prominent preceramic component, and a historic farmstead component (Ahler ed. 1984). In no particular order, these eight components are:

- Primary Middle period Plains Village tradition earthlodge village component.
- Preceramic period (Late Plains Archaic tradition) component.
- Late period (Post-Contact) Plains Village tradition component.
- Historic farmstead component.
- Ephemeral Plains Village tradition components of the Nailati phase, Heart River phase, and/or Scattered Village complex.
- Ephemeral Plains Woodland tradition component.

The 2003 investigations at Elbee, in the northern part of the site, were able to positively identify only the primary Middle Plains Village period earthlodge village component, except for the presence of scattered historic debris related to the historic (modern) farmstead component.

The 2010 investigations at the Elbee and Karishta sites did not necessarily add to the component list, which is fairly comprehensive, but they were able to reconfirm the presence of the primary Middle period Plains Village component, as well as a Late period Plains Village component, both located on the A terrace area of the site, and both exhibiting village features. On the B terrace area to the north, we were also able to find evidence of Middle period and Late period Plains Village occupations, but these were much more ephemeral in nature than the main village occupations on the A terrace. Just how these A terrace and B terrace components might relate to one another is unclear at this time, but their close spatial proximity does suggest some kind of linkage between contemporary components.

Culture History and Chronology

The A terrace area of the Elbee site was found to contain evidence of two Plains Village tradition earthlodge village components. The older, Middle period component was radiocarbon dated to the middle A.D. 1400s or 1500s, and affiliated with, or at least related in some way to, the Scattered Village complex. The Scattered Village complex, generally dated to ca. A.D. 1400-1600, was originally defined to account for certain less prominent village components within the KNRI that produced ceramic assemblages that were not fully compatible with existing wares (Lovick and Ahler 1982:209-212). Key components of the complex are found at the Forkorner, Hump, and Youess sites in the KNRI (Ahler and Mehrer 1984). Such an interpretation is controversial, however, because a Scattered Village complex affiliation was denied by the earlier study of the central part of Elbee, which instead suggested a relationship to the Extended Coalescent variant of north-central South Dakota (Ahler ed. 1984; see Lehmer 1971). In the summary of Plains Village cultural taxonomy for the Knife River region, the main Plains Village component at Elbee was left unclassified as to phase, complex, or ethnic tradition, with the previous Extended Coalescent variant assignment apparently dropped as well (Ahler 1993:76). Furthermore, use of the Scattered Village complex was discontinued altogether in the taxonomic summary, replacing it with two newly defined phases: the Scattered Village phase and the Mandan Lake phase (Ahler 1993:80-85). Be this as it may, a reassessment of the Scattered Village complex vis-à-vis the Northeastern Plains Village complex lends some credibility to the Scattered Village complex as a viable archeological taxon, as well as supporting a Scattered Village complex interpretation for the primary village component at Elbee, particularly in light of its age and ceramic attributes (Toom 2004).

The second Plains Village tradition earthlodge village component identified in the southern A terrace area at Elbee is a Late period component that was radiocarbon dated to the late A.D. 1700s. This date places it within the Post-Contact time frame (after ca. A.D. 1600) and indicates a general Post-Contact Coalescent variant affiliation (Lehmer 1971). Too little information is available for this component to offer an assessment as to its place in the current Plains Village cultural taxonomy for the Knife River region, although the Minnetaree phase would be a likely candidate (Ahler 1993:89-92).

The B terrace area at Elbee was also found to contain evidence of two Plains Village components, but definitely not earthlodge village occupations. The earliest B terrace component was radiocarbon dated to the middle A.D. 1300s, also within the Middle Plains Village period, but somewhat earlier than the Middle period village component on the A terrace.

The second, later Plains Village component in the B terrace area at Elbee is dated to the Late Plains Village period based largely on its stratigraphic position above the level of the Middle period component. Little is know about this rather ephemeral occupation for which no radiocarbon dates are available.

A single Late Plains Village component also was identified at the Karishta site, just north of the northern limit of Elbee on the B terrace. It is thought to be one and the same as the Late period component in the B terrace area of Elbee. Little is known about this ephemeral occupation, either, and it was not radiocarbon dated.

Subsistence Economy

Like most other Middle Missouri village components, the occupants of the Elbee village had a tripartite subsistence economy based on (1) bison hunting, (2) horticulture, or garden agriculture, and (3) broad spectrum hunting and gathering, or foraging (Toom 1992a, 1992b). We know this because the 2003 site collection contained remains from all three of these subsistence practices (Toom et al. 2004). In terms of hunting, Bison elements dominated the vertebrate faunal assemblage, particularly when likely non-subsistence (small animal) elements are eliminated from consideration. The presence of a minority of elements from large- and medium-sized animals is indicative of some general foraging hunting as well. On the gardening side of subsistence, four native cultivars were identified in feature flotation and water screen samples from the 2003 excavations: (1) corn (*Zea mays*), (2) beans (*Phaseolus vulgaris*), (3) sunflowers (*Helianthus annuus*), and (4) squash (*Cucurbita pepo*). These four species represent the primary native food cultivars grown by northern Plains Village peoples (Toom 1992b). Identified wild plants included weeds and herbs, as well as fruit-bearing shrubs and small trees. Seeds of goosefoot (*Chenopodium*), purslane (*Portulaca oleracea*), and dogwood (*Cornus stolonifera*) seeds were identified in feature fill (pit and hearth) samples. Goosefoot and purslane are edible wild plants. Known as Kinnikinnick, the dried inner bark of red dogwood was used for smoking (Gilmore 1977:56). Identified wild fruits were plum (*Prunus americana*), chokecherry (*Prunus virginiana*), and buffaloberry (*Shepherdia argentea*).

The primary goal of the 2003 investigations at Elbee was the excavation of village features, such as pits and hearths, as indicated by geophysical survey findings. The 2010 investigations were not as targeted and had essentially different goals, therefore, the findings of the 2010 excavations are not fully comparable to those conducted in 2003. For example, no pits were excavated in 2010 and, as a consequence, no domesticated or wild plant remains were recovered from the excavations. The remnant of a basin hearth (F201) was partially excavated in 2010, but its fill produced only wood charcoal remains. The only point of comparison between the 2003 and the 2010 excavations regarding subsistence is the fact that bison remains wholly dominated both vertebrate faunal samples.

Settlement Pattern

A settlement pattern describes the way a people occupy and distribute themselves across the landscape in order to acquire or produce subsistence goods. The position of site components within a general settlement system is inferred through considerations of site function based on detailed artifactual

and ecofactual analyses. In other words, determining the function of a site occupation through in-depth technological and subsistence (economic) studies is a key first step in identifying its particular position in the overall settlement pattern of a prehistoric culture. The components in question can then be assigned to recognized settlement types such as those proposed by Binford (1980), which seem to have considerable relevance to the late prehistoric cultures of the region.

For example, the mixed economy of Plains Village peoples, which, as we have seen, is based on a combination of big game hunting, horticulture, and general foraging, would require a logistical organizational strategy for the procurement of plant and animal resources. Under a logistical strategy, specific resources were produced by specially organized task groups.

> Logistical strategies are labor accommodations to incongruent distributions of critical resources or conditions which otherwise restrict mobility. Put another way, they are accommodations to the situation where consumers are near one critical resource but far from another equally critical resource. Specially constituted labor units - task groups - therefore leave a residential location, generally moving some distance away to specifically selected locations judged most likely to result in the procurement of specific resources (Binford 1980:10).

It is the horticultural practices of Northern Plains Villagers at their permanent villages, most of which were located in the Missouri River valley, that would have been the primary factor restricting mobility at various times of the year among these semisedentary peoples. Special task groups dispatched from the villages would have included hunting and gathering parties whose main task was the collection of wild plant and animal resources between periods of maximum horticultural activity (see Hurt 1969; Richtsmeier 1980; Toom 1992b). The acquisition of other raw materials (e.g., plant foods and lithics) was probably a secondary concern of these task groups.

