2023

Fox Lake – Havanoid Interaction: An Analysis of Eleanor Site Pottery

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By

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A Thesis Submitted in Partial Fulfillment of the

Requirements for the Degree of

Master of Science

In

Applied Anthropology

Minnesota State University, Mankato

Mankato, Minnesota

July 2023

July 10, 2023

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Abstract

Through the analysis of pottery remains found at the Eleanor archeological site, the study investigates the relationship between the Fox Lake culture and the Havanoid phases. The relationship between the Fox Lake complex of the southwestern prairie area and the Havanoid phases of the eastern woodlands is poorly understood in southern Minnesota. Despite its potential to provide information about this relationship, the Eleanor site (21NL30) collection was never thoroughly studied after the excavation.

Richard Strachan conducted excavations at the Eleanor site between 1976 and 1978. A total of 124 pottery sherds were examined, with 76 being rim sherds and the remaining 48 being body sherds. The analysis particularly focused on attribute categories such as manufacturing techniques, morphological characteristics, and decorative features of the pottery.

The analysis of the pottery specimens identified indicates that the Fox Lake pottery samples were presumably made locally. The fact that all the identified Fox Lake pottery specimens are Vertical Cordmarked type suggests this. The variety of Havanoid pottery samples and the geographical range covered by the types, on the other hand, convey that they likely came to Eleanor as a result of trade or exchange. The Eleanor samples do not show the influence of Havanoid elements discussed in the archaeological literature at Fox Lake. The mixing of layers caused by intensive agricultural activity makes it impossible to determine the chronological relationship.

To determine the chronology in future studies, accurate periodization methods need to be applied. The combination of faunal, botanical, and lithic analysis can improve the initial understanding of the site and the Fox Lake-Havanoid interaction traces in it.

CHAPTER 1: INTRODUCTION

Problem Statement

Contrary to popular belief, archeology is not a science concerned with the descriptive, static analysis of material objects, but rather with the living, dynamic culture that existed at the time that materiality carries. Anthropology (as well archeology) usually approaches cultural processes by considering culture as a system, typically structured after an ecological system, in which modifications in its components have an important impact in both preserving the system in general and, on occasion, causing considerable change (Anfinson 1987:5).

Minnesota has three major biotic zones: prairie, deciduous forest, and mixed coniferous deciduous forest, which generally correspond to surrounding states' biotic ecosystems. Because plant communities reflect regional climatic patterns and since some animal species are better adapted to certain plant communities than others, biotic provinces are associations of climate, plant, and animal communities. The changing climate of Minnesota has caused changes in the distribution of plants and animals within the state, as well as changes in the food energy resources available to hunters and gatherers (Gibbon 2012).

Minnesota's territory is categorized into nine archeological regions based on geographical, biotic, hydrographic, and archeological factors. This regional framework is beneficial not only for managing cultural resources but also for comprehending prehistoric lifestyles and studying cultural processes.

Archeological region borders do not always confine cultures, but rather the constraints of resources that cultures exploited in a specific way. Because these resources may change over time, the region and its boundaries will remain intact as long as the resources are significantly different from one another (Anfinson 1990).

Throughout Minnesota's 12,000-year cultural history, environmental changes forced communities to adapt to new conditions or migrate to areas with a suitable ecosystem. Both adaptation and migration leave an imprint on the archeological record. Sites between the geographical, biological, and biotic regions as Eleanor (21NL30) are more sensitive to environmental change and are suitable for investigation of the interaction between regions and cultures (Map 1).

Although the distribution of available resources within every region varied over time and from season to season, archeological regions appear to have demonstrated significant internal coherence in terms of the natural setting and, in some extent, cultural variation, particularly during the Woodland period.

Most of the Woodland sites in Minnesota are multi-component, with little differentiation between components resulting in the coexistence of several occupations (Arzigian 2008:12). Hence, the totality of material culture and other characteristics of many Woodland complexes cannot be reliably distingushed, complexes have been established and characterized mostly on the basis of

specific traits or diagnostic artifacts, most frequently pottery (Arzigian 2008:12).

Middle Woodland and Initial Woodland cultural complexes in southern Minnesota are primarily distributed in accordance with the state's main biotic divisions. These complexes comprise Middle Woodland Havana-like Howard Lake and Sorg phases in the biotic province of mixed deciduous forests in the state's southeastern portion, and Initial Woodland Fox Lake complex in the prairie grasslands in the states southwest (Gibbon and Caine 1980:58). The relationship between the Initial Woodland Fox Lake complex of the southwestern prairie area and the Middle Woodland Havana-like phases of the eastern woodlands is poorly understood despite being contemporaneous and developing on the basis of different ecozones in neighboring geographical settings in southern Minnesota (Hudak 1976; Buhta et al. 2014).

Eleanor Site (21NL30)

Richard Strachan, a former anthropology professor at Minnesota State University, Mankato, began excavating an archeological site called Eleanor (21NL30) on the south bank of Swan Lake in Nicollet County in 1976. From 1976 to 1978, Strachan supervised three summer field schools at the site. The field schools constituted an integral component of a comprehensive survey carried out by Strachan during the period spanning from the mid-1970s to the mid-1980s, focusing on the Swan Lake and Middle Lake region. Although there

is no complete report on the site, there is ample indication of its significance. The excavation may have revealed 18 to 20 oval-shaped houses with basin floors at the Eleanor site. The assemblage of artifacts recovered from the site includes lithic debitage, scrapers, projectile points, celts, hoes, hammerstones, and mammal bones. The pottery recovered from the archeological site, exhibits a variety of characteristics. These include both smooth-surfaced and cord-marked sherds, some of which display decorative elements such as rows of dentates or punctates. Furthermore, the pottery is primarily composed of grit-tempered materials (Anderson 2018:30). Strachan connects the site to the Middle Woodland period's Havana-like complex (Gibbon and Caine 1980) while Scott Anfinson refers to Eleanor as the Initial Woodland Fox Lake phase site (Anfinson 1979). The site's wealth and diversity of pottery, lithic, and organic material indicate the site's use by numerous groups and suggest significant cultural contact or stratigraphic relationship between different phases. Located between the tallgrass prairie and deciduous forest biotic regions (Gibbon 2012) and in the Prairie Lake North archeological resource region (Buhta et all 2014), the Eleanor site may contribute to clarifying the relations between cultural phases in southern Minnesota.

Research Questions

Current research tested the assertion that the complexity and richness of the Eleanor site pottery styles represent interactions with the Fox Lake and

Havana-like cultural phases from neighboring archeological resource regions. Although sources mention the possibility of both the abovementioned archeological cultures being present at Eleanor, no formal analyses provide solid data about it. Because pottery styles are a primary tool for distinguishing between these cultural taxa, diagnostic pottery from the Eleanor excavation stored in the Laboratory of the Minnesota State University Mankato was analyzed to answer the following questions: what types of pottery are present at the site? is there Fox Lake and Havanoid pottery at Eleanor? what similarities and differences does Eleanor pottery share with other examples of identified types from neighboring regions? how does that exhibit relationships between Fox Lake and Havana-like cultural phases? what were the cultural relationships of the site's inhabitants like in relation to the larger geographical context?

CHAPTER 2: BACKGROUND

The Eleanor Site Location

Eleanor is one of several dozen sites identified on the shores and islands of Swan Lake, Nicollet County, Minnesota. The site is located in the South Bay region of Swan Lake, on a slender peninsula that extends inland from the lake's southwest side (Map 3). The site, designated as 21NL30, is situated on a series of elevated landforms that intermittently connect, resulting in a fragmented peninsula extending into Swan Lake from the southern and western directions. The elevations of the hills that constitute the peninsula range from approximately three to ten meters above the waterline (Anderson 2018:29). Besides Eleanor, five other sites were reported on the peninsula (21NL0025, 21NL0026, 21NL0029, 21NL0031, and 21NL0032). A short and narrow strait connects the peninsula to the mainland, and marshes surround it on all sides. Presumably, the peninsula became an island at different periods of time depending on lake level fluctuations.

The Eleanor site is in a typical Prairie Lake archeological region Woodland settlement location, which is a general lakeshore position near the river (Anfinson 1990:155-156). Such site locations were beneficial for taking advantage of the numerous and diverse resources available in the neighboring prairie, forest, and lacustrine ecosystems. The site is about 20 kilometers west of a modern forest-prairie division in south-central Minnesota. The closest distance from the site to the Minnesota River is 6 km.

In south-central Minnesota, the current (1850s) prairie-forest boundary formed around 3500-3000 BP (Baker, et al. 2002:121). The Late Holocene period, spanning from 2500 BP to the present, signifies the onset of a contemporary climate and the establishment of a distinct pattern of vegetation distribution throughout the region (Gibbon 2012:30). Paleoenvironmental simulations of the region show that the prairie-forest boundary area was a mixture of prairie, oak savanna, and fewer areas of hardwood forest predominant in northern deciduous forest species (Grimm 1983).

The region was once home to six eco-zones: dry and wet prairie, big woods, river bottom forest, aspen-oak land, and oak openings and barrens. The General Land Office (GLO) survey maps from 1855 show that the area of interest was positioned amid a mosaic of prairie and woodland vegetation during the early phase of Euro-American settlement (Mollerud 2016:11).

The Middle Woodland period was a time of significant change and transformation in the American Midwest. However, Native Americans in Minnesota had their own unique experience of adaptation and artifacts styles throughout this period (Gibbon 2012:93). The change and differences in ceramic style is a particularly clear example of this adaptation.

Access to reliable food sources is critical in seasonally migrating hunters and foragers. It is necessary to have a diverse environment in order to quick transition from one food resource use to another. In the event that prairie resources are inaccessible, it is possible to fill the gap in the food ration by using

resources found in water bodies and wetlands. It is very likely that the abundance of plants and animals native to wetland areas, prairie, and forest as well as fish and marine invertebrate resources, influenced the location of such settlements. Such settings would also have offered communities protection from enemies and prairie wildfires (Anfinson 1997:45).

Large mammals such as bison, white-tailed deer, elk, and black bear would have been available in a mixed prairie-forest environment. Smaller terrestrial and aquatic mammals and birds, such as fox, beaver, muskrat, duck, and geese, would also have been available (Anfinson 1990:147). Furthermore, access to riverine resources such as fish, mussels, turtles, and reptiles would have been provided by the nearby Minnesota River and Swan Lake itself (Anfinson 1990:147).

Since the Eleanor site is near the border of two biotic regions, it is necessary to consider the natural-geographical and archeological characteristics of both the Prairie Lake Archeological region and the Southeast Riverine Archeological region.

Prairie Lake Archeological Region

The Prairie Lake region encompasses most of southwestern and south-central Minnesota (Map 2). The region spans northeastern South Dakota and north-central Iowa. The environment is dominated by tallgrass grassland. The

most noteworthy topographic feature of the region is the Minnesota River, which flows from west to east and splits the prairie. Many of the major rivers, like the Minnesota River, follow the course of previous glacial meltwater channels. All of the streams and rivers ultimately merge to form the Mississippi River. Bedrock outcrops, particularly deposits of high-quality tool stone, are uncommon in the Prairie Lake region. However, in the western part of the region, there are numerous Sioux Quartzite outcrops. The topography of the central Prairie Lake region is typical ground moraine swell and swale topography. Its northern, eastern, and southern margins are characterized by hilly end moraines (Gibbon 2012:28).

In the major river basins, there are narrow river bottom forests and oak woods, as well as small spots of wood in fire-protected places adjacent to large lakes. The eastern part of the region, which was transitioning from prairie to woodland, had more widespread forest growth. Bison were the major upland animal in the Prairie Lake region throughout the Woodland period, with big elk herds appearing infrequently. White-tailed deer have been spotted in the Minnesota River Valley and the eastern Woodland edge. Many shallow lakes in the area support large populations of aquatic animals, birds, fish, and a diverse floral array, including edible plants (Anfinson 1990:147). Main Woodland ceramic types associated with the region are Initial Woodland Fox Lake and Terminal Woodland Lake Benton.