The logistical organization of Plains Villagers indicates a collector type of settlement-subsistence system (Binford 1980:10-12). General site types identified for collectors include: (1) residential bases, (2) locations, (3) field camps, (4) stations, and (5) caches. The residential base is "the hub of subsistence activities, the locus out of which foraging [collecting] parties originate and where most processing, manufacturing, and maintenance activities take place" (Binford 1980:9). The permanent or recurrently occupied earthlodge villages of Plains Villagers were their residential bases. Locations, which are also often referred to as activity areas, are special-purpose sites devoted exclusively to resource production or acquisition. In the case of Plains Villagers, these would have included garden plots, animal-kill and kill processing (butchering) sites, gathering areas, quarries, and similar specialized activity loci. A field camp is a temporary base of operations for a task group while it is away from the main residential base. Stations are special-purpose sites used by task groups to gather information. And caches are sites where bulk subsistence goods are temporarily stored in the field while awaiting transportation to the residential base. Individual burial sites and cemeteries are other special-purpose site types, or feature types within a larger site complex, that can be added to this model for late prehistoric cultures in the Northern Plains.

Given the presence of domestic village features in the A terrace area at Elbee, including pits, hearths, and house remains, it is clear that the site functioned as a residential base (earthlodge village) in the overall settlement pattern of its occupants (Ahler ed. 1984; Toom et al. 2004). The only village features uncovered in the 2010 excavations were the posthole and smaller pole hole features found in XU9. These we believe are internal features of a much larger earthlodge (house) feature. The presence of domestic structures such as these on the A terrace at Elbee reconfirms that its village components functioned as residential bases.

The B terrace occupations at Elbee and Karishta are another matter entirely. While the evidence bearing on these marginal Plains Village components is scant, they appear to represent temporary campsite or special-purpose activity locations and not earthlodge village occupations. This is not to say, however, that the B terrace occupations are unrelated to those on the A terrace. Quite the contrary, the mere proximity of all of the Plains Village components at Elbee and Karishta suggests some kind of relationship between contemporary occupations.

Technology and Feature 201 Function

The general technology in use at the Elbee village site was typical of the Middle Plains Village period in the Northern Plains. Ceramic vessels were used for cooking and perhaps for storage. Bone tools were also common, especially bison scapula hoes, or gardening tools. A variety of chipped stone tools and pecked and ground stone tools were utilized at the site for various manufacturing and maintenance tasks. The bow and arrow was the primary projectile weapon used for hunting and defense. Knife River flint was used almost exclusively in the manufacture of chipped stone tools, as one would expect given the location of the site on the Knife River not far from the main Knife River flint quarries. Other western North Dakota lithic resources were also used but only in relatively small quantities.

Most importantly is the solid evidence for the use of earthlodge-type houses. Both direct and indirect evidence for the presence of earthlodges has been found for the A terrace village components during all three episodes of site investigation. It is this feature of the site—the earthlodge—that is one of its most defining attributes. Direct evidence of earthlodges was found in 1978 by the partial excavation of a circular pattern of house floor features (Ahler ed. 1984). Indirect evidence of houses in the 2003 excavations consisted of the presence of an earthlodge-type basin hearth and two possible intramural storage pits, which are not often found beyond the confines of earthlodge villages. Finally, the 2010 excavations found additional evidence of possible internal earthlodge features in the form of a shallow posthole and a linear pattern of smaller pole-like holes, all in close association in the southern part of the site in XU9. The smaller pole holes were interpreted to mark a possible screen or divider within a larger house structure, with the shallow posthole being a support for some other internal feature, such as a bed post or a hearth rack. To my mind, these likely internal earthlodge features were the most interesting and exciting find of the 2010 fieldwork, because they show that there is much more to be learned about village architecture at Elbee through additional excavations in the A terrace village area.

Lastly, we must not neglect to mention the basin hearth remnant (F201) exposed in the Knife River cutbank in the B terrace area of the Elbee site. It was this feature that sparked renewed interest in conducting additional excavations at the site in 2010. F201 was a rather deeply buried basin-shaped hearth, of that there is no doubt. Wood charcoal from the feature, identified as willow or cottonwood, was used to date the hearth to the middle A.D. 1300s, approximately 100 years or more earlier than the Middle Plains Village period earthlodge village on the A terrace, with which the hearth was initially thought to be associated. The somewhat earlier date for F201 puts into doubt its association with the primary A terrace village, but does not necessarily negate it entirely, radiocarbon dating interpretations notwithstanding.

Unfortunately, F201 could not be directly excavated because of its location in the high, vertical Knife River cutbank in combination with the inclement weather conditions that plagued the fieldwork. In short, the cutbank was just too unstable and wet, most of the time, to risk direct excavation by conventional means. For these reasons, XU6 was excavated near the cutbank edge, opposite the F201 location, in an attempt to come down on the western (inland) edge of the feature. The bottom level of XU6, Level 9, was associated with the F201 hearth exposure in the cutbank. The 4 m^2 of Level 9 produced a total of 246 artifacts, a number that is actually less impressive than it sounds. The only prominent artifact found in Level 9 was the base of a broken ceramic vessel that was unfired (or underfired). Nearly all of the 68 body sherds recovered from Level 9, accounting for 27.6% of all recovered artifacts, came directly from this unfired pot base (Table 6.1). Eleven of the sherds did not come directly from the pot base, but were recovered from the same square and level, and are believed to derive from it. Naturally, the pot base, being the only prominent artifact in Level 9, was linked directly to the function of the nearby basin hearth, leading to the speculation that the hearth functioned as some kind of open firing feature for the production of native ceramics. The unfired nature of the pot base added fuel to the fire, so to speak, for such conjecture, with the pot base interpreted as a “waster” vessel that had broken just before or during the firing process. However, the lack of big sherds from other waster vessels would seem to discount a pottery firing feature interpretation for the F201 hearth. In this regard, it may be instructive to examine the other artifacts that were associated with the F201 hearth, as well as the stratigraphic characteristics of the structure of the hearth itself, as revealed in the cutbank exposure.

The overwhelming majority (166 or 67.5%) of the Level 9 artifacts are small-sized (G2 and G3) unidentifiable animal bone fragments (Table 6.1). As noted above, the second most abundant class of artifacts were the body sherds from the unfired pot base that was uncovered in this level. The rest of the

artifacts from Level 9 include two stone tools, two pieces of flake debris, seven pieces of fire-cracked rock (FCR), and one piece of unmodified natural clinker (Table 6.1). We shall examine these each in turn, except for the body sherds already discussed.

Fragmented animal bone is typically viewed as subsistence debris, specifically debris from bone grease production (e.g., Vehik 1977). While the Level 9 bone fragments are mainly quite small and not especially numerous for such an activity, it is a possibility nonetheless. One would also expect to see greater numbers and larger pieces of FCR in a food production context, but this is not necessarily so for native peoples with ceramic vessels (i.e., stone boiling is less common a practice among peoples with cooking pots).

Table 6.1. Summary of Artifacts Recovered from XU6, Level 9, in Association with the Basin Hearth (F201), Elbee Site (32ME408), 2010 UND Fieldwork.

Artifact Class	Artifact Count					
	G1	G2	G3	G4	Total	%
Stone Tools		1	1		2	0.8
Flake Debris			1	1	2	0.8
Fire-Cracked Rock	1	1	5		7	2.9
Natural Clinker			1		1	0.4
Pottery Body Sherds	2	17	49		68	27.6
Unidentifiable Bone		7	159		166	67.5
Total	**3**	**26**	**216**	**1**	**246**	**100**

The two stone tools from Level 9 are of some interest. One was a small thin patterned biface that was interpreted to be an unfinished arrow point (see Figure 4.3c). The other is a small fragment from a clinker abrading tool. The unfinished arrow point suggests stone tool manufacture, but such a specimen could have been put to other, less obvious uses, such as for fine cutting or marking tasks. In this regard, the near total absence of flake debris, particularly small-sized flake debris, argues against stone tool manufacture at this location. The clinker abrading tool points to the manufacture and final finishing of other tools or even ornaments, such as those of bone or wood. Moreover, the presence of a piece of apparently unmodified natural clinker, presumably debris from clinker abrader manufacture or use, serves to reinforce such an interpretation.

Based on the portable artifact evidence at hand, one would have to say that interpretation of the F201 hearth is equivocal. The unfired pot base suggests a special-purpose hearth that might have been used for firing pottery. On the other hand, the other artifacts found in association with the hearth are indicative of a more general-purpose hearth that was the locus of activities such as food preparation and manufacture and finishing of other items. Still, the available data are scant and do not lend themselves well to one interpretation over the other. Perhaps all of these activities took place around F201. One thing that is certain is this: whatever the nature of the work that was done around F201, it was not done very intensively or for very long. The paucity of artifacts argues quite cogently for an ephemeral, short-term activity structure, whatever it may have been.

The profile of the F201 hearth exposure is one final piece of evidence that can be added to this puzzle. The F201 basin hearth proper appeared itself to have been built in a shallow, broader basin, or depression, based on profile observations made in the cutbank exposure. This broad, shallow basin was marked by the presence of a thin band of ashy-looking, gray-colored soil that occasionally exhibited very fine charcoal flecking (see Figures 3.30 and 3.31). Such a construct—a basin hearth within a larger, shallow basin, or small depression—just might be what Plains Village peoples would have used for open firing their pottery. It is our thinking that the gray, ashy-looking band would have been the product of piling additional fuel, in the form of small tree branches or even dried grass, around and on top of the central basin hearth, which contained the vessels to be fired, and produced the initial heat necessary for the firing process. Because Middle Plains Village pottery is often buff colored or light gray after firing,

indicating firing in a variable but generally oxidizing atmosphere, a relatively open, quick burning fire that also would allow for considerable airflow is suggested. Such a fire would have conceivably produced a lot of fine ash and charcoal, thereby coloring the surrounding surface of the wider basin, as observed in cutbank profile, as well as the XU6 profile. This method of piling on smaller, hot-burning fuel would have achieved the desired bonfire effect needed for a successful open firing, particularly one with an oxidizing atmosphere (cf. Rice 1987:153-158; Rye 1981:96-98).

While of course much of the foregoing scenario is mere speculation, it does make a pottery firing function for the F201 basin hearth seem all the more plausible. Additional excavation around F201 would have been necessary to confirm the presence of the larger basin surrounding the F201 hearth, and to possibly recover more ceramic pieces and other artifacts on which to base a more cogent interpretation, but available resources and time did not allow for such a contingency.

Artifact and Architectural Style

The native ceramic assemblage from the 2010 excavations consists of a group of two different traditionally defined wares: Buchanan ware and Riggs ware. Both have everted, straight to out-curved rim forms. The differences in ware classification mainly involve certain subtleties of decoration and lip form. All could be classified as the more recently defined Stanton ware (Ahler 2001) if one chooses to abandon the older wares. It is significant that no S-rims were identified in the assemblage, suggesting that the occupants of Elbee had not lived on the Missouri River for any length of time, and had had little contact with the long-term residents of the upper Middle Missouri region prior to their arrival.

The 2010 ceramic sample is small and for that reason it is not a fair comparison to the larger 1978 and 2003 samples. Except for the absence of S-rims, the ceramic sample from the 2003 excavations compares somewhat favorably with that from 1978. The 2010 sample also lacks S-rims, as well as Knife River ware rims, which were represented in both the 1978 and 2003 samples. S-rims comprise 21.9% of the 1978 sample, so this vessel form is not entirely absent from the composite Elbee ceramic assemblage. The remaining 78.1% of the vessels in the 1978 sample have straight, everted rims, including straight unbraced rims at 37.5% and straight braced rims at 40.6% (Table 6.2). The straight braced rims are classifiable as Knife River ware, and the straight unbraced rims are classifiable as either Buchanan ware or Riggs ware depending on their particular decorative application and lip form. Of special note in the 1978 and 2003 samples are the several horizontally incised or trailed straight-rim vessels, all of which are classifiable as Buchanan ware. One of the Buchanan Horizontally Incised/Trailed specimens in the 1978 sample exhibits what appears to be a channeled lip (Ahler ed. 1984:Figure 20[24]). Lip channeling is an attribute specifically associated with the Northeastern Plains Village complex (Toom 2004:287); it also has been tentatively identified on a number of Scattered Village complex vessels from the Forkorner, Hump, and Youess sites illustrated by Ahler and Mehrer (1984). The commonality of such a specific decorative attribute, some might say a symbol, leaves little doubt that some kind of relationship exists between the Elbee ceramic assemblage and those of the other Scattered Village complex sites. The emphasis in these assemblages on horizontally incised or trailed line decoration is another obvious linking attribute, regardless of whether they are on straight rims or S-rims.

Turning to the other Scattered Village complex components at the KNRI at the Forkorner, Hump, and Youess sites, composite ceramic data do indicate a preponderance of S-rim vessels in their samples. Overall, 80.9% of the classified vessels were classified as S-rim wares, and 19.1% were classified as straight rim wares (Table 6.2). The overwhelming numbers of S-rims in the Forkorner, Hump, and Youess assemblages certainly do constitute a significant departure from the aggregate Elbee assemblage, which exhibits a preponderance of straight rims over S-rims. Explaining such a discrepancy in terms other than sampling bias is not readily done. Perhaps what we are looking at are temporal or phase differences within the larger Scattered Village complex itself. In this regard, it is of interest to note that not one straight braced rim is recorded in the Forkorner, Hump, and Youess samples. This suggests that the other Scattered Village complex components are somewhat earlier than the Elbee component, which has 31.8% straight braced rims overall in its aggregate ceramic sample. Such a conclusion is born out by the radiocarbon dating of the Forkorner, Hump, and Youess components, which places their occupations in the late A.D. 1300s to the early A.D. 1400s (Ahler and Mehrer 1984:212, 258, 279).

Table 6.2. Summary of Classified Ceramic Vessels from the Elbee Site and Scattered Village Complex Sites and at the KNRI. Data are from Ahler ed. (1984:72), Ahler and Mehrer (1984:216, 230, 245, 263, and 284), Toom et al. (2004:4.23), and this report.

Site Name		Straight Rim	Straight Braced Rim	S-Rim	Total
Elbee (1978)	n	12	13	7	32
(32ME408)	%	37.5	40.6	21.9	100.0
Elbee (2003)	n	8	1		9
(32ME408)	%	88.9	11.1		100.0
Elbee (2010)	n	3			3
(32ME408)	%	100.0			100.0
Forkorner (West)	n	9		81	90
(32ME413)	%	10.0		90.0	100.0
Forkorner (East & Central)		5		28	33
(32ME413)	%	15.2		84.8	100.0
Hump	n	2		11	13
(32ME414)	%	15.4		84.6	100.0
Youess	n	32		83	115
(32ME415)	%	27.8		72.2	100.0
Total	n	71	14	210	295
	%	24.1	4.7	71.2	100.0

Another possibility well worth considering is the association of Knife River ware in Elbee ceramic samples with a Late Plains Village component rather than the more prominent and extensively studied Middle Plains Village component. Knife River ware is not commonly found in KNRI village sites until after ca. A.D. 1600 (Ahler and Swenson 1993:124). Previous studies had assumed that only one village component was represented in the A terrace area at Elbee, that dating to the Middle Plains Village period, but associating Knife River ware (which is typically a Late period ware) with this Middle period component creates something of a temporal anomaly that is not easily explained. Now that the presence of Late period village features has been established by the present study, at least in the southern part of the A terrace village area, it is logical to attribute Knife River ware from A terrace contexts to this later village component. In this regard, it is probably no coincidence that the single Knife River ware rim in the 2003 sample comes from a plow zone context rather than a dated feature context. The situation regarding the provenience of straight braced rim pottery (Knife River ware) in the 1978 sample is much more complex and cannot be sorted out quite so easy in terms of Late versus Middle period component associations. Nevertheless, the proposition that Knife River ware from A terrace contexts at Elbee is best attributed to the Late Plains Village component is certainly worth entertaining.

The presence of at least one circular earthlodge at Elbee is of considerable importance regarding house style. The circular earthlodge was a relatively late development in the Northern Plains and is definitive of what is generally referred to as the Coalescent subtradition of the Plains Village tradition (see Lehmer 1971). Just why a circular house is present at Elbee at a time when one might expect to find the earlier rectangular-style earthlodge still in use is presently unclear (cf. Ahler ed. 1984:208-209). Perhaps the occupants of Elbee were relatively recent arrivals on the Missouri River and were among the first to adopt the new house form. On the other hand, simple circular houses may have been typical of the Scattered Village complex and its suggested predecessor, the Northeastern Plains Village complex.

Unfortunately, the house type of the Northeastern Plains Village complex is unknown, at least in its earlier, late prehistoric phases (Toom 2004).

Regional Interaction and Territoriality

If the proposed connection between the Northeastern Plains Village complex and the Scattered Village complex is correct (Toom 2004), at least in terms of the Elbee site, then it can be posited that the occupants of Elbee were originally residents of eastern North Dakota. The preponderance of straight-rim vessels in the Elbee collection, as well as vessels directly classifiable as Buchanan ware, makes such a relationship seem all the more likely. S-rim vessels are unknown in Northeastern Plains Village complex assemblages prior to ca. A.D. 1600, and an emphasis on straight-rim vessels with decorated lips and horizontally incised or trailed line decoration are among the hallmarks of Middle period Northeastern Plains Village assemblages. The presence of two smoking pipe fragments possibly made of catlinite in the 2003 Elbee collection is another Northeastern Plains Village indicator, pointing to the eastern Dakotas and the catlinite quarries in southwestern Minnesota. Michael Gregg, writing in the North Dakota State Plan, states that "regular occurrence of catlinite artifacts" is one of the defining characteristics of the Northeastern Plains Village complex (SHSND 1990:B.36).