Southeast Riverine Archeological Region

The Southeast Riverine Archeological Region in Minnesota is where Havana, Hopewell influence is most frequently encountered (Map 2). This region, unlike the Prairie Lake Region, has no glacial lakes and its stream-dissected topography was relatively less glaciated during the Pleistocene Ice Age. Because of its relatively mild climate and wide bottomlands, the region is better suited for horticulture than any other region in Minnesota (Gibbon 2012:29). Located east of the prairie-forest boundary zone, the region is covered with elm, ash, cottonwood, maple, and basswood forests. The western section of the region had patches of oak woods dispersed throughout it, while the center part has more open prairie (Bradley 2009:17).

The Southeast Riverine Region has numerous rock outcrops with rare deposits of high-quality flaking debris. One of the examples of high-quality material in the area is the Grand Meadow Quarry in the southwestern part of the region. The principal subsistence resources during the Woodland period were deer, elk, and scattered bison in the uplands and aquatic animals and plants in the fertile bottomlands (Anfinson 1990:147). The region's Woodland ceramics contain Early Woodland, Havanoid, and Effigy Mound types (Anfinson 1990: 157).

Middle Woodland and Initial Woodland

The emergence of pottery, the appearance of a new Woodland lifeway based on significant shifts in settlement-subsistence practices, and burial ceremonialism are all indicators of the Minnesota Woodland period (Gibbon 1986:89). As a result of the bow and arrow, even smaller forms of the corner and side-notched projectile points evolved. All these modifications enabled more intensive resource utilization and a more sedentary lifestyle in the region during the Woodland period. Rather than relocating to new places to take advantage of seasonal resources, populations settled in one place over extended periods and utilized local resources.

Except for a small portion of the state in the southeast (Southeast Riverine Archeological Region), the traditional Early, Middle, and Late Woodland concept for the Eastern and Southern Midwest does not work for Minnesota. Because this division was based primarily on Ohio Valley cultural history, and most parts of Minnesota are very slightly affected by Ohio Valley cultures, archeologists proposed more accurate Woodland terminology for the state beginning in the late 1980s (Anfinson 1987; Gibbon 2012:93). The cultural phases observed in the southern region of the state, which can be dated back to the Middle Woodland period, have been provisionally linked to the two primary physiographic and biotic provinces present in this locality. The variances observed in ceramic and lithic collections are believed to signify corresponding variations in cultural strategies developed in response to the diverse environmental circumstances (Gibbon and Caine 1980:59).

The main differences between Woodland development in Minnesota and Eastern Woodland are the lack of certain ceramic and lithic attributes, the absence of well-defined Hopewell influences, the lack of horticulture, and perhaps the relatively late appearance of burial mounds. In other words, the initial appearance of ceramic vessels simply marks the beginning of the Woodland tradition in Minnesota. The new technological development (appearance of pottery) does not correspond with the development of new lifeways, but rather with the continuation of food resource practices begun in the earlier period in a more intensive way (Anfinson 1997:47; Gibbon 2012:93). Therefore, based primarily on changes in ceramics styles, the Woodland Period in Minnesota divided into two phases: Initial Woodland and Terminal Woodland.

In southwestern and south-central Minnesota, the Initial Woodland period was characterized by the Fox Lake phase after the initial appearance of La Moille Thick ceramics (Bonney 1970:303; Gibbon 1986:84; Hudak and Johnson 1975:1-5).

For the southeast part of the state, where geographically, naturally, and culturally close to Havana-Hopewell heartland an additional periodization scheme is proposed. In southeastern Minnesota, the archeological record of the Initial Woodland is divided into three periods: Early Woodland (2500-2200 BP), Havana-related Middle Woodland (2200 – 1800 BP), and Late Middle Woodland (1800-1500 BP) (Gibbon 2012:94).

Howard Lake and Sorg have been identified as Havana-related Middle Woodland period phases in southeastern Minnesota.

Fox Lake Phase

First Lloyd Wilford proposed a single Woodland complex based on the materials recovered from the Fox Lake site in 1935 for the entire southern part of Minnesota, including the southeast (Wilford 1941:247). Following thorough material analysis, even more, distinct archeological complexes were identified for southwestern and southeastern Minnesota (Anfinson 1997:47). The definition of the Fox Lake Phase is based primarily on the findings from the investigations of the Fox Lake, Pedersen, and Arthur sites.

Fox Lake phase inhabitants experienced the Prairie Lake region's early adoption of pottery. Despite this, the first appearance of pottery in the Fox Lake phase coincided with the Middle Woodland cultures to the south and east. In contrast to typical Minnesota Woodland complexes, Fox Lake appears to have exhibited a distinct orientation towards the eastern Plains region, as opposed to the more common Midwest orientation observed in archeological complexes. The complex exhibits Plains adaptation, with bison utilization complemented by exploitation of lacustrine and riverine elements (Arzigian 2008:63). The principal Fox Lake sites are located on islands and peninsulas in southwestern Minnesota's shallow lakes. It is likely that these locations were inhabited during the spring, summer and fall seasons. During winters, inhabitants moved to sheltered river valleys or wooded areas. In general, lithics are composed of till sources that are available in the local area. Bison, fish, and small mammals

were heavily utilized since they were readily available in the natural environment. There is no evidence of either horticulture or burial site associations with the Fox Lake phase (Anfinson 1979:79). The identification of traits associated with Fox Lake complex assemblages has proven challenging due to the prevalence of component mixing within archeological sites, with the exception of their recognized ceramics (Gibbon 2012:102).

Havanoid Phases – Howard Lake and Sorg

Abrupt developments in culture in the central Illinois valley led to early Havana sites and artifact assemblages around 2200 to 2150 BP, followed by extensive mound building and participation in Hopewellian mortuary rituals around 2100 to 2000 BP. Deer, fish, mussels, and migratory waterfowl populations were heavily exploited by Middle Woodland Havana culture inhabitants. Communities may have also practiced an early form of horticulture by choosing edible plant seeds for cultivation (Farnsworth 2009:8).

Howard Lake and Sorg are two poorly understood Havana-related Middle Woodland phases that are primarily concentrated near wet prairies and lakes in southern Anoka County and around Spring Lake along the Mississippi River, respectively. They are the northernmost geographical varieties of Havana Hopewell and, which are associated with the "Hopewell Interaction Sphere," with Havana influences or links visible in ceramic, lithic, burial, and subsistence-settlement features (Arzigian 2008:35).

The Carolinian biotic province encompasses various archeological complexes in southeastern Minnesota, which are distinguished by the presence of southern hardwood forests, oak savannas, and true prairies. These complexes exhibit notable similarities to Havana-like assemblages. The spatial distribution of these components implies that they are indicative of cultural adaptations to significant riverine environments. Both of these phases represent only a subset of the classic Havana-Hopewel tradition, with a focus on ceramics. The diagnostic lithic features are either absent or underrepresented, and there is technological continuity with earlier lithic assemblages. Havanoid influence decreases from south to north and only a few Northern Plains and Havana-related features have been added to local tradition in Minnesota and Wisconsin region (Mason 1990:28).

Unlike the Fox Lake and Sorg phases, the Howard Lake complex has classic Havana-Hopewell type burial mounds. They are conical in shape and vary by diameter and height (up to 30 feet). Primary extended burial is the most common type of burial in the larger mounds, but cremation and secondary bundle burials also occur. Large mounds almost always possess some Havana-Hopewell burial items.

Classic Howard Lake phase sites in Minnesota include the Anderson (21AN8) habitation site, Howard Lake mound site (21AN1), and Indian Mounds Park site (21RA10).

A gradual transition and continuity can be observed in southeastern Minnesota between Havana-related Middle Woodland and Late Middle

Woodland complexes, especially when considering the design of ceramic vessels and projectile points (Gibbon 2012:96-99).

Fox Lake Pottery

Pottery serves as the primary diagnostic artifact for Fox Lake sites. Fox Lake pottery is highly comparable to Illinois Valley Early Woodland pre-Havana Black Sand pottery vessels, implying a chronological and cultural continuity that persisted throughout all Initial Woodland period in Minnesota (Gibbon and Caine 1980: 59). The Fox Lake pottery may be linked to trailed-over-cordmarked sand tempered Black Sand and some other incised-over-cordmarked ceramics from the Midwest, but there is little evidence of involvement in larger Woodland contact networks like Hopewell (Anfinson, Wright 1990:219; Hudak 1976:2; Arzigian 2008:63).

The ceramics of the Fox Lake phase exhibit several distinctive features. These include the presence of moderately to small-sized conoidal to subconoidal vessels, which are distinguished by bold exterior cordmarking. Typically, this cordmarking is oriented vertically, although occasionally it may be oblique or horizontally oriented. In the case of horizontally cordmarked vessels, it is common to find partial smoothing, while a few Fox Lake rims display entire smoothing. The walls of the vessel exhibit a notable thickness, ranging from 6 to 12 millimeters, and the paste used in its construction is tempered with sand. Lips are either a rounded or flat shape, with the rims having

the capacity to exhibit a slight inversion or eversion. Approximately 66% of the vessels exhibit exterior rim decorative elements including trailing, bossing, punctuating, and dentate or cordwrapped stick stamping. These ornamental features have the possibility to manifest individually or in conjunction with one another. The interior may have decoration with a series of vertically oriented impressions, resembling short tools or cord-wrapped sticks, arranged in a single band located directly below the lip. The application of occasional lip adornment using tools or sticks wrapped in a cord can result in the lip acquiring a notched visual characteristic (Arzigian 2008:66).

Anfinson (1979; 1997) has classified five distinct pottery types in Fox Lake, drawing upon Hudak's initial categorization of five pottery series (Hudak 1976):

Fox Lake Trailed. Thick-walled, conoidal containers with cordmarked bodies and trailed lines on the rim, frequently with bosses and internal cordwrapped stick imprints. This category encompasses Hudak’s Series B rims (Anfinson 1979:80; Hudak 1976:4). Anfinson distinguishes two types: Wide Line trailing and Narrow Line trailing. The Wide Line variation has greater than 2 mm wide trailing lines, commonly in horizontal bands with tool-impressed lips. Bosses are common, punctates appear on occasion, and internal ornamentation is uncommon. The lips might be round or flat. Lines in the Narrow Line type are up to 2 mm wide and are frequently arranged in complex patterns with horizontal, vertical, and oblique orientations. This variant features few punctates and bosses, only infrequent internal ornamentation (typically

cordwrapped stick imprints), and no lip decoration (occasional cordmarking). Lips are nearly always flat (Anfinson 1979:80; Arzigian 2008:66).

The Fox Lake Trailed pottery exhibits a further categorization, namely Early, Middle, and Late, which is determined by the characteristics of wall thickness and decorative elements.

The early examples exhibit broad incised lines, measuring an average of 2.9 mm, as well as prominent deep cuts on the rims or shoulders, accompanied by bosses and notches on the lip.

The Middle variety exhibits narrower lines, with an average width of 1.7 mm. These lines are organized in parallel horizontal and oblique designs, such as crisscross or filled-in triangles. Additionally, the Middle variety incorporates various decorative elements, including bosses, punctuates, lip notching, and interior cordwrapped stick impressions.

The Late variation has thinner lines, with an average width of 1.5 mm. These lines are organized in intricate patterns, including filled-in triangles, and occasionally incorporate punctates (Anfinson 1997:60).

Overall trends can be observed from the Early to Late stages, characterized by thinner walls, reduced bold cordmarking, partly smoothed exteriors, finer paste, and a more curved rim profile. However, it is important to note that there is limited stratigraphic or radiocarbon evidence to support this hypothesis (Arzigian 2008:67).