Environmental Reconstruction and Cultural Ecology

The investigations at Elbee in 2010 were not extensive enough to provide much in the way of new information on the related topics of environmental reconstruction and cultural ecology. It can be noted that the primary Plains Village components at the site, situated in the surface of the Knife River A terrace, are associated with the present surface A soil horizon. This obvious lack of any major depositional or erosional events in relation to former village occupation surfaces within the A horizon suggests that the climate of the past, when the site was occupied, differed little from the climate of today (twentieth century climate).

Chapter 7
SUMMARY AND RECOMMENDATIONS

In May and June 2010 the University of North Dakota archeological field school conducted test excavation work at the Elbee archeological site (32ME408) in the Knife River Indian Villages National Historic Site, Stanton, North Dakota. The work was done in cooperation with the National Park Service (NPS) to test and evaluate untested parts of the site, and to investigate archeological features exposed by erosion in the Knife River cutbank as a result of spring flooding in recent years. NPS personnel conducted a new geophysical survey of the northern part of the site in support of the testing effort. Five 2-x-2-m excavation units (XUs) of varying depths were dug at the site, two in the A terrace village area and three in the lower elevation B terrace area. In addition, three 1-x-2-m excavation units were dug at the nearby Karishta site (32ME466) in an attempt to verify its location relative to existing documentation.

Excavation Unit 5 (XU5), dug into the surface of the northern part of the A terrace village area, reconfirmed the presence of Middle period Plains Village deposits in this part of the site. XU9, dug into the surface of the southern part of the A terrace village area, uncovered Late period Plains Village deposits. This came as something of a surprise because while Late period deposits had been posited for the site, none had actually been discovered up to this point. In addition to the recovery of portable artifacts, XU9 exposed a shallow posthole and a number of smaller, pole-hole sized features that were interpreted to be the remains of internal earthlodge features. The likely existence of a Late Plains Village earthlodge at the XU9 location is thought to be the most important discovery made by the 2010 investigations.

XU6, a deep excavation in the far northern part of the site, in the B terrace area, was placed near the remnant of a basin hearth exposed in the Knife River cutbank and designated Feature 201 (F201). While we were not able to directly excavate the hearth by conventional means because of cutbank instability and safety issues, we were able to gather considerable information on the feature by profiling and from the adjacent inland excavation. Wood charcoal from the hearth itself was radiocarbon dated to the middle A.D. 1300s, placing it within the earlier part of the Middle Plains Village period. This makes the hearth around 100 years or more older than the Middle Plains Village period village occupation on the adjacent A terrace, which was radiocarbon dated to the middle A.D. 1400s or 1500s. In the field, it was speculated that F201 functioned as a part of an open pottery-firing feature, largely because the base of an unfired pot was found in proximity to the hearth. Later, in the lab, a full consideration of associated artifacts pointed to a more general-purpose interpretation for the feature, but not necessarily negating the supposed pottery firing function. In other words, the available data are equivocal when it comes to a specific functional interpretation for the F201 basin hearth. Still, the possibility that the hearth was used during an open (bonfire) firing of pottery vessels is intriguing and worthy of further study. In order to accomplish this, XU6 would have to be expanded to recover additional artifacts in association with the F201 location.

XU7 and XU8, also deeper excavations dug into the B terrace area, uncovered evidence of a Late Plains Village period component, as did the upper levels of XU6. This component is rather ephemeral and did not produce many artifacts. It is believed to be the same component as that identified at the nearby Karishta site, a short distance to the north.

The excavations in the B terrace area established that low-density artifact deposits dating to the Middle and Late Plains Village periods are present in this far northern part of the Elbee site. However, while these occupations may have been related to the earthlodge village components on the A terrace, they did not contain village features themselves. Rather, the B terrace occupations were probably the locations of short-term campsites and/or special purpose activity areas.

The test excavations at Karishta, also located on the B terrace, confirmed that this site is situated essentially as indicated on the original site documentation. Karishta was found to contain a near-surface, low-density artifact deposit that is in all probability of Late Plains Village affiliation. In fact, we believe that the Late Plains Village component at Karishta is one and the same as that identified just to the south in the B terrace area of Elbee. It is possible, even likely, that said Late Plains Village component is more or less continuous, covering the entire B terrace area from Elbee to Karishta. If this is so, then the boundaries of the Karishta site could be extended somewhat to the west and south, linking Karishta to the

far northern boundary of Elbee. However, additional testing would be needed to confirm that expansion of the Karishta site area is warranted.

The Elbee site has once again proven itself to be a significant archeological resource and a contributing property of the Knife River Indian Villages National Historic Site Archeological District. It seems to us that the Middle Plains Village period village at Elbee just might be the key to gaining a better understanding of the Hidatsa *entrada* into the Knife River region. On the other hand, the numbers of artifacts at the Karishta site were quite low, cultural-temporal diagnostic artifacts were almost nonexistent, and the site does not appear to contain any archeological features. Karishta is therefore evaluated as not significant and not a contributing property of the archeological district.

In terms of future research at Elbee, additional excavation work in the southern site area is recommended to explore the nature of the newly discovered Late Plains Village component. Specifically, expansion of XU9 to test the hypothesis that a Post-Contact Coalescent variant earthlodge is present at this location ought to be most instructive. In the northern part of the site, the continued monitoring of the Knife River cutbank for newly exposed features also is recommended.

Chapter 8
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APPENDIX A

Identification of Charcoal from the Elbee Village Site (32ME408), North Dakota

IDENTIFICATION OF CHARCOAL FROM THE ELBEE VILLAGE SITE (32ME408), NORTH DAKOTA

By

Kathryn Puseman

With Assistance from
Peter Kováčik

PaleoResearch Institute
Golden, Colorado

PaleoResearch Institute Technical Report 11-011

Prepared For

University of North Dakota
Grand Forks, North Dakota

January 2011

INTRODUCTION

Charcoal from the fill of a basin-shaped hearth at the Elbee Village site (32ME408) was submitted for identification. This hearth was exposed in an erosional cutbank of the Knife River and contained an abundance of charcoal. The Elbee site is an extensive earthlodge village in west-central North Dakota dating to the A.D. 1500s. The hearth was found away from and stratigraphically below the level of the village and might reflect an earlier occupation of the area.

METHODS

Charcoal Identification

The charcoal samples were passed through a graduated screen (US Standard Sieve) with a 10-mm opening. The five charcoal fragments remaining in the 10-mm sieve were separated from the other sample debris and weighed, then each piece was broken to expose fresh cross, radial, and tangential sections. Charcoal fragments were examined under a binocular microscope at a magnification of 70x and under a Nikon Optiphot 66 microscope at magnifications of 320-800x. Charcoal fragments were identified using manuals (Carlquist 2001; Core, et al. 1976; Hoadley 1990; Panshin and de Zeeuw 1980) and by comparison with modern and archaeological references.

DISCUSSION

The Elbee site, 32ME408, is located on the first terrace above the Knife River floodplain in Mercer County, North Dakota. Local vegetation in this area consists of mixed-grass prairie and riparian forest. The site represents an earthlodge village reflecting the Scattered Village complex of the Plains Village tradition, and occupation has been radiocarbon dated to the A.D. 1500s (Dennis Toom, personal communication, January 5, 2011).

Feature 201 is the remnant of a basin-shaped hearth noted in the cutbank of the Knife River, approximately 1.5 miles upstream from the confluence of the Knife and Missouri Rivers. This cutbank is located in a former coulee or small drainage way, to the north and off the terrace landform where the earthlodge village is located. It is estimated that only about one-fourth of the original hearth feature is intact. The original feature is believed to have measured about one meter in diameter and about 20 cm in maximum depth. Feature 201 was found at a depth of 90-100 cm below the current ground surface. The occupation surface of the earthlodge village is noted at about 20-30 cm below the surface on the higher terrace to the south.

Charcoal sample 2117 consists of five primary fragments of charcoal believed to represent a single piece of wood (Table 1). These pieces of charcoal represent a member of the Salicaceae, such as willow (*Salix*) or cottonwood (*Populus*), found in the local riparian forests (Table 2). *Salix* and *Populus* are very similar in their anatomy, with the exception that *Salix* contains heterocellular rays and *Populus* has predominantly homocellular rays, although some heterocellular rays occasionally can be present. The five charcoal fragments examined were very friable and fell apart into several small fragments when attempting to break the

charcoal to obtain a fresh break for viewing. Of the five fragments of charcoal present, one piece exhibited heterocellular rays, suggesting an identification of *Salix*. Three fragments appeared to exhibit homocellular rays, although the radial and tangential views were deteriorated and a clear determination was not possible. The fifth piece was too friable and deteriorated to obtain clear radial or tangential section views.

SUMMARY AND CONCLUSIONS

Identification of charcoal from a basin-shaped hearth (Feature 210) eroding out of a cutbank at the Elbee site (32ME408) in west-central North Dakota indicates that a woody member of the Salicaceae was burned, either willow or cottonwood. Identifiable ray characteristics suggest an identification of willow, although the charcoal fragments were too friable and deteriorated for a definitive identification to genus. Even under ideal conditions, these two genera can be difficult to separate with certainty.

TABLE 1
PROVENIENCE DATA FOR A SAMPLE FROM THE ELBEE VILLAGE SITE, 32ME408

Sample No.	Feature No.	Depth (cmbs)	Provenience/ Description	Analysis
2117	201	~100	Charcoal from fill of basin-shaped hearth in an eroded cutbank of the Knife River	Charcoal ID

TABLE 2
IDENTIFICATION OF CHARCOAL FROM THE ELBEE VILLAGE SITE, 32ME408

Sample No.	Identification	Part	Charred		Uncharred		Weights/ Comments
			W	F	W	F	
2117	Sample Weight						1.875 g
Feature 201	CHARCOAL/WOOD:						
	Total charcoal ≥ 10 mm						1.679 g
	Salicaceae (Willow family)	Charcoal		5			1.679 g

W = Whole
F = Fragment
X = Presence noted in sample
g = grams
mm = millimeters

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APPENDIX B

NOSAMS Radiocarbon Data

Beta Analytic Report of Radiocarbon Dating Analyses

Elbee Site (32ME408): NOSAMS Radiocarbon Data, 2010 Samples. National Ocean Sciences Accelerator Mass Spectrometry Facility, Woods Hole Oceanographic Institution.

Receipt #	Date Reported	Submitter Identification	Other description or species	Year collect	Type	Process	Accession #	F Modern	Fm Err	Age	Age Err	d13C	d13C Source	D14C
84907	2/23/2011	32ME408-6, CN2117; F201	wood charcoal from basin hearth cutbank exposure	2010	Charcoal	(OC) Organic Carbon	OS-85446	0.9299	0.0035	585	30	-23.54	MEASURED	-76.87
84908	2/23/2011	32ME408-7, CN2117; F201	wood charcoal from basin hearth cutbank exposure	2010	Charcoal	(OC) Organic Carbon	OS-85447	0.9388	0.0036	505	30	-25	Assumed	-67.95
84909	3/14/2011	32ME408-8, CN2116; F202	from B. bison scapula hoe	2010	Bone	(OC) Organic Carbon	OS-85872	0.9762	0.0030	195	25	-18.11	MEASURED	-30.86

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Darden Hood
President

Ronald Hatfield
Christopher Patrick
Deputy Directors

July 2, 2009

Mr. Jay T. Sturdevant
National Park Services
Midwest Archeological Center
Federal Building
100 Centennial Mall North. Rm. 474
Lincoln, NE 68508
USA

RE: Radiocarbon Dating Result For Sample KNRI09408R01

Dear Mr. Sturdevant:

Enclosed is the radiocarbon dating result for one sample recently sent to us. It provided plenty of carbon for an accurate measurement and the analysis proceeded normally. As usual, the method of analysis is listed on the report sheet and calibration data is provided where applicable.

As always, no students or intern researchers who would necessarily be distracted with other obligations and priorities were used in the analysis. It was analyzed with the combined attention of our entire professional staff.

If you have specific questions about the analyses, please contact us. We are always available to answer your questions.

The cost of the analysis was charged to the MASTERCARD card provided. A receipt is enclosed with the paper report copy. Thank you. As always, if you have any questions or would like to discuss the results, don't hesitate to contact me.

Sincerely,

Digital signature on file

BETA ANALYTIC INC.
DR. M.A. TAMERS and MR. D.G. HOOD
4985 S.W. 74 COURT
MIAMI, FLORIDA, USA 33155
PH: 305-667-5167 FAX:305-663-0964
beta@radiocarbon.com

REPORT OF RADIOCARBON DATING ANALYSES

Mr. Jay T. Sturdevant

Report Date: 7/2/2009

National Park Services

Material Received: 6/16/2009

Sample Data	Measured Radiocarbon Age	13C/12C Ratio	Conventional Radiocarbon Age(*)
Beta - 260975	560 +/- 40 BP	-23.8 o/oo	580 +/- 40 BP

SAMPLE : KNRI09408R01
ANALYSIS : AMS-Standard delivery
MATERIAL/PRETREATMENT : (charred material): acid/alkali/acid
2 SIGMA CALIBRATION : Cal AD 1300 to 1430 (Cal BP 660 to 520)

Dates are reported as RCYBP (radiocarbon years before present, "present" = AD 1950). By international convention, the modern reference standard was 95% the 14C activity of the National Institute of Standards and Technology (NIST) Oxalic Acid (SRM 4990C) and calculated using the Libby 14C half-life (5568 years). Quoted errors represent 1 relative standard deviation statistics (68% probability) counting errors based on the combined measurements of the sample, background, and modern reference standards. Measured 13C/12C ratios (delta 13C) were calculated relative to the PDB-1 standard.

The Conventional Radiocarbon Age represents the Measured Radiocarbon Age corrected for isotopic fractionation, calculated using the delta 13C. On rare occasion where the Conventional Radiocarbon Age was calculated using an assumed delta 13C, the ratio and the Conventional Radiocarbon Age will be followed by "*". The Conventional Radiocarbon Age is not calendar calibrated. When available, the Calendar Calibrated result is calculated from the Conventional Radiocarbon Age and is listed as the "Two Sigma Calibrated Result" for each sample.

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12=-23.8:lab. mult=1)

Laboratory number: **Beta-260975**

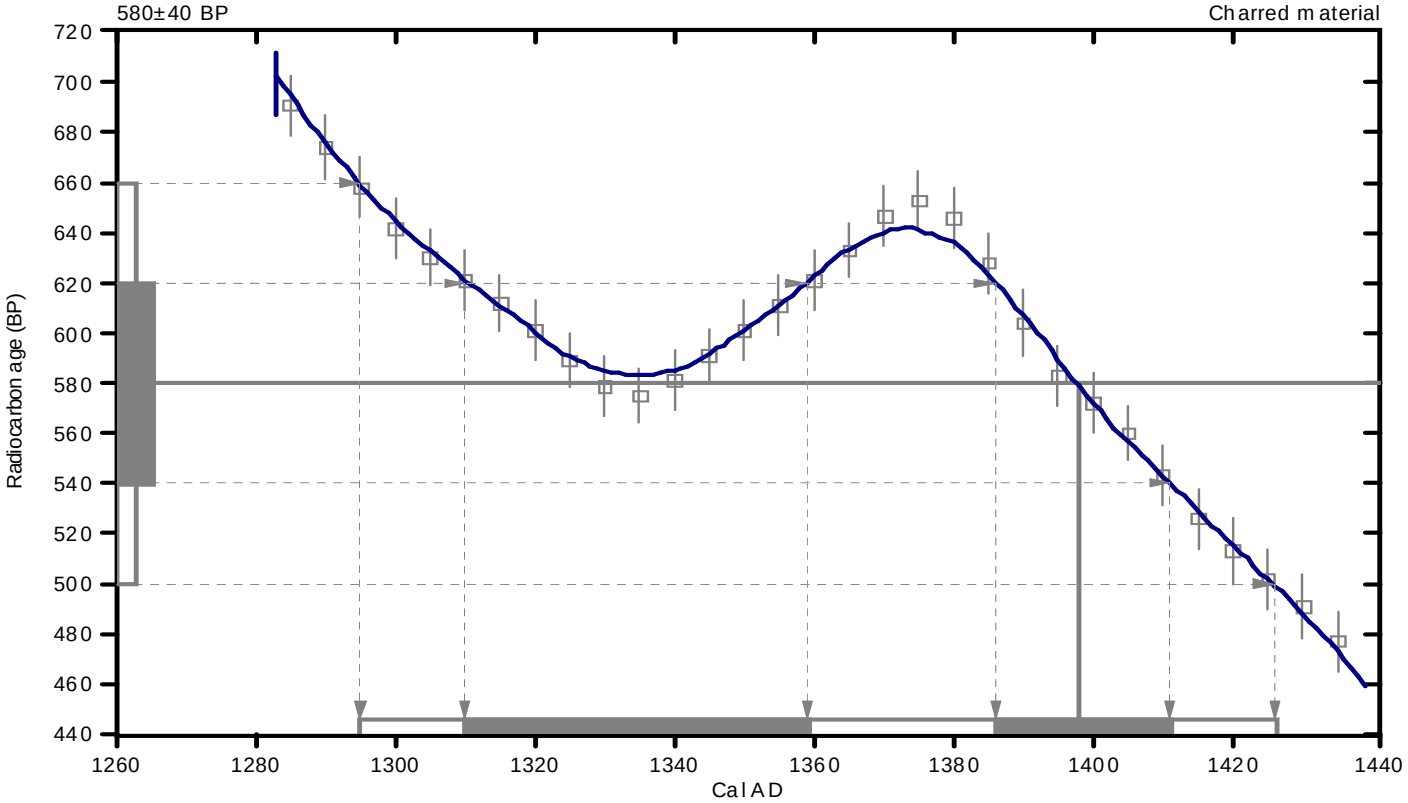
Conventional radiocarbon age: **580±40 BP**