Fox Lake Vertical Cordmarked. Conoidal thick-walled containers with infrequently punctate, boss, or inner cordwrapped stick impressions below the lip. Hudak's Series C rims are included in this category (Anfinson 1979:80; Hudak 1976:6; Hudak 1978:30-31).

Fox Lake Horizontal Cordmarked. This type includes Hudak's Series D rims (Anfinson 1979:80; Hudak 1976:7), consisting of thick-walled, conoidal containers with horizontal cordmarked bodies that are frequently undecorated and occasionally partially smoothed. They may also feature exterior punctates or cordwrapped tool impressions, but seldom have trails. Anfinson indicates that horizontal cordmarking appears to be stratigraphically late in the Fox Lake complex at the Pedersen site. Also, at the Mountain Lake site horizontal cordmarking linked another late Fox Lake characteristic of exterior cordwrapped stick impressions (Anfinson 1997:61).

The Fox Lake Smooth. This type exhibits a rim and upper shoulder that are entirely smooth. The decoration of rims is a prevalent practice, often involving the incorporation of bosses, punctates, and sporadic applications of cordwrapped sticks or dentate stamping.

The Fox Lake Cordwrapped Stick. Exhibits horizontal cordmarking, characterized by the presence of exterior horizontal rows of cordwrapped stick impressions and angular punctates. According to Anfinson (1997:62), there is a requirement for an expanded definition that encompasses vertical

cordmarked surfaces, smoothing techniques, and increased decorative variation.

Havanoid Pottery

The primary distinguishing characteristics of both Howard Lake and Sorg phases include the presence of wide-mouth jars with thick vessel walls measuring between 6 to 12 millimeters. These jars exhibit straight rims, slightly constricted necks, somewhat rounded shoulders, and subconoidal bottoms that bear resemblance to decorated pottery found in Havana-Hopewell complexes in Illinois. The prevalent forms of Havanoid pottery found in the Howard Lake and Sorg ceramic assemblages consist of regional versions of Naples Stamped, which is a type of decorated Havanoid ware. The type most frequently observed in these samples from Naples Stamped is characterized by dentate features, including straight dentate stamps, ovoid stamps, trailed lines, bosses, and inwardly beveled lips. There are also fewer instances of the cord-wrapped stick type of Naples Stamped (Gibbon 2012:96).

Several common decorative techniques can be observed in Havana-related ceramics. These include the presence of lip forms, which can be either round or inslanting. Additionally, these ceramics tend to have relatively thick walls. Another characteristic feature is the presence of punctates or bosses located below the lip. Furthermore, trailed or incised lines can be found on both the exterior and lip of these ceramics (Arzigian 2008:41).

In Anfinson’s description, Howard Lake ceramics are grit tempered, with a thickness ranging from 8 to 10 millimeters. The surface treatment exhibited a smooth texture, occasionally displaying cordmarked patterns, or in some cases, a combination of smoothing over cordmarked surfaces. The presence of an interior-beveled lip can be regarded as a distinguishing characteristic of Howard Lake.

The primary location of decoration on vessels from Howard Lake is the exterior rim and shoulder. However, there are instances where decoration can also be found on the interior rim, lip, and even the mid-body area. The prevalent decorative modes encompass straight dentate stamps, ovoid stamps, trailed lines, and bosses that are impressed onto a surface that is smooth. The dentate stamps are commonly employed in a pattern of alternating oblique and horizontal bands on the rim, or in panels located on the lower rim or shoulder. Trailing lines are primarily employed to demarcate either horizontal or vertical zoning. The utilization of relatively sizable and unblemished surfaces on certain pottery fragments accentuates the concept of "panel-zoning." The utilization of external cordwrapped stick impressions is infrequent, and when it does occur, it typically manifests in a herringbone arrangement along the rim. The presence of a cordmarked surface as a form of decoration is infrequently observed. The application of lip and interior decoration is typically accomplished through the use of a dentate stamp or a stick wrapped with cord. Trailed lines are observed on the lip (Anfinson 1979:96; Arzigian 2008:40-41).

Sorg pottery is the characterized by being grit tempered, featuring a thickness ranging from 6 to 12 mm. Additionally, the pottery displayed a cordmarked body, with the rim being smoothed prior to the application of decorative elements. The vessels exhibited characteristics such as thick walls, wide mouths, flat lips, straight rims, slightly constricted necks, rounded shoulders, and conoidal bottoms. The manufacturing process was not known (Johnson 1959:24).

Anfinson (1979) proposed type known as Sorg Banded, which consists of two varieties: Sorg Banded Dentate and Sorg Banded Trailed. Additionally, he also introduced Sorg Zoned Dentate as another type.

The Sorg Banded Dentate variety exhibits a Banded type decoration that is primarily found on the rim, upper shoulder, and lip of the vessels. This decoration variety is characterized by alternating bands of dentate stamp impressions and punctates. The bands are demarcated by parallel lines. The reconstructed Sorg vessel, originating from the type site, exhibits a dentate band encircling the upper rim, adorned with a singular row of bosses. Punctates can exhibit either a square or round shape. Typically, the dentate stamp impressions exhibit a vertical or horizontal orientation.

In the Sorg Banded Trailed variety decorative elements are primarily concentrated on the rim region, typically featuring a pattern of alternating bands composed of cross-hatched trailed lines and unadorned bands. The bands within this particular category, such as Sorg Banded Dentate, are demarcated

by continuous lines, albeit in a singular form rather than a duplicated form. The second band below the lip is adorned with a series of square punctates or alternating square punctates with bosses. The lips of Banded Trailed do not exhibit any discernible embellishments.

The Sorg Zoned Dentate type is established by examining a single sherd. It encompasses both banding and zoned decoration. The sherd recovered from the Sorg Site exhibits a series of oblique dentate stamp impressions arranged in a singular row, positioned below the lip. This is then followed by another row consisting of alternating square bosses and punctates. The lower rim exhibits a pattern of alternating panels, characterized by smooth zones and oblique dentate stamp zones. The panels are additionally demarcated by trailed lines (Anfinson 1979:197-198).

Lake Benton Pottery

As stated in the introductory section of this thesis, the majority of sites in Minnesota exhibit a multicomponent nature. The Eleanor site, too, displays this characteristic, as an initial examination of ceramic styles can unveil various types of ceramics from different periods within the assemblage.

The Terminal Woodland period is identified by the presence of the Lake Benton phase in the Prairie Lake region (Gibbon 2012:147). The emergence of Lake Benton pottery can be attributed to the gradual evolution of styles and rapid advancements in manufacturing technology within the Fox Lake pottery

production. Distinguishing features between Fox Lake and Lake Benton include variations in the technology of ceramics and style. Lake Benton is mainly characterized by the prevalent utilization of exterior cordwrapped stick impressions, while trailed lines and bosses are notably absent. Anfinson described four types for the Lake Benton pottery (Anfinson 1997:76-80):

Lake Benton Cordwrapped Stick Impressed. The rims and upper shoulders of these vessels exhibit cordwrapped stick impressions arranged in bands that may be oblique, horizontal, and/or vertical. Occasionally, the lower rim displays distinct horizontal rows of punctates.

Lake Benton Vertical Cordmarked. This variety of ceramic is comparable to Fox Lake Vertical Cordmarked in appearance. The two types can be differentiated based on their respective characteristics pertaining to temper, thickness of walls, and form of vessels. Furthermore, the Lake Benton Vertical Cordmarked type lacks any form of exterior decoration.

Lake Benton Dentate. The characteristic that sets this particular type apart is the presence of dentate impressions with a fine-toothed structure, organized in patterns that are arranged in both horizontal and oblique bands.

Lake Benton Plain. This particular type is devoid of any form of decorative element. Fifty percent of the objects possess a smooth surface, while the remaining fifty percent exhibit a cordmarked-smoothed texture. The rims of this type exhibit a tendency towards being narrower and more linear compared to other varieties.

Nelson Phase Pottery

Cord impression, also known as single-twisted cord impressed, is a prevalent form of decoration commonly encountered in Woodland sites located in southern Minnesota. Scholars engage in discourse regarding this phenomenon and propose various taxonomic frameworks for cord impressed pottery (Anfinson 1997:79-80; Arzigian 2008:78; Holley 2023). In a recent publication, Holley (2023:12) proposed a new categorization of the cord impressed pottery for the region, drawing from an analysis of pottery collections found at the Nelson site. The Nelson site is located approximately 2 miles southwest of Mankato city, within one of the terraces along the Blue Earth River (Reichel 2015:36). The cord impressed pottery discovered at the Nelson site has been previously classified as either Madison Cord Impressed or Effigy Mound pottery, according to prior analyses. The latest archaeological investigations conducted by Ronald Schirmer have yielded additional evidence, leading to the identification of discrete components within cord impressed Nelson pottery, thereby establishing a new phase (Reichel 2015:8; Holley 2023:12).

Nelson phase dated 1050 to 900 BP (Holley 2023:38) and its pottery has been named the Loomis Ceramic Series after a former landowner of the site. Loomis ware exhibits a distinct composition characterized by a paste that possesses a dark or sandwich core, tempered with crushed grit containing iron pyrite. The surfaces of Loomis ware display a rough texture with incomplete smoothing, and the coloration ranges from yellow to gray. Holley proposed Cord

Impressed, Cordmarked, Smoothed Plain, and Incised types for the Loomis Ceramic Series (Holley 2023:13).

Loomis Cord Impressed. The cordmarked neck surface exhibits parallel and circumferential cord impressions. A series of punctuation marks and impressions are added at the bottom of the parallel cord lines that have been impressed. The vessels exhibit thin walls. Most of the rims are decorated with tool impressions (Holley 2023:14-16).

Loomis Cordmarked. The sole diagnostic characteristic for this particular type is the sporadic presence of rim notching, as evidenced by tool impressions, and the measurement of wall thickness. In general, Late Woodland cordmarked pottery exhibits a thinner wall compared to earlier variations. Specifically, Loomis Cordmarked pottery showcases an average wall thickness that measures less than 5 mm (Holley 2023:22-23).

Loomis Incised. This particular type of Loomis pottery lacks distinctive characteristics that would allow it to be easily distinguished from other types, with the exception of incised lines present on its exterior surface. Thin incised lines measuring 0.5 mm, medium-broad incised lines ranging from 0.9 to 2.7 mm, and broad incised lines measuring 3 to 3.9 mm were all recognized as distinct incised line varieties (Holley 2023:25-26).

Loomis Smoothed Plain. The general characteristics are the same as for other Loomis types, with a smooth surface on the rim and neck area and tool impressed rim decorations (Holley 2023:27-27).

CHAPTER 3: METHODS

Background Research

The preliminary investigation of the site involved a comprehensive examination of historical cartographic materials, encompassing topographic maps and aerial imagery. The maps were analyzed in order to determine whether any discernible features exist within the site area prior to excavation, as well as to identify any past disturbances in the area that might have had a detrimental effect on the integrity of cultural materials and features.

The investigation of the project area was carried out by conducting an archeological file review at the Archeology Laboratory of Minnesota State University Mankato. The objective of conducting this review was to ascertain whether there were any pre-existing records of archeological resources or prior surveys within the designated area and its vicinity.

Furthermore, the analysis and interpretation of data obtained from the Eleanor site archeological investigations were guided by a thorough review of various sources, including field notes, site forms, artifact catalogs, survey maps, and relevant publications.

Pottery Analysis

The Eleanor site was excavated over the course of three seasons (1976, 1977, 1978), and all of the artifacts recovered were subsequently deposited in the MNSU Archeology Laboratory. This thesis exclusively focuses on the re-

examination and re-cataloguing of the diagnostic pottery. The cataloging procedures employed adhered to the prescribed format designated in the catalog guide of the Minnesota Archaeology Integrated Database (MAID).