2 Sigma calibrated result: (95% probability) **Cal AD 1300 to 1430 (Cal BP 660 to 520)**

Intercept data

Intercept of radiocarbon age with calibration curve: Cal AD 1400 (Cal BP 550)

1 Sigma calibrated results: (68% probability) Cal AD 1310 to 1360 (Cal BP 640 to 590) and Cal AD 1390 to 1410 (Cal BP 560 to 540)



References:

Database used

INTCAL04

Calibration Database

INTCAL04 Radiocarbon Age Calibration

IntCal04: Calibration Issue of Radiocarbon (Volume 46, nr 3, 2004).

Mathematics

A Simplified Approach to Calibrating C14 Dates

Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2), p317-322

Beta Analytic Radiocarbon Dating Laboratory

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APPENDIX C

Provenience Code for the Elbee Site (32ME408) and the Karishta Site (32ME466), 2010 UND Fieldwork

Table C.1.	Provenience Coding Format.

Table A.1. Provenience Coding Format, Elbee Site (32ME408) and Karishta Site (32ME466), 2010 UND Fieldwork.

Field Name	Code	Description/Code Value
UND-ACN		UND ACCESSION NUMBER
	2010-0001	Elbee (32ME408)
	2010-0002	Karishta (32ME466)
UND-FCN		UND FIELD CATALOG NUMBER
XUN		EXCAVATION UNIT (XU) NUMBER
SQN		SQUARE NUMBER
SCGN		SQUARE COORDINATE GRID NORTH
SCGE		SQUARE COORDINATE GRID EAST
LVN		SQUARE LEVEL NUMBER
DEPTH		SURFACE DEPTH (sd) in cm
RCT		RECOVERY TYPE
	QDS	Quarter-inch dry screen
	SWS	Sixteenth-inch water screen
	FLT	Flotation sample/lab water screen
	CCS	Charcoal sample (radiocarbon dating)
	GSC	General surface collected (unscreened)
	PPS	Point-plotted surface artifact
	PPE	Point-plotted excavated artifact
	UNS	Unscreened
	N/A	Not applicable
	VAR	Variable, see excavation form
PES		PERCENT OF EXCAVATED SAMPLE
	100	100%
	089	89% (8/9 dry screen sample)
	011	11% (1/9 water screen sample)
	N/A	Not applicable (surface collected, point-plotted, etc.)
	VAR	Variable, see excavation form
FTN		FEATURE NUMBER
FTT		FEATURE TYPE
	FORT	Fortification Ditch
	HRTH	Hearth (fire pit or surface fire)
	CPIT	Cache pit (storage pit)
	OPIT	Other pit (roasting, stone boiling, etc.)
	POST	Post
	PSTH	Posthole (Postmold)
	ARTC	Artifact concentration
	ASHD	Ash deposit
	OTHR	Other, unknown, indeterminate

Field Name	Code	Description/Code Value
	RARB	Rodent/animal run/burrow
	CCLS	Charcoal Lens
STRATUM		SOIL HORIZON OR OTHER STRATIGRAPHIC UNIT
	[from profile]	[see profile]
	SUR	Surface collected
	GEN	General (e.g., auger probes)
ACU		ARCHEOLOGICAL CONTEXT UNIT
	PZN	Plowzone
	SPZ	Sub-plowzone
	FTR	Feature
	GLV	General level
	OTR	Other, unknown, indeterminate
	AGP	Auger probe
	SUR	Surface
	MUL	Mixed upper layer
GZN		GEOMORPHOLOGICAL ZONE (PHYSICAL ANALYTIC UNIT)
	A-TR	A terrace
	B-TR	B terrace
CTU (CAU)		CULTURAL-TEMPORAL UNIT BY TERRACE AREA (COMPONENT ANALYTIC UNIT BY TERRACE AREA)
	LPV-A	Late Plains Village, A terrace
	LPV-B	Late Plains Village, B terrace
	MPV-A	Middle Plains Village, A terrace
	MPV-B	Middle Plains Village, B terrace
	NCD	Not Coded
	UKN	Unknown
REMARKS		REMARKS (memo field)

APPENDIX D

Artifact and Other Material Inventory and Quantification Code, Elbee Site (32ME408) and Karishta Site (32ME466), 2010 UND Fieldwork

Table D.1.	Artifact and Other Material Inventory and Quantification Coding Format.

Table D.1. Artifact and Other Material Inventory and Quantification Coding Format, Elbee Site (32ME408) and Karishta Site (32ME466), 2010 UND Fieldwork.

Field	Description
UND-FCN	UND Field Catalog Number
KNRI-LCN	Knife River Indian Villages Lab Catalog Number--NPS Assigned, ICMS Catalog Number
MATCODE	**MATERIAL CLASS CODE**
ASH	Ash (Consolidated)
BB	Burned Bone
BE	Burned Earth
BO	Bone
CSFD	Chipped Stone Flake Debris
EAC	Historic Euro-American Ceramic
EAG	Historic Euro-American Glass
EAM	Historic Euro-American Metal
EAO	Historic Euro-American Other
FB	Floral/Botanical Aggregate
FC	Fired Clay
FCR	Fire-Cracked Rock
FCR-FR	Fire-Cracked Rock/Fractured Rock
IB	Identifiable Bone
IS	Identifiable Shell
MA	Manuport
MB	Modified Bone
MS	Modified Shell
NAGB	Historic Native American Glass Bead
NAO	Historic Native American Other
NAOG	Historic Native American Other Glass
NATM	Historic Native American Trade Metal
NC	Native Ceramics
NCBS	Native Ceramic Body Sherd
NCL	Natural Clinker
NCO	Native Ceramic Other
NCRS	Native Ceramic Rim Sherd
NR	Natural Rock
OMSD	Other Modified Stone Debris
OP	Ochre/Pigment
OTR	Other (describe)
OTR-FR	Other (fractured rock)
SE	Seeds (Burned)
SH	Shell
SS	Soil Sample
ST	Stone Tool
UB	Unidentifiable Bone

UR	Unsorted Residue
US	Unidentifiable Shell
WC	Wood/Charcoal
G1NO	Size Grade 1 Number
G1WT	Size Grade 1 Weight (to 0.1 g)
G2NO	Size Grade 2 Number
G2WT	Size Grade 2 Weight (to 0.1 g)
G3NO	Size Grade 3 Number
G3WT	Size Grade 3 Weight (to 0.1 g)
G4NO	Size Grade 4 Number
G4WT	Size Grade 4 Weight (to 0.1 g)
G5NO	Size Grade 5 Number
G5WT	Size Grade 5 Weight (to 0.1 g)
TLNO	Total Number (G1-5)
TLWT	Total Weight (G1-5; to 0.1 g)
REMARKS	Remarks

APPENDIX E

Native Ceramics Analysis Code, Elbee Site (32ME408) and Karishta Site (32ME466),2010 UND Fieldwork

Table E.1. Native Ceramic Body Sherd Coding Format, Elbee Site (32ME408) and Karishta Site (32ME466), 2010 UND Fieldwork.