The primary focus of the analysis involved the examination of rim sherds, with particular attention given to attribute categories encompassing manufacturing techniques, morphological characteristics, and decorative features. Additionally, a selection of diagnostic body sherds garnished with decorative elements was included for the purpose of analysis.

The manufacturing attributes that were taken into consideration included the temper material, paste texture, exterior and interior surface treatment, and color. The study documented the alteration of the rim, its shape, orientation, and the morphology of the lip. The documentation encompassed various decorative techniques employed for the lip and rim, as well as the different types of body decoration. Furthermore, the research recorded metric data pertaining to the dimensions of decorative techniques, including length and width, as well as information regarding the frequency and types of decoration. The mass of the pottery was determined using an electronic balance, with measurements recorded to the nearest thousandth of a gram. The dimensions of pottery and its accompanying decorations were ascertained through precise measurements using calipers, with accuracy extended to the hundredth decimal place of a centimeter.

Additional types of metric data that are gathered include measurements such as rim and lip width, and wall thickness. Attributes that could not be

precisely determined as a result of the weathering process, exfoliation, or sherd fragmentation were documented as "indeterminate". The subsequent attribute explanations define the primary classifications relevant to this study in order to facilitate a comparative analysis using the MAID catalog guide:

Morphological elements refer to possible segments of a vessel, from which a sherd or fragment originated.

The *rim* refers to the region of a container that is situated directly above the neck, expanding up to the outer edge of the apical lip.

The *lip* refers to the uppermost section of the rim of a container.

The *shoulder* is the section of the body where a vessel exhibits its maximum width below the neck.

The *neck* is the section located immediately inferior to the rim and superior to the shoulder.

The term *body* refers to the lower portion of shouldered vessels, the area below the lip on unshouldered vessels, as well as fragments of pottery that do not possess discernible morphological features that would allow them to be attributed to a particular section of a vessel.

Temper. The term "temper" refers to the non-plastic cultural additions that are incorporated into clay by the potter prior to the formation of a vessel. The majority of clay types encountered in natural environments are not suitable for high-temperature firing. Due to its homogeneous composition, the clay is prone to fracturing or fragmentation when subjected to the processes of drying or

firing. Furthermore, the malleability of clays is hindered by its pronounced adhesive properties. The potter can enhance the workability of clay and minimize the occurrence of shrinkage and cracking in vessel walls by incorporating non-plastic inclusions into the clay mixture. This practice also facilitates the manual shaping process. The combination of temper and clay is commonly referred to as paste.

A wide range of materials can be incorporated into clay as a temper. Tempers can be broadly categorized into two main types: inorganic materials such as grit, grog, and sand, and organic materials such as ash, shell, and bone. In certain instances, a combination of both inorganic and organic tempering materials may also be observed.

Surface treatment. Surface treatments involve altering the original surface of a pottery wall, leading to the change in visual design and physical characteristics of the surface texture. Surface treatment can be documented in terms of its interior, exterior, and apical occurence.

Smoothing. Smooth surfaces on vessels can be achieved through intentional smoothing after the formation process or as a natural outcome of the manufacturing method, resulting in a smoothed appearance on the vessel's surface. In the North American context, the application of surface treatment is commonly anticipated due to the manufacturing techniques that necessitate the uniformization of surfaces prior to subsequent processes.

In the study area, the interior surfaces of the vessels exhibited a general trend of being smoothed. However, when identifying both interior and exterior

smoothing, it is crucial to ensure accuracy in the placement identification. Differentiating between the interior and exterior surfaces of split sherds that lack discernible morphological characteristics can pose a challenge. In these instances, the surface treatment is classified as "indeterminate".

Cordmarking. The surface treatment that exhibits a resemblance to continuous cordmarking or cord impressions is commonly referred to as "cordmarked". Separate cord impressions were examined as decoration type rather than surface treatment. When the vessel morphology and cordage direction are clearly identified, the directional characteristics, such as horizontal, vertical, oblique, or multidirectional, are recorded.

If it is feasible to obtain precise measurements, the diameter of the cord is documented. In addition, the twist type of the cordage is documented as s-twist, z-twist, or s-z-twist in cases of clear visibility.

Smoothed-over cordmarking. The physical and visual variations of smoothed-over cordmarking surfaces are influenced by the degree of smoothing and the characteristics of the cordmarking. The visibility and identification of surface treatment can be influenced by various factors, including the methods of surface application, use-wear, and post-depositional wear. To address these challenges, the utilization of comparative samples of smoothed-over cordmarked pottery would prove advantageous.

Smoothed over trailing. A method for treating the trailing surface of sherds, characterized by a smoothed-over appearance, has been observed. The presence of smoothed-over trailing surface treatment is recorded when the

properties of the cordage are not detected, but there are discernible vertical, horizontal, or oblique lines that can be seen beneath the smoothed surface.

Brushing. Identifying brushed surfaces can be challenging due to their resemblance to smoothed over cordmarked surfaces and naturally occurring erosion processes. A surface that has been brushed will display a greater degree of regular and distinct striations.

Burnishing. Burnished surface treatments can be distinguished from smooth surface treatments by the characteristic presence of a discernible sheen and a finely polished outer surface. The process of burnishing results in a surface that is smoother, denser, and exhibits a higher degree of regularity compared to the surface achieved through the process of smoothing.

Rim modifications. In the context of this study, the term "rim modifications" refers to alterations made to the rims of vessels. These alterations can include the addition of a clay matrix or the manipulation of the rim walls. These modifications are done in a way that changes the profile and overall appearance of the rim. Modified rims display a distinctive morphology characterized by the upward extension of the vessel's paste from the shoulder or neck to the lip, accompanied by the deliberate addition of excess material in a systematic manner.

Unmodified rims display a morphological characteristic in which the clay used to form a vessel is extended from the shoulder or neck region to the lip region without folding or intentionally adding material to increase thickness, reinforce, or modify the fundamental structure of the rim.

Thickened. The type of rim modification can manifest as either a gradual tapering or a distinct thickening of the vessel wall. The cross-sectional examination reveals the presence of thickening in either the interior, exterior, or both regions of the rim. Thickening is differentiated from other alterations by the absence of supplementary material and the thickening process being attributed to the compressive expansion of the paste, rather than folding it upon itself or incorporating a fillet.

Folded. The process of rim modification involves folding the upper edge of a vessel either outward or inward, and then shaping it so it aligns to the surface of the vessel. The result of this process is a rim that has twice the original thickness. This can be distinguished from rim modifications that simply increase the thickness, as it is characterized by a visible wrinkle in both the cross-section and along the lower edge of the folded region.

Rolled. The rim modification is distinguished by the rolling of the upper part of the rim, either on the inside or outside. In contrast to folded rims, rolled rims exhibit a distinct characteristic of not being paralell against the wall of the vessel, instead protruding outward. This phenomenon results in the formation of an enlarged projection of the lip, which displays a curved circular shape when viewed from the side.

Filleted. The process of filleting entails the systematic application of a cohesive strip of clay along the outer, inner, or apex areas of the rim. While the visibility of fillet boundaries may be diminished by subsequent smoothing, it is

typically possible to observe the lower and upper limits of fillets in cross-sectional inspection.

Lip forms. The term "lip form" pertains to the techniques used in shaping and the resulting stylistic and morphological characteristics of the uppermost part of the rim.

Flattened. Lip formations characterized by the flattening of the uppermost surface, resulting in a flat apical surface and a roughly perpendicular cross-section formed between the apical surface and the walls of the vessel. The flattening of the lip can occur simultaneously with the application of lip decorations, which may partially modify the visual aspect of the flattened lip subsequent to the initial modification.

Rounded. The term "rounded" is employed to describe a lip form characterized by the presence of a rounded or arc-shaped apical surface when observed in profile.

Thinned. Lip form characterized by a reduction in thickness of both the inner and outer surfaces of the upper edge, as observed when viewed in a perpendicular perspective. The observed lip morphology typically manifests as a gradual narrowing of the upper rim, leading to a peaked or pointed shape.

Thickened. Lip formations that display a thickening of either the interior, exterior, or both the interior and exterior portions of the upper rim, as observed when examining a cross-sectional view. The process of lip thickening can manifest as either a gradual tapering or a distinct thickening of the uppermost portion of the rim.

Beveled. Lip form that exhibit beveling on the interior, exterior, or both interior and exterior surfaces of a upper rim. The identification of beveling of the lip is based on the noticeable inclination of the apical surface of the lip compared to the wall of the vessel. The outcome of this process is the formation of sudden and narrow angles in the lip profile, in contrast to the right angles that are created when the lip is flattened.

Protruding. Lip pattern characterized by the presence of a horizontal protrusion either on the interior, exterior, or both interior and exterior aspects of the lip. The observed structure exhibits a notable characteristic when viewed in cross section, as it demonstrates an approximate 90-degree angle between the projecting lip and the wall of the vessel. The presence of protruding lips is characterized by a greater horizontal length compared to its vertical length, which distinguishes it from other other modifications.

Decoration. This study encompasses the categorization of various types of decorative elements under the umbrella of decoration classification. These elements are further classified based on encompassing thematic illustrations and are more precisely defined by specific attributes.

Cord impressed. The term "cord impression" refers to the utilization of a solitary band or zone of cordage in any given application. Within the broader classification, more precise designations such as single cord, knot, and loop can be employed. It is important to establish a clearer distinction between directional twists, specifically by employing the terms S-Twist and Z-Twist whenever feasible. The terminology "knot" and "loop" can be employed in

conjunction with the term "cord impressed" to denote the utilization of cordage that is either looped or knotted.

Cord-wrapped tool impressed. The creation of decoration by placing cordage-wrapped objects onto the wall of a vessel. The term "cord-wrapped tool" can be regarded as having the same meaning as the terms "cord-wrapped stick," "cord-wrapped paddle," "cord-wrapped rod," and "cord-wrapped object."

Tool impressed. Tool impressions are created by applying a plain tool in a downward and angled manner, into the surface of a vessel. Tool impressions are typically characterized by their longer and shallower nature compared to punctates.

Fiber impressed. The term "fiber impressed" is employed to categorize any decorative element that arises from the placement of plant fibers to the wall of a container. In general, fiber impressions tend to exhibit greater width and/or length dimensions compared to their depth. Fiber impressions can be distinguished from tool impressions based on the presence of single-directional grains or striations.

Finger impressed. Finger impressions typically manifest as circular in shape, with a shallow depth and a size ranging from small to medium.

Punctated. The creation of an ornamental feature by introducing an pointed object into the wall of a vessel at an approximate right angle, resulting in a hollow cavity on the vessel's surface.

Lunate. In the domain of punctate pottery ornaments, lunate punctates exhibit a linear internal structure. Lunate punctuates exhibit a configuration that bears resemblance to that of a half moon.

Dentate stamped. The term employed to designate an distinct pattern characterized by multiple rows of small, shallow, and closely positioned square or rectangular indentations. Dentate stamps are created by utilizing a comb-like or "toothed" tool to apply impressions onto the still wet or partially dried surface of a ceramic vessel.

Toothed. The term is used to describe a decorative element that appears in conjunction with a morphology that is distinguished by a protruding lip. Toothed lips are the result of a deliberate outward protrusion of the lip, followed by the application of vertical or oblique pressure on the external surface of the lips with a tool or pinching action.

Pyramidal toothed. The term is employed to categorize a design element that occurs when combined with a projecting ornamentation of the rim. The result of this process yields a discernible outwardly projecting band characterized by pointed structures resembling pyramids.

Trailed line. The term is employed to categorize a form of ornamentation created by the action of dragging a tool across the surface of a vessel wall that is wet and malleable. This process yields line patterns that are parallel-sided, plain, and either rectilinear or curvilinear in nature.