Variable	Code	Variable/Code Description
UND-FCN		UND FIELD CATALOG NUMBER
KNRI-LCN		KNRI LAB CATALOG NUMBER, NPS ICMS CATALOG NUMBER
CTU		CULTURAL-TEMPORAL UNIT/COMPONENT ANALYTIC UNIT (from provenience code)
SG		SIZE GRADE
MTHICK		MAXIMUM THICKNESS (mm)
PRIMSURFT		PRIMARY SURFACE TREATMENT, EXTERIOR
	smoo	smoothed (plain)
	burni	burnished (polished, black)
	simpl	simple stamped
	check	check stamped
	cordr	cord roughened
	brush	brushed
	fabri	fabric impressed
	neti	net impressed
	comb	combed
	inde	indeterminate
	cordmf	cord marked fine (narrow and regular)
	simpsf	simple stamped fine (narrow and regular)
SECOSURFT		SECONDARY SURFACE TREATMENT, EXTERIOR
	smoo	smoothed
	burni	burnished
	inde	indeterminate
	(blank)	none; not applicable
	---------	or as indicated under PRIMSURFT
TERTSURFT		TERTIARY SURFACE TREATMENT, EXTERIOR
	smoo	smoothed
	burni	burnished
	inde	indeterminate
	(blank)	none; not applicable
	---------	or as indicated under PRIMSURFT
DECORATION		DECORATION
	as indicated	See rim sherd code
TEMPER		TEMPER
	grit	grit (crushed granitic rock)
	sand	sand
	shell	shell
	grsa	grit and sand
	grsh	grit and shell
	shsa	shell and sand
XCOLOR		EXTERIOR COLOR
	as indicated	as indicated
REMARKS		NOTES/COMMENTS

Table E.2. Native Ceramic Rim Sherd and Vessel Coding Format, Elbee Site (32ME408) and Karishta Site (32ME466), 2010 UND Fieldwork (compiled in part from variables described in Ahler and Swenson 1985a; Anfinson 1979; A. Johnson et al. 1991; C. Johnson 1980, 1996; Michlovic and Swenson 1998).

Field	Code	Meaning or Value
UND-FCN		UND FIELD CATALOG NUMBER—FIRST
UND-FCN-S		UND FIELD CATALOG NUMBER(S)—SECOND
KNRI-LCN		KNRI LAB CATALOG NUMBER, NPS ICMS CATALOG NUMBER—FIRST
KNRI-LCN-S		KNRI LAB CATALOG NUMBER, NPS ICMS CATALOG NUMBER—SECOND
VESN		VESSEL NUMBER
CTU		CULTURAL-TEMPORAL UNIT/COMPONENT ANALYTIC UNIT (from provenience code)
WARE		CERAMIC WARE OR GROUP
		as indicated
TYPE		WARE TYPE
		as indicated
SUBTYPE		TYPE SUBTYPE
		as indicated
RIMFORM		RIM FORM (changed from 02-28-08)
	strait	straight, straight
	strait-o	straight, outcurved
	strait-b	straight, braced
	S-rim	S-shaped rim, S-rim
	S-recur	S-rim, recurved
	incurv	in-curved (bowl)
	roll	rolled (rolled-rim)
	inde	indeterminate
RIMORIEN		RIM ORIENTATION
	evert	everted (flared)
	invert	inverted (S-rims and bowls)
	verti	vertical
	inde	indeterminate
RIMAPPEN		RIM APPENDAGE OR OUTLINE MODIFICATION
	brace	brace
	fillet	fillet
	tab	tab
	node	node
	handle	handle (loop or strap)
	spout	spout
	castel	castellation

Field	Code	Meaning or Value
	wavy	wavy outline from pinching
	(blank)	none
PRIMSURFT		PRIMARY SURFACE TREATMENT, EXTERIOR
	smoo	smoothed (plain)
	burni	burnished (polished, black)
	simpl	simple stamped
	check	check stamped
	cordr	cord roughened
	brush	brushed
	fabri	fabric impressed
	neti	net impressed
	comb	combed
	inde	indeterminate
SECOSURFT		SECONDARY SURFACE TREATMENT, EXTERIOR
	smoo	smoothed
	burni	burnished
	inde	indeterminate
	(blank)	none; not applicable
	---------	or as indicated under PRIMSURFT
XRIMDECOR1		EXTERIOR RIM DECORATION ONE (below the lip)
	cordi	cord impressed (impressed with single cords)
	cordm	cord marked (impressed with multiple cords in linear pattern)
	cordmf	cord marked fine (impressed with multiple fine cords in linear pattern)
	tooli	tool impressed
	fingi	finger impressed
	cwti	cord-wrapped-tool impressed
	trail	trailed (line broader than deep)
	incis	incised (line deeper than broad)
	chan	channeled
	punct	punctated (exterior punctate)
	embos	embossed (interior punctate)
	dents	dentate stamped
	combs	comb stamped
	pinch	pinched
	plain	plain, undecorated
	simpls	simple stamped (as decoration)
	simpsf	simple stamped fine (as decoration)
	stab	stab-and-drag
	stamp	other stamped
XRDMOTIF1		EXTERIOR RIM DECORATION MOTIF ONE
	01	horizontally repetitive (tool or finger impressions, punctates, bosses, etc., no orientation)
	02	horizontally repetitive diagonals
	03	horizontally repetitive perpendiculars
	04	multiple horizontal lines
	05	single continuous line
	06	horizontally repetitive parallels
	10	multiple line triangles

Field	Code	Meaning or Value
	13	multiple horizontal lines with rainbow pattern
	(blank)	none, plain
XRIMDECOR2		EXTERIOR RIM DECORATION TWO (below the lip)
		see XRIMDECOR1
	(blank)	none, plain
XRDMOTIF2		EXTERIOR RIM DECORATION MOTIF TWO
		see XRDMOTIF1
	(blank)	none, plain
LIPDECOR1		LIP AND LIP/RIM JUNCTURE DECORATION ONE
	cordi	cord impressed (impressed with single cords)
	cordm	cord marked (impressed with multiple cords in linear pattern)
	cordmf	cord marked fine (impressed with multiple fine cords in linear pattern)
	tooli	tool impressed
	fingi	finger impressed
	cwti	cord-wrapped-tool impressed
	trail	trailed (line broader than deep)
	incis	incised (line deeper than broad)
	chan	channeled
	punct	punctated (exterior punctate)
	embos	embossed (interior punctate)
	dents	dentate stamped
	combs	comb stamped
	pinch	pinched
	plain	plain, undecorated
	simpls	simple stamped (as decoration)
	simpsf	simple stamped fine (as decoration)
	stab	stab-and-drag
	stamp	other stamped
LDMOTIF1		LIP DECORATION MOTIF ONE
	01	horizontally repetitive (tool or finger impressions, punctates or bosses, no orientation)
	02	horizontally repetitive diagonals
	03	horizontally repetitive perpendiculars
	04	multiple horizontal lines
	05	single continuous line
	06	horizontally repetitive parallels
	10	multiple line triangles
	(blank)	none, not applicable
LIPDECOR2		LIP AND LIP/RIM JUNCTURE DECORATION TWO
		see LIPDECOR1
	(blank)	none, plain
LDMOTIF2		LIP DECORATION MOTIF TWO
		see LDMOTIF1
	(blank)	none, not applicable

Field	Code	Meaning or Value
LIPFORM		LIP FORM
	round	rounded
	flat	flat
	bevi	beveled in
	bevo	beveled out
	l-sh	L-shaped
	t-sh	T-shaped
	peak	peaked (pointed)
	beadi	beaded in
	beado	beaded out
	rolled	rolled (out)
	notch	notched lip (e.g., Sandy Lake)
	n/a	not applicable, no lip
SHODECOR1		SHOULDER DECORATION ONE
	cordi	cord impressed (impressed with single cords)
	cordm	cord marked (impressed with multiple cords in linear pattern)
	cordmf	cord marked fine (impressed with multiple fine cords in linear pattern)
	tooli	tool impressed
	fingi	finger impressed
	cwti	cord-wrapped-tool impressed
	trail	trailed (line broader than deep)
	incis	incised (line deeper than broad)
	chan	channeled
	punct	punctated (exterior punctate)
	embos	embossed (interior punctate)
	dents	dentate stamped
	combs	comb stamped
	pinch	pinched
	plain	plain, undecorated
	simpls	simple stamped (as decoration)
	simpsf	simple stamped fine (as decoration)
	stab	stab-and-drag
	stamp	other stamped
	n/a	not applicable, no shoulder present
SDMOTIF1		SHOULDER DECORATION MOTIF ONE
	01	horizontally repetitive (tool or finger impressions, punctates or bosses, no orientation)
	02	horizontally repetitive diagonals
	03	horizontally repetitive perpendiculars
	04	multiple horizontal lines
	05	single continuous line
	06	horizontally repetitive parallels
	10	multiple line triangles
	(blank)	none, not applicable
SHODECOR2		SHOULDER DECORATION TWO
		see SHODECOR1
	(blank)	none, not applicable

Field	Code	Meaning or Value
SDMOTIF2		SHOULDER DECORATION MOTIF TWO
		see SDMOTIF1
	(blank)	none, not applicable
PASTE		PASTE (clay body with temper)
	poro	porous (voids considerable)
	mcomp	medium compact (voids common)
	comp	compact (voids few and small)
	platy	platy (platy structure in clay body considerable)
TEMPER		TEMPER
	grit	grit (crushed granitic rock)
	sand	sand
	shell	shell
	grsa	grit and sand (grit predominant)
	grsh	grit and shell (grit predominant)
	shsa	shell and sand (shell predominant)
	shgr	shell and grit (shell predominant)
XCOLOR		EXTERIOR COLOR
	black	black
	gray	gray
	brown	brown
	tan	tan (light yellowish brown)
	buff	buff (moderate orange yellow, light to moderate yellow)
ODIAM		ORIFICE DIAMETER (cm)
	0	indeterminate, too small for measurement
MAXTH		MAXIMUM WALL THICKNESS (mm)
	0	indeterminate; split
MINTH		MINIMUM WALL THICKNESS (mm)
	0	indeterminate; split
WEIGHT		in grams
REMARKS		NOTES/COMMENTS

APPENDIX F

Stone Tool Analysis Code, Elbee Site (32ME408) and Karishta Site (32ME466), 2010 UND Fieldwork

Table F.1.	Stone Tool Coding Format.

Table F.1. Stone Tool Coding Format, Elbee Site (32ME408) and Karishta Site (32ME466), 2010 UND Fieldwork (abstracted and adapted from Ahler and Swenson 1985b; Root et al. 1999).

Variable	Code	Variable/Code Description
UND-FCN		UND FIELD CATALOG NUMBER (Provenience Key)
KNRI-LCN		KNRI LAB CATALOG NUMBER, NPS ICMS CATALOG NUMBER
DC		DESCRIPTIVE CATEGORY
	01	patterned triangular bifaces
	03	patterned notched bifaces
	08	pointed and ovoid bifaces
	09	patterned biface fragments
	14	unpatterned bifaces, nonbipolar cores, and core-tools
	15	end scrapers
	19	marginally retouched tablular pieces (retouched plate)
	24	acutely pointed flake tools
	29	other retouched and modified flakes
	30	bipolar cores/tools
	34	unpatterned pecked/ground tools
	37	linearly grooved tools, complete and incomplete
	38	grooved mauls
	39	patterned complex ground stone
	98	FCR tools
	99	indeterminate burned and fragmented—not coded
CPNO		COMPUTER NUMBER (sequential in each descriptive category)
TC		TECHNOLOGICAL CLASS
	01	patterned small thin bifaces
	02	patterned large thin bifaces
	03	unpatterned irregular bifaces
	04	patterned flake tools
	05	unpatterned flake tools
	06	unpatterned thick bifacial core tools
	07	unpatterned nonbipolar cores/tools
	08	unpatterned bipolar cores/tools
	09	unpatterned pecked/ground/cobble tools
	10	patterned pecked/ground tools
	98	FCR tools
MC		MORPHOLOGICAL CLASS
	00	anomalous point form/type indeterminate
	01	small unnotched triangular arrow point (type unnamed or unspecified)
	02	small side-notched arrow point (type indeterminate)
	03	Plains Side-Notched type (arrow point)
	04	Prairie Side-Notched type (arrow point)
	05	Avonlea type (side/corner-notched arrow point)
	10	Besant type (side-notched dart point)
	11	Pelican Lake type (corner-notched dart point)
	13	Besant/Pelican Lake base fragment
	31	ovoid unpointed/roughly ovoid
	32	ovoid pointed

Variable	Code	Variable/Code Description
	34	general triangular
	36	pointed fragment
	37	irregular
	38	edge fragment or segment (patterned biface)
	39	ovoid fragment
	41	bilaterally symmetrical (end scrapers here)
	44	flake with one edge
	45	flake with two edges
	46	flake with three edges
	50	patterned (complexly shaped) ground stone
	88	square-rectangular patterned uniface tools (gunflints)
FC		FUNCTIONAL CLASS
	01	projectile points
	02	perforators
	03	bilateral cutting tools used on soft materials, short duration
	04	transverse edged cutting tool
	06	light duty transverse scrapers used on soft materials
	07	bilateral cutting tools used on soft materials, long duration
	08	expedient cutting tools
	09	heavy duty sawing and tearing tools
	10	unilateral cutting tools, soft materials
	12	cutting tools used on hard materials
	14	choppers or pounding tools
	15	bifacial cutting tools, not further specified
	16	transverse scrapers used on abrasive materials
	17	transverse scrapers used on hard materials
	19	slotting or grooving tools (burins)
	20	transverse scraping tools, not further specified
	21	cores
	22	utilized flakes used on hard materials
	23	retouched or utilized flakes, various worked materials
	25	indeterminate bipolar cores or wedges (core/punch/wedge/chisel)
	26	punch/wedge/chisel
	28	anvils or bipolar hammers
	29	hammerstones
	31	tested raw materials
	33	simple hand-held abrading tool
	35	handstones (manos)
	36	grinding slabs or milling stones
	37	burnishing tools
	40	manuports
	43	gunflints
	44	patterned bifacial tools, unknown function
	58	notched flakes
	99	indeterminate, unknown
UL		USE-LIFE (USE-PHASE) CLASS
	1	unfinished, unbroken, usable
	2	unfinished, broken or rejected
	3	finished, unbroken, usable
	4	finished, broken or rejected

Variable	Code	Variable/Code Description
RM		RAW MATERIAL TYPE
	01	smooth gray Tongue River (Rhame bed) silcrete (silicified sediment)
	02	coarse gray Tongue River (Rhame bed) silcrete (silicified sediment)
	03	coarse red Tongue River (Rhame bed) silcrete (silicified sediment)
	04	orthoquartzite, fine to medium grained (solid quartzite)
	05	Swan River chert (porous quartzite)
	06	chert/jasper
	08	clear/gray chalcedony
	09	yellow/light brown chalcedony
	10	dark brown chalcedony
	13	basaltic materials
	14	other, unclassified, indeterminate
	15	Ogallala orthoquartzite (Bijou Hills silicified sediment)
	16	quartz
	17	porcellanite
	18	obsidian
	19	granitic materials
	21	sandstone, fine to medium grained
	23	clinker (natural)
	24	red pipestone (catlinite)
	28	Knife River flint (unburned and burned)
	32	English flint
	35	metaquartzite (other quartzite)
	36	scoria
	37	siltstone, mudstone, or limestone
	40	non-volcanic natural glass (NVNG)
BR		BURNING
	0	absent
	1	present
	9	indeterminate
HT		HEAT TREATMENT (non-volcanic stones)
	0	unheated
	1	possibly heated
	2	heat treatment certain
	9	indeterminate or not applicable (volcanic stones)
PI		PATINATION INTENSITY (chalcedonies and flints)
	0	absent (unpatinated)
	1	light patination
	2	moderate patination
	3	heavy (pronounced) patination
	9	indeterminate or not applicable (non-patinable stones)
RC		RECYCLED
	0	absent
	1	second function present, recycled from contemporary item/use
	2	second function present, not recycled from contemporary item/use

Variable	Code	Variable/Code Description
MP		MULTIPURPOSE
	0	single function tool
	1	double function tool
	2	triple function tool
	3	quadruple function tool
	9	indeterminate
CX		CORTEX
	0	0-100%; each face a maximum of 50%
CM		COMPLETENESS
	1	complete
	2	nearly complete
	3	distal end
	4	proximal end
	5	medial fragment
	6	indeterminate end
	7	margin or corner fragment
WT		WEIGHT (recorded to 0.1 g)
NOTES		REMARKS