Incised line. Incised lines refer to decorative lines that are created by scribing either curvilinear or rectilinear patterns, typically characterized by a v-

shaped trench profile. The presence of incised lines on the surface of a vessel in a leather-hard state suggests a method of application that results in the removal of clay instead of its displacement.

Intaglio bossed. The term "intaglio bossed" refers to a accompanying design element that exists as a pointed-out or mirrored depiction of a decorative motif present on the opposite side of a vessel's wall.

Coded Catalog System

The present study utilizes preliminary analysis data obtained from a previously employed coded catalog system, which was once in use at the Mankato State University Museum of Anthropology. Nevertheless, the initial cataloging took place prior to the publication of standardized descriptions for Minnesota pottery types. As a result, there was a lack of consistent examination of attributes pertaining to production methods, materials, decorations, and types. Pottery samples for the study were collected through the coded catalog system's selection of rim sherds. Body sherds related to rim sherds were also included in the study collection in some cases. Selected diagnostic pottery for the thesis was re-cataloged because of alterations in format and the need for more comprehensive information.

This coded catalog system, although now considered obscure and obsolete, is employed in conjunction with original research for the purpose of conducting pottery analysis. The primary goal of using old catalog system in

this study is the provenience data associated with the artifacts that can be obtained only from this source.

GIS Analysis

Using GIS and remote sensing data, and topographical map of the excavation and settlement site constructed in order to better understand the context of the site. The implementation of a Geographical Information System (GIS) facilitated the digital mapping of each excavation block, enhancing visualization, documentation, and analysis capabilities.

Archival documents available in Archeology Laboratory at Minnesota State University, Mankato such as excavation level forms, field notes, and maps investigated in order to understand the architecture of the site and to create GIS models (Neubauer 2004). The collected data was systematically organized and entered into Microsoft Excel and, when appropriate, ArcGIS. This facilitated various statistical and spatial analyses of the site. In particular, an examination of the proportions of materials, varieties of pottery, and decorative elements present at the archeological site is justified. The purpose of GIS analysis was to collect initial data that could be used as a reference point for comparing and contextualizing the pottery styles.

CHAPTER 4: RESULTS

Historic Document Review

An examination of the 1855 United States Department of the Interior (DOI), Bureau of Land Management (BLM), General Land Office Records (GLO) plat for Township 110 North, Range 28 West, section 36 revealed that the Eleanor site area was situated on a 39.90 acre land plot on a peninsula to the southwest of Swan Lake during the mid-19th century (Map 4). The map in the vicinity of the project area, as well as the surrounding areas, did not provide any evidence of historic occupation or alteration of the landscape.

According to the Nicollet County Townships map by Haynes & Woodard (1885), the plot was divided between six separate land parcels (Map 5). These parcels were identified as follows: P. Pehling with an area of 22.20 acres, F. Bruns with an area of 11.39 acres, W. Brands 9.91 acres, C. G. with an area of 4.14 acres, P. G. P. with an area of 9.75 acres, and A. G. with no specified acreage. Nevertheless, there was a lack of observable evidence indicating any historical occupation or alteration of the landscape in the designated area.

The information presented in the 1899 plat book of Nicollet County, published by the North West Publishing Co., was obtained from county records and careful surveys (Map 6). When compared to the township map of 1885, the plots depicted therein have remained unaltered, with the exception of the ownership transfer of the plat measuring 4.14 acres from C. G. to L. F. Furthermore, it can be inferred from the plat book of 1899 that the individual who possessed the 9.75-acre plot is identified by the surname Peterson. The

1899 plat book of Nicollet County does not contain any information pertaining to occupations or other activities in the area.

Following the Atlas and Farm Directory of Nicollet County published in 1913 by Webb Publishing Company, there was only one instance of ownership transfer in the area, and no other significant changes were observed in the plots (Map 7).

The 1927 edition of the Atlas of Nicollet County, published by Anderson Publishing Company, exhibits minor insignificant alterations when compared to the preceding publication of the Atlas and Farm Directory (Map 8).

An analysis of aerial photographs obtained from the Minnesota Historical Aerial Photographs Online (MHAPO 2023) website, specifically from the years 1938, 1950, and 1968, indicated a transformation in the project area's landscape (Maps 9, 10, 11). The findings revealed a gradual conversion of naturally occurring wooded areas into agricultural fields through the process of tree clearance. Although the Eleanor site excavation area was covered by naturally grown woods until 1950, agricultural plots gradually expanded in the surrounding area. Based on the field notes of the crew, it is apparent that excavation commenced in the plow zone in 1976. It is evident that during the period spanning from 1950 to 1976, the site location underwent a transformation into an agricultural field. Although the georeferencing of the datum and location of the excavation units could not be established with certainty, the available evidence suggests that agricultural activity had a substantial impact on the archaeological deposit during the specified period.

Archaeological Excavations at Eleanor Site

The Eleanor site was initially identified by Richard Strachan, a faculty member at Mankato State University, which is now known as Minnesota State University, Mankato. From 1976 to 1978, Strachan directed three summer field schools at the site. These field schools encompassed surface surveys and the excavation of several units. The field schools constituted a component of a survey conducted by Strachan in the mid-1970s to mid-1980s, encompassing the Swan Lake and Middle Lake region (Anderson 2018:30).

The collection of artifacts obtained from Strachan's excavation at 21NL30 is substantial and remains to be thoroughly examined. Moreover, Strachan did not generate a comprehensive report documenting his activities at the site.

The primary source materials, such as field notes and forms, are stored at Minnesota State University, Mankato. The site is characterized by the presence of various artifacts, such as lithic debitage, scrapers, projectile points, celts, hoes, hammerstones, and mammal bones (Anderson 2018:30). Based on the field notes provided by the crew members, the pottery retrieved from the archaeological site comprises a mixture of fragments exhibiting both smooth and cord-marked surfaces. A number of these fragments exhibit ornamentation in the form of dentate or punctate patterns, while the predominant composition of the pottery consists mainly of grit as a temper. According to Anderson (2018:30), the assemblage of artifacts associated with site 21NL30 displays features that suggest the possibility of a Woodland occupation. Several additional artifact scatters associated with the Woodland tradition can be found

on the same peninsula as 21NL30. These include sites such as 21NL25, 21NL26, 21NL27, 21NL29, 21NL32, and 21NL34.

The information regarding the Eleanor excavations was derived from the field notes of crew members, primarily consisting of students from Mankato State University and Hamline University. Additional and extensive information was derived from the field notes of Kathy Roetzel, the assistant of Richard Strachan.

1976 Archaeological Excavation

The first year of fieldwork at the Eleanor Site took place in June 1976, under the supervision of Richard Strachan, who was a professor at Mankato State University at that time. The initial steps for fieldwork encompassed the identification of the designated excavation site, the establishment of a datum point, and the implementation of a 10x10 meter grid layout across the excavation area. A grid for excavation was laid out by extending 10 meters to the west and 10 meters to the north from the datum point. Prior to the beginning of the excavation, soil probe samples were collected from each unit within the excavation grid.

The excavations were conducted in 10 cm levels, with each pair of consecutive levels being categorized as a distinct "phase." However, the term "phase" is never used in archeology in this context. These phases were

designated as follows: phase I (0-20 cm), phase II (20-40 cm), phase III (40-60 cm), and phase IV (60-80 cm).

Within the 3N9W unit, large fire-cracked rocks, pottery fragments, and clay lenses containing traces of charcoal and remnants of seeds were found. A potential fire hearth or storage pit was therefore identified.

The archaeological excavation at the 1N10W unit yielded shell and seed remains at the "phase II" level. Furthermore, despite the fact that the size is too large for post molds, field notes indicate that three potential post molds measuring 56 cm were observed within the 3N10W unit. This unit yielded pottery fragments, bone remains, lithic artifacts, and fire-cracked rocks. The presence of post molds suggested the potential existence of a structural wall for the hypothetical house, while the interior of the house exhibited a higher degree of compactness compared to the exterior. Additionally, the floor was observed to be sporadically covered with clay debris.

In the 4N7W and 4N8W units, a concentration of charcoal was determined. A significant quantity of artifacts was discovered in the fire hearth, which extended from the northwestern corner of the 4N7W location to 4N8W. Furthermore, it was observed that there is a concentration of clay along the southern border of the units. A total of 31 artifacts were discovered within the 4N7W unit, consisting of bone fragments, specifically the jaw of an animal, red ochre, pottery sherds, and charred nut shells.

The identification of various house bases was facilitated through the analysis of clay deposits in the excavated units, which were examined based on their texture and color. Furthermore, the degree of soil compaction was determined by highly speculative technique, as tapping the surface of the ground and assessing the resulting sound using a stethoscope.

Using this approach, the floors of houses and the pathways that connect them were identified at a level of 60 centimeters. In addition to the observed discoloration and alteration in texture of the clay, the presence of possible post molds overlapping these structures has been identified. In the lowermost level, referred to as "phase IV," at unit 1N10W, no artifacts were discovered. However, alterations in soil color and texture were observed, and a correlation between the location of the structures and the presence of wood evidence appeared to provide support for the existence of houses.

In the 4N8W, 4N9W, and 4N10W units, below the depth of 55-60 cm, there existed sand of a light color that appeared to be clean. As indicated in Kathy Roetzel’s field notes, it was determined that the house floors were initially covered with sand prior to occupation. The sand lens reaches a depth of 74-76 cm.

Within the 4N6W unit, it was observed that at the uppermost level of 60-70 cm, there existed a layer of soft humus. However, at a depth of 63-64 cm, this layer transitioned into a compacted yellow light colored clay. The layer under investigation exhibited a substantial quantity of artifacts, while the excavation process reached a sterile zone at a depth of 70 cm.

The excavation units were covered with newspaper and subsequently backfilled at the conclusion of the season. Furthermore, a comprehensive surface survey was carried out along the 5N and 9N line, during which artifacts were systematically documented and stored in bags.

1977 Archaeological Excavation

The field season started with the relocation of the datum point from the previous year. A 1x1 meter test unit was excavated in a location identified as a potential waste area within the site. The test pit yielded lithics, pottery sherds, and bones.

A total of 21 new units were established by implementing a grid system to the east of the southern half of the excavation block from the previous year. Additionally, two lines of units were added in a southeast direction from the datum point. The objective of the field season was to successfully complete the excavation of the southern portion of the house that was discovered in the previous year. Prior to beginning the excavation, an intensive surface survey was conducted, which involved the thorough examination of the site's surface. Additionally, soil probes were taken from the recently established units.

The soil screening method proposed entailed the implementation of a 1/8 inch mesh, in conjunction with the process of water screening. Additionally, the decision was made to implement 5 cm leveling intervals instead of the 10 cm

intervals used in the previous year, with the aim of enhancing the analytical significance of the data.

The rim sherds recovered from unit 3N3E exhibit predominantly flat or rounded rims, in contrast to the pinched rims that were more prevalent in the previous year. Within the 4N3E unit, a deer tooth and another sizable bone were discovered. In the 2N2E unit, pottery sherds with cord-wrapped tool impressions were found. Additionally, the 2N3E unit yielded burned bone, while the 3N2E unit contained large-sized charcoals.

A set of post molds was discovered in units 4N1E, 4N2E, and 5N3E, which are believed to represent the remains of a southeastern wall from one of the houses that were excavated in the previous year. The subsequent segment of the wall, located in the southern portion of the block, is projected to extend up to the unit 3N1E. In addition, incorporation of a walkway and the potential door place were identified in this unit. The floor of the house in the 1N3E unit was discovered at a depth of 62-63 centimeters. At the 60-65 cm elevation, the floor of all housing units became exposed.

A collection of six excavation units, arranged in a new excavation block within the units of 12N10W-13N12W. In the southwestern corner of this block, an additional potential wall and post mold were identified. The excavation block also showed increased levels of disturbance due to agricultural activity.

1978 Archaeological Excavation

The field season resumed with the relocation of the datum point and the collection of soil probes. During the initial month of the season, the field crew primarily focused on conducting an intensive field survey on the plow zone adjacent to the Eleanor site, as excavation activities were hindered by the persistent heavy rainfall. While rain may pose challenges to excavation, it can also have positive effects on field surveys by enhancing artifact visibility and facilitating the washing of plowed soil. Furthermore, as the crew members, who were students, acquired more experience in conducting surveys, there was a gradual increase in the number of artifacts that were uncovered during the survey. For instance, the field survey yielded a total of 163 artifacts on June 15, 138 artifacts on June 16, 466 artifacts on June 19, 729 artifacts on June 21, and 850 artifacts on June 22.

During the survey, the discovered artifacts were carefully wrapped in foil. The locational details and field numbers were recorded on a piece of paper, and the artifacts were then placed in bags for subsequent cataloging in the laboratory. The survey material's location was recorded in terms of angle and distance from the datum point (Map 12).

The excavation grid was established in the previous year's 21 units to continue excavation in these pits. The dirt was removed from the units that were backfilled at the end of the season last year. In order to reach the previous year's depth, the crew must locate the newspaper layer that covered the units.

The absence of a newspaper layer in certain excavation areas resulted in initial confusion during the early stages of the excavation process.

All units were leveled to a depth ranging from 80 to 85 centimeters, with some units reaching a depth of 95 centimeters. The number of artifacts and features observed in the 1978 year was lower compared to previous years. Following the excavation process, once the sterile layers were reached in all areas, the units were subsequently backfilled with a combination of soil and organic matter. This backfilling procedure was carried out with the intention of rendering the excavated areas suitable for agricultural activities.

Pottery Analysis Results

A grand total of 124 fragments of pottery were re-cataloged. All of the sherds were tempered with grit. The pottery sherds exhibit surface treatments characterized by the presence of smoothed over vertical cordmarking, accounting for 31.45% of the observed samples, and smoothed over cordmarking, which represents 29.03% of the total, smooth (24.19%), smoothed over multidirectional cordmarking (3.23%), smoothed over horizontal cordmarking (1.61%), smoothed over vertical trailing (1.61%), brushed (1.61%), brushed over cordmarking (1.61%), smoothed over cord wrapped tool impression (0.81%), paddling/burnishing over horizontal cordmarking (0.81%), brushed over multidirectional cordmarking (0,81%), exfoliated (1.61%), and indeterminate (1.61%) (Table 1). The sherd morphology counts comprise a total

of 48 body sherds and 76 rim sherds. Twist direction of cordmarked pottery sherds are s-twist (18.39%), z-twist (4.60%), and indeterminant (77.01%) (Table 3).

Decorations identified on all analyzed sherds include comb stamped (0.82 %), cord impressed (23.77 %), cord-wrapped tool impressed (9.02 %), dentate stamped (4.92 %), fiber impressed (0.82 %), finger impressed (4.1 %), incised line (8.2 %), intaglio bossed (3.28 %), punctated (13.11 %), tool impressed (17.21 %), toothed (2.46 %), and trailed line (12.3 %) (Table 8).

The cultural components of Middle Woodland, Initial Woodland, and Terminal Woodland periods have been identified by the pottery analysis. The coexistence of these various cultural elements implies a significant duration of human habitation at the Eleanor site.

Middle Woodland Pottery Types – Havanoid Pottery

A group of twenty-five fragments have been classified as Havanoid pottery. The percentage of Havanoid pottery fragments that were examined for the project constitutes 20.16% of the total number of specimens examined. Among the entirety of Havanoid sherds analyzed it was determined that four of them belonged to the Howard Lake phase pottery, two sherds were identified as the Naples Stamped variety, one sherd was classified as Naples Dentate Stamped, and one sherd belonged to the Banded Dentate variety of Sorg phase pottery. Nonetheless, a total of seventeen fragments were classified solely as

Havanoid, lacking any specific categorization within this variety. A total of twelve fragments from the Havanoid collection were unearthed at level 1 (0-20 cm), and an additional nine fragments were acquired from the surface collection. Three pottery fragments originating from the Havanoid pottery wwere retrieved from archaeological strata identified as level 3 and subsequent layers, denoting a vertical range of excavation measuring 50-60 cm and beyond (Table 5).

Fifteen Havanoid sherds exhibit the presence of decorative elements. The examination of the Havanoid pottery fragments unveiled the existence of two cord impressions, nine punctate impressions, seven trailed lines, four dentate stamps, three incised lines, and one example of each cord impression, cord-wrapped tool impression, tool impression and comb stamped decoration types.

Thirteen fragments of one vessel's body and one fragment of its rim have been identified and assigned catalog numbers 1 through 14, indicating that they belong to the same vessel (Figure 1). The observed wall thickness of the sherds exhibits a range spanning from 3 to 9 mm, with an average value of 6.2 mm. The provenance of the pottery fragments originates from various excavation units and depths. The fragments exhibit a light grey hue on their outer surface. The interiors exhibit an inconsistent color scheme, often featuring darker tones that range from light brown to dark grey. The paste in the profile exhibits a coarse texture, characterized by a light color and an average-sized grit temper. The fragments exhibit a surface that contains reflective particles of mica.

The sole fragment of the vessel's rim possess no modifications, displaying a curved shape and an everted orientation (Figure 2). The slightly exterior beveled lip flattened, with rounded corners. The apical lip exhibits tool impressions that are rectangular in shape. The depressions resulting from tool impressions can be observed on the outer edge of the lip. The exterior surface of the rim has smoothed over 3.5 mm wide cordmarking.

The body sherds also display a surface treatment characterized by smoothed over cordmarking on the exterior and a smooth surface on the interior. The cordmarking's smoothness and visibility vary across the surface, influenced by the placement and design of the decoration. In certain areas, cordmarking is observed primarily for decorative purposes, whereas regions exhibiting punctate patterns appear to have undergone smoothing. Rectangular-shaped punctates are positioned amidst parallel lines that exhibit a slight curvature and intersect at some point on the surface, with a width ranging from 2.6 to 3 mm. The identification of the vessel as the Havana Zoned variety of Havanoid Ware is based on an analysis of the lip form, wall thickness, and decoration of the sherds.

The Middle Woodland ceramic fragment, registered with catalog number 29, has an unmodified, curved, vertical rim (Figure 3). The upper portion of the rim exhibits a slight eversion in the lip region. A portion of the rim exhibits a flattened shape with rounded corners, while another portion features an interior bevel and a rounded apical lip. Apical lip of the rim decorated with oblique cord-wrapped tool impressions. The rim sherd exhibits a smooth surface treatment

on both its exterior and interior. The rim displays a relatively substantial thickness, with an average measurement of 8.87 mm and a maximum thickness of 10.31 mm. Surface of the rim decorated with two vertical rows of horizontal cord-wrapped tool impressions, and another row of oblique (or criss-cross) cord-wrapped tool impressions. Based on its decorative attributes, lip morphology, and thickness of the sherd, the ceramic fragment has been classified as a variety of the Naples Stamped (cord-wrapped tool) series type within the Havana Ware.

The following sherd, cataloged with catalog number 53, represents a fragment of a vessel's neck from the Middle Woodland period (Figure 4). The fragment possesses a considerable thickness of 7.22 mm and displays interesting characteristics. The outer surface of the object exhibits a vertical cordmarked pattern, characterized by s-twist. Above the neck region, the surface is notably smoothed and features a series of parallel horizontal dentate stampings, reminiscent of comb-like stamping. Below the neckline, there are cord markings with an average diameter of 1.94 mm that lack smoothness. The interior exhibits signs of surface teatment, where cordmarking has been heavily smoothed out, making it difficult to determine the exact nature of the twist and diameter of the cord. The ceramic fragment exhibits contrasting hues on its inner and outer surfaces. The outer surface of the sherd displays a range of color from golden buff to light grey, whereas the inner surface showcases a darker color palette ranging from dark brown to black. The identification of the sherd as a variety of Naples Stamped type of Havana Ware is based on the

observed differences in interior and exterior color, decoration type, and thickness.

Catalog number 71 represents another rim sherd from the Middle Woodland period, featuring exterior decoration consisting of parallel oblique rows of rectangular-shaped dentate stamping that extend up to the lip (Figure 5). The rim exhibits a straight shape and a vertical orientation, accompanied by subtle beveling along the inner edge. The interior lip region has been enhanced with the application of clay fillets. Both the interior and exterior surfaces indicate a smooth surface treatment. The lip exhibits a flattened shape, with an additional oblique flat strip present at the outer corner due to the process of smoothing the corner. The rim fragment demonstrates a measured thickness of 7.98 mm, while its maximum thickness is recorded as 8.44 mm. The rim sherd has been identified as a variety of Naples Stamped type of Havana Ware, based on its decorative features and thickness.

The next Middle Woodland rim sherd with a catalog number 26 is from a surface collection of the Eleanor (Figure 6). The rim displays an unaltered form, characterized by its curved shape and outward orientation, along with the presence of beveling on the outer edge of the lip. The average thickness of the piece of property under consideration is determined to be 8.23 mm, with a maximum recorded measurement of 9 mm. Both the interior and exterior surfaces were smoothed. There is a fiber impression trace (possibly accidental) on the interior surface. The outer surface has been decorated with oblique dentate stampings extending to the lip. Beneath this decoration, there are two

indistinctly shaped punctuations with angular positioning, accompanied by another line of dentate stamping situated below the punctuations but with a horizontal orientation. The identified sherd, characterized by its decoration and beveled lip form, is related to the Banded dentate type of Sorg pottery within the Havanoid Ware category.

The body sherd, assigned the catalog number 24, has been identified as Howard Lake phase pottery of Havanoid Ware (Figure 7). This determination is based on the presence of oblique and horizontal rectangular shaped dentate stamped decoration, as well as an average wall thickness of 8 mm.

Another rim segment from Howard Lake, registered as catalog number 95, comprises two adjacent pieces (Figure 8). A fragment of a rim pottery vessel was discovered in unit 1N,2E, at a depth of approximately 75-80 cm. The rim exhibits pronounced smoothing on both its exterior and interior surfaces, resulting in a reduction of cordmarking. The indeterminacy of twist type and cord diameter persists due to the application of excessive smoothing. The rim form remains unmodified, the shape is curved, and the orientation is vertical. The average thickness of the pottery sherd is 9.4 mm, with a maximum measured thickness of 9.6 mm. The upper interior portion of the rim exhibits a beveled structure, while the apical lip displays a rounded contour. The pottery sherd has been identified as belonging to the Howard Lake phase of Havanoid Ware, based on its lip form and thickness of the wall.

The rim sherds, which have been assigned the catalog numbers 36 (Figure 9) and 87, were discovered in separate excavation units. These sherds

exhibit characteristics that suggest they belong to the same vessel. The rim sherds exhibit a surface treatment characterized by smoothed over cordmarking on both the exterior and interior surfaces. The pottery fragments display an average wall thickness of 5.52 mm, while the lip region displays a maximum thickness of 8.68 mm. The rim is straight and slightly turned outward. In the lip region, the wall of the vessel folded inward. Folding action produced a thicker lip and a flattened shape. The apical lip exhibits a slight beveling outward. The rim sherds have been classified as Howard Lake phase pottery based on their thickness and lip form.

Two other rim sherds from one vessel, catalog numbers 32 and 33 (Figure 10), have been separately cataloged. These sherds originate from the same excavation unit (5N,1E). Both the interior and exterior surfaces exhibit a smooth surface treatment. The rim sherds display an average wall thickness of 9.35 mm, with a maximum thickness of 9.6 mm. The unmodified rims are characterized by a straight shape, oriented vertically, and possess a slightly rounded apical lip. The outer edge of the lip is more sharply defined compared to the inner edge. The outer surface exhibits three punctate formations that are shaped like lunate. The rim sherds have been classified as Havanoid due to their wall thickness and the presence of lunate-shaped punctates.

Initial Woodland Pottery Types – Fox Lake Pottery

As discussed in the background chapter of this thesis, the Prairie Lake Archeological Region during the Initial Woodland period is characterized by the presence of the Fox Lake phase and its associated pottery. In total, eight pottery fragments have been identified as variations of Fox Lake pottery. A total of five rim sherds were classified as belonging to the Fox Lake Vertical Cordmarked type. However, the specific subtype of three body sherds with general Fox Lake characteristics could not be determined.

The proportion of Fox Lake pottery sherds that were analyzed for the research project accounts for 6.45% of the total sample. All of the sherds from Fox Lake that were examined displayed a surface characterized by cordmarking. Four of the pottery fragments were successfully identified as s-twist cordage, whereas the specific twist type of the remaining four fragments could not be determined. Two fragments of pottery from the Fox Lake collection were excavated at a depth of 50-60 cm (level 3), while one fragment was discovered at a depth of 0-20 cm (level 1) and another at a depth of 60-70 cm (level 4). An additional four ceramic fragments were acquired through the process of surface collection (Table 5).

Decorative elements are observed in five of the Fox Lake sherds. The analysis of the Fox Lake pottery sherds revealed the presence of two cord impressions, three punctate impressions, one trailed line, and two intaglio bossed decoration types (Table 8).

One of the rim fragments identified as Fox Lake Vertical Cordmarked, bears the catalog number 28 (Figure 11). It was recovered from excavation unit 13N,12W at a depth ranging from 50 to 55 cm. The average wall thickness has been determined to be 7.41 mm, while the maximum thickness in the lip region has been measured at 12 mm. The outer surface of the rim exhibits a smoothed over cordmarked texture with an s-twist pattern. It features a cordmarking that is 2.66 mm in width. Additionally, there is a horizontal line of ovate punctates located 1.5 cm below the lip. The interior surface exhibits a roughly smoothed texture, with distinct intaglio bosses that prominently display punctate patterns. The rim exhibits a curved shape and a slight eversion, with increased thickness in both the exterior and interior portions resulting from a partial folding and flaring of the lip region. The apical lip exhibits a rounded shape, while the width of the lip displays inconsistency. The identification of the artifact as the Fox Lake Vertical Cordmarked type is based on an analysis of its surface treatment, decoration, and wall thickness.

A rim sherd that has catalog number 27 exhibits a surface treatment characterized by a smoothed-over cordmarked texture, similar to the previously analysed rim (Figure 12). The exterior surface of the rim sherd exhibits two ovate punctates, while the interior surface smoothed and features corresponding intaglio bosses. The unmodified, curved, and everted rim exhibits a wall thickness of 6.58 mm, while its maximum measured thickness is 8.41 mm. The rim exhibits a rounded shape and displays a distinct cord impression on its apical lip reion. Additionally, the upper portion of the rim appears slightly thinner. The identification of the rim sherd as belonging to the

Vertical Cordmarked type of pottery from the Fox Lake phase is based on an analysis of its surface treatment, decoration, and wall thickness.

The rim sherd registered with catalog number 51 displays the same exterior and interior surface treatment, respectively smoothed over cordmarking and smooth (Figure 13). Twist type of the cordmarking is s-twist and diameter of the cord measured 1.75 mm wide. The unmodified, straight, vertical rim has no decoration either exterior, nor interior. While the apical lip region is decorated with a cord impression. In the lip region, the rim is thinned and the apical surface of the lip is flattened. This rim sherd demonstrates average wall thickness of 7.02 mm with 8.41 mm maximum thickness. By the surface treatment and thickness of the wall, the rim sherd can be identified as Vertical Cordmarked type of the Fox Lake pottery.

The other fragment of a rim registered by catalog number 58, exhibits a cordmarked exterior surface that has been brushed over, while the interior surface appears smooth (Figure 14). There are two amorphous-shaped punctate decorations located 1 cm below the lip, as well as a cord impression on the apical lip. The ceramic fragment exhibits an unmodified, curved shape, featuring a rim that is slightly turned outward. The fragment possesses a wall thickness of 7 centimeters, with a maximum measured thickness of 7.51 centimeters. The apical lip region exhibits a flattened morphology, characterized by an inner edge that is more rounded compared to its outer edge. The identification of the rim sherd as Fox Lake Vertical Cordmarked type is based on the analysis of its decoration, wall thickness, and surface treatment.

The sherd from the Initial Woodland period, listed as catalog number 25, exhibits a smoothed exterior with cordmarked patterns and a similarly smoothed interior surface, consistent with the majority of preceding specimens (Figure 15). The wall thickness was determined to be 8.57 mm, with a maximum thickness of 9 mm. The rim fragmrnt remains unmodified and exhibits a straight shape, with a vertical orientation. It possesses a rounded lip that features a subtle exterior bevel. The rim sherd has been identified as belonging to the Fox Lake Vertical Cordmarked type based on its surface treatment and wall thickness.

The body sherd registered with catalog number 56 demonstrates a smoothed over cordmarked or cord-wrapped tool impression surface treatment on the exterior surface (Figure 16). The interior surface exhibits a smooth texture and is adorned with punctate marks in an oval shape, while the exterior surface features a decorative design element characterized as intaglio bossed. The average wall thickness of the sherd has been measured to be 7.93 mm. The body sherd has been identified as a variety of Fox Lake pottery based on its decoration, wall thickness, and surface treatment.

The body sherd assigned the catalog number 73, exhibits a surface treatment characterized by the smoothing of cordmarking on its exterior surface, as well as a smoothed over trailing on its interior surface (Figure 17). The cord type is classified as an S-twist with a diameter of 1.41 mm. The sherd exhibits trailed line decoration on its exterior surface. The average measurement of wall thickness has been estimated to be 7.31 mm. The

identification of the body sherd as a variety of Fox Lake pottery is based on the analysis of surface treatment and wall thickness.

A further fragment of a body vessel exhibiting a cordmarked exterior surface treatment, which had been smoothed over, has been assigned the catalog number 67 (Figure 18). The interior surface of the sherd exhibits a smooth texture. Cord markings exhibit clear and readily recognizable characteristics, particularly in the context of s-twist cord type and a diameter measuring 1.7 mm. The average thickness of the sherd's wall measures 8.23 mm. The sherd has been classified as a variant of Fox Lake pottery, based on its surface treatment and wall thickness.

Terminal Woodland Pottery Types

Lake Benton Pottery

Lake Benton pottery is included in the collection, comprising a total of twenty-three pieces. The proportion of Lake Benton pottery sherds that were analyzed for the project amounted to 18.55% of the entire sample. The Lake Benton collection includes eighteen pottery rim sherds, which constituted approximately 23.68 percent of the total rim sherds that were examined. Out of the total of twenty-three Lake Benton sherds that were analyzed, it was observed that merely one sherd exhibited a smooth surface, whereas the remaining twenty-two sherds displayed a cordmarked surface. A total of nine fragments of pottery were determined to exhibit s-twist cordage, whereas no

instances of z-twist cordage were detected on the Lake Benton pottery. However, the specific twist type of the remaining ten sherds has yet to be determined. A total of seven pottery fragments from the Lake Benton collection were recovered at level 1, spanning a depth of 0-20 cm. Additionally, two sherds were found at level 3, which corresponds to a depth range of 50-60 cm. Lastly, one sherd was unearthed at level 4, situated at a depth of 60-70 cm. Furthermore, a total of thirteen pottery fragments were gathered from the surface (Table 5).

Out of the twenty-three Lake Benton sherds, a total of eighteen exhibit decorative elements. The Lake Benton pottery fragments have been identified to exhibit various decorative types, including eleven cord impressions, three tool impressions, two incised lines, one cord-wrapped tool impression, and one dentate stamped impression. The following paragraphs provide several instances of Lake Benton pottery (Table 8).

The first three fragments, assigned the catalog numbers 21, 70, and 37 exhibit vertical cordmarking on their outer surfaces, while their inner surfaces display a smoothed texture (Figure 19). The average diameter of S-twist cordage measures 1.62 mm. The average wall thickness of three rim sherds is 4.96 mm, with a maximum measured thickness of 5.81 mm. The sherds exhibit a homogeneous appearance in terms of their paste in profile, characterized by the presence of grit particles of medium size. Both surfaces exhibit a high degree of smoothness, with no visible protrusions or grit embedded within the vessel's surface.

The vertical rims of the vessel exhibit a curved shape and have been enhanced by the application of an additional layer of clay measuring 1 cm in width to the upper portion of the exterior surface. It appears that the upper rim region underwent compression and flattening upon the application of clay. Despite the clear visibility of the excess clay border, there are no significant variations in wall thickness between this particular region and below the thickened line. Following the application of clay, the lip of the vessel had been cut by a sharp tool. The process of cutting resulted in creating a flat apical lip with sharp edges, as well as slight protrusions on the sides occurred. Furthermore, the apical lip is adorned with a cord impression. The process of apical cord decoration involves the folding and imprinting of surface cordage onto the apical lip region, rather than creating a separate impression of the cord to the lip. The sherds have been identified as fragments of the Lake Benton Vertical Cordmarked vessel, based on their surface treatment method and wall thickness.

Three another rim sherds that are part of the same vessel have been cataloged with the assigned numbers 59, 103, and 107 (Figure 20). These sherds exhibit vertical cordmarking on their exterior surface, while the interior surface appears to be smoothed. The average wall thickness of the sherds is 4.65 mm, with a maximum measured thickness of 6.31 mm. The indeterminacy of cord twist type arises from the presence of smoothing over cordmarking. However, the average cord diameter was measured to be 3.21 mm. The paste of the sherds exhibits an extensive amount of tempering with medium-sized grit,

resulting in the presence of grit particles that extend into both the interior and exterior surfaces of the sherds.

The unmodified rims exhibit a predominantly straight shape with slight curvature observed in certain regions and a minimal degree of inward inclination in the lip area. The lip of the vessel had been cut by a sharp implement and subsequently rendered flat. Due to external pressure exerted on the apical lip, the interior and exterior lip region expanded by approximately 3-4 mm below the lip line. Consequently, a horizontal depression formed beneath this expanded strip. Following the smoothing of the lip corners, the edges have been rendered more even. However, certain regions, particularly towards the interior of the vessel, exhibit minor protrusions. The apical lip of the vessel is decorated with folding and impressing of the cordage, which has been wrapped around its surface to make cordmarked surface treatment. The identification of the sherds as the Vertical Cordmarked variety of Lake Benton pottery was determined based on the surface treatment method and wall thickness.

Two rim fragments, bearing the catalog numbers 109 and 118, were discovered in separate units within the excavation site at a depth ranging from 0 to 20 centimeters. The outer surface of the pottery fragments exhibits evidence of vertical cordmarking that has been smoothed over. Additionally, due to erosion or use over time, the exterior surface of the vessel has acquired a rough appearance. With regard to this limitation, the determination of the cord's twist type or diameter was not feasible. The average wall thickness of

the sherds is 5.57 mm, with a measured maximum thickness of 6.36 mm. Unmodified rims possess a straight configuration and are oriented vertically. The upper portion of the rim, specifically the region in close proximity to the lip, exhibited thinning. The apical lip is adorned with a cord impression. The sherds have been classified as belonging to the Vertical Cordmarked type of the Benton Lake pottery, based on their wall thickness and surface treatment method.

The rim fragment, assigned with catalog number 57, exhibits vertical cordmarking on its outer surface, while the inner surface displays a smoothed texture (Figure 21). The average wall thickness of the pottery fragment is 6.12 mm, while the highest recorded thickness measures 7.45 mm. The cord type is categorized as an S-twist with a diameter measuring 3.08 mm. The rim sherd displays a straight shape, characterized by a vertically oriented. The upper exterior portion of the rim is enhanced by the addition of extra amounts of clay, resulting in a filleted appearance. The delineation of the fillet's boundary is readily apparent. The lip of the ceramic fragment had been cut by a sharp implement and subsequently flattened. The corners were smoothed, and any surplus clay resulting from the cutting of the lip was once again folded towards the outer edge of the lip. The cord impression adorns the apical lip region of the rim. The identification of the Vertical Cordmarked variety of Lake Benton pottery was achieved through the application of the surface treatment method and analysis of the wall thickness of the rim sherd.

The subsequent rim fragment of a pottery vessel, assigned by its catalog number 17, exhibits a surface treatment characterized by the presence of smoothed vertical cordmarking. The observed orientation of cord markings exhibits a slight diagonal inclination rather than a strictly vertical alignment. The indeterminacy of the cordage twist type is attributed to the smoothing process. However, the average diameter of the cord was measured to be 1.88 mm. The average wall thickness of the rim sherd was measured to be 6.42 mm, while the maximum thickness recorded was 6.74 mm. The interior surface of the rim fragment has been subjected to a process that resulted in its smooth texture. The interior surface of the sherd exhibits a pattern of criss-cross oriented cordmarking, spanning a 2 cm wide strip located below the lip line. Following a 1 cm interval, there are additional cord impressions arranged in a diagonal orientation. The upper portion of the rim exhibits a curved shape with an outwardly turned orientation. Clay has been applied to the exterior surface, forming a distinct boundary approximately 1 cm below the lip. The apical lip displays a flattened form with a slight curvature at its center. The rim sherd has been classified as the Vertical Cordmarked variety of Lake Benton pottery, based on its surface treatment method and wall thickness.

The Lake Benton pottery collection includes a specimen identified as the Vertical Cordmarked type, cataloged as number 46. This particular artifact showcases vertical cordmarking on its outer surface, characterized by clearly defined and deeply imprinted cord lines. Although the specific type of cordage twist remains uncertain, the average diameter of the cord was measured to be 2.81 mm. The interior surface of the rim sherd exhibits a significant degree of

smoothing, which has effectively obscured the cordmarking present on its surface. The average wall thickness measured to be 4.8 mm, with a maximum thickness of 6.04 mm observed in the lip region. The unmodified rim, which is straight in shape, demonstrates a vertical orientation, while the apical lip is flattened. The act of applying pressure to the lip results in the flattening process, which in turn generates protruding edges on both the interior and exterior surfaces of the rim. Additionally, a depression is formed below the lip line on the interior side. The identification of the rim sherd as Lake Benton Vertical Cordmarked ware is based on an analysis of its exterior surface treatment and wall thickness.

The next fragment of a rim, registered by catalog number 20, displays intricate surface embellishments on both sides. Therefore, the outer surface was carefully smoothed and polished to eliminate any visible horizontal cord markings. The identification of cordmarkings is challenging due to the extensive paddling and polishing. The sherd exhibits visible horizontal striations on its interior surface, likely resulting from brushing. However, the overall texture appears smooth and polished. The rim sherd exhibited an average wall thickness of 6.35 mm, with a maximum thickness of 6.53 mm. The flattened apical lip of the unmodified, straight-shaped, and vertically oriented rim exhibits a cord impression. The rim sherd has been identified as the Horizontal Cordmarked variety of the Lake Benton pottery, based on the analysis of the surface treatment method and wall thickness.

The sole recognized instance of the Cord-wrapped Stick Impressed variant within the Lake Benton rim fragment has been documented and assigned the catalog number 31 (Figure 22). The rim sherd displays a smooth surface treatment on both its interior and exterior surfaces, with the exterior surface appearing to be smoother than the interior surface. The sherd exhibited an average wall thickness of 7.09 mm, with a maximum thickness of 7.57 mm. A sharp tool was used to create a flattened apical lip. On the interior edge of the rim, which was originally unmodified, straight-shaped, and vertically oriented, an additional oblique flat strip was created by smoothing of the edge. An oblique cord-wrapped stick impression is observed on the outer edge of the lip, extending towards the exterior surface of the rim. The identification of the rim sherd as Lake Benton Cord-wrapped Stick Impressed was made based on its decorative features and the thickness of the wall.

Loomis Pottery

Another category of Terminal Woodland pottery identified within the Eleanor collection is Loomis pottery originating from the Nelson phase. A collection comprising twenty-three fragments has been identified as Loomis pottery.

One of the primary distinguishing characteristics of Loomis Pottery is its distinct paste composition, as noted by Holley (2023:13). One prominent characteristic commonly observed in Loomis pottery is the presence of iron

pyrite within the majority of the pastes, which subsequently imparts a shiny appearance to the surfaces. The pottery fragments identified from the Eleanor site, which were analyzed for the purpose of this research, can be categorized into two distinct groups by the paste.

The initial paste type exhibits a higher degree of uniformity in its profile, characterized by the presence of similar colors in both the central region and the surfaces. The surface colors exhibit a higher degree of uniformity, lacking any discernible mottled patterns. The size of the grit particles is relatively smaller, and they are infrequently found protruding from the surface.

The color of second paste type typically exhibits variations in hue and intensity across different regions of the surfaces. Cores predominantly exhibit a variety of gray hues. The grit size is larger compared to the initial type and can be readily discerned. It is common to observe the presence of large-sized grit on protruding surfaces.

The proportion of Loomis pottery sherds analyzed for the project amounts to 17.74 percent of the total. Out of the total number of Loomis sherds examined, seven were classified as Loomis Cord Impressed, four were categorized as Loomis Broad Incised, three sherds identified as Loomis Cordmarked and eight were identified simply as Loomis without any specific variety designation. Fourteen sherds from the Loomis collection were discovered at level 1 (0-20 cm), with an additional four sherds obtained from the surface collection. A total of four pottery fragments from the Loomis culture

were recovered exclusively from level 3 and deeper, which corresponds to a depth range of 50-60 cm and below (Table 5).

Twenty-one Loomis sherds contain decorative elements. With eleven cases, tool impressions are the most common decoration type in Loomis pottery sherds. There were also seven cases of cord impressions, four incised lines, three finger impressions, two cord-wrapped tool impressions, two punctate impressions, two toothed decoration type, and one intaglio bossed decoration type identified. Some examples of Loomis pottery are described below (Table 8).

The rim fragment identified as catalog number 48 displays a brushed texture on both its inner and outer surfaces, characterized by distinct striations that can be readily identified (Figure 23). The average wall thickness measured is 5.53 mm, with a maximum thickness of 7.31 mm in the lip area. An oblique incised line is present on the exterior surface of the rim. The rim exhibits a break extending horizontally, specifically located acroos the cord impression approximately 1.5 cm below the upper edge. The shape of the rim characterized as a straight and a orientation is vertical. It is also observed that the thickness of the rim increases in the upper portion, specifically near the outer edge of the lip. The flattened lip exhibits oblique and ovate tool impressions along its apical and exterior edge. The sherd in question has been identified as a variety of the Loomis pottery known as Cord Impressed, based on its paste, surface, and lip decorations.

Another fragment of a rim, characterized by its smooth interior and exterior surfaces, has been cataloged and assigned the number 40 (Figure 24). The sherd exhibits an average wall thickness of 4.51 mm, with the lip region displaying the maximum thickness of 6.03 mm. The rim remains unmodified, maintaining a straight shape and vertical orientation. However, there is an increase in thickness in the outer lip area. The exterior surface of the sherd displays two parallel, horizontal cord impressions located approximately 5 mm below the lip line. These impressions exhibit a cordage pattern characterized by an s-twist and measure 2 mm in width. The flattened apical rim exhibits both a finger impression and an oblique tool impression. The tool created a significant depression on the lip, penetrating approximately 5 mm into the outer edge. Based on the paste, surface, and lip decoration, this sherd of Loomis pottery has been identified as belonging to of the Cord Impressed type.

A fragment of a rim, displaying smooth surfaces on both the interior and exterior, has been documented and assigned the catalog number 64 (Figure 25). Despite the application of smoothing techniques to both surfaces of the sherd, it still exhibits a rough texture characterized by the presence of large-sized grit particles that extend outward onto the surface. The rim sherd exhibited an average wall thickness of 5.59 mm, with the lip area displaying the maximum thickness of 7.81 mm. The rim fragment characterized by a straight shape and a vertical orientation. It is folded and extends about 6 mm wide, covering the exterior surface of the lip and providing additional thickness to it. Tool impressions are observed on the upper lip, specifically covering approximately half of the apical lip and the interior edge. The tool impressions

demonstrate angular and rectangular shapes when viewed from the profile, while displaying an amorphous morphology in terms of diameter. The identification of the paste and lip decoration of the rim sherd suggests that it belongs to the Loomis pottery variety.

Three rim fragments, bearing the catalog numbers 34, 76, and 98, have been positively identified as belonging to the Cormarked variety of Loomis pottery. The three distinct vessel fragments all display a cordmarked exterior surface and a smoothed interior. The recorded measurements for the average wall thickness of the sherds were 6.45 mm, 6.02 mm, and 4.32 mm, respectively. The maximum wall thickness of the sherds is 8.59 mm, 7.62 mm, and 7.04 mm, respectively. All three fragments of the rim sherd exhibit a flat apical lip.

The first rim (cat #34) exhibits straight shape and vertical orientation. Lip of the sherd folded exterior (Figure 26). There are toothed decorations on the outer lip area, which were created through the use of a pinching and impressing tool. The act of applying pressure to the outer lip area resulted in the formation of depressions on the inner lip surface. Beneath the toothed ornamentation, there exist two parallel horizontal lines consisting of impressions made by tools wrapped in a cord on the outer surface.

The second rim (cat #76) displays an unmodified structure, characterized by a straight shape and an outward-facing orientation (Figure 27). The lip of the rim is folded outward, resulting in the formation of a triangular-shaped tooth that

extends perpendicularly from the surface of the vessel. Evidence of a horizontal incised line positioned approximately 5 mm below the toothed decoration can be observed.

The third rim (cat #98) exhibits a straight shape and a vertical orientation The lip of the rim folded to the exterior, which serves the purpose of enhancing the thickness of the lip region. The boundary of the folded strip was not adequately smoothed is and clearly identifiable. The lip is adorned with a triangular or pyramid-shaped decorative pattern, characterized by tooth-like projections, which is achieved through the use of either a finger or a tool, or both. Based on the paste, cordmarked surface and toothed lip decorations all three rim sherds identified as Cordmarked variety of Loomis pottery.

The rim sherd, cataloged as number 16, demonstrates a smooth finish on both the interior and exterior sides (Figure 28). However, the exterior surface displays a texture characterized by smoothed over vertical trailed or cordmarked lines. The sherd exhibits an average wall thickness of 4.91 mm, with a maximum measured thickness of 6.06 mm. The exterior surface of the sherd has two parallel, horizontal incised lines that are broad in nature. These lines are positioned approximately 1 centimeter below the lip of the sherd and measure approximately 4 millimeters in width. There exists a distance of 3 millimeters between these parallel incisions. The unmodified rim exhibits a curved shape and a slight outward eversion. The apical lip of the rim sherd had been cut by a sharp tool, resulting in the folding of an excessive amount of clay towards the sides. The rim sherd, characterized by its paste and surface

decoration, has been identified as a specimen of the Broad Incised type within the Loomis pottery.

Onamia Series Pottery

Only one rim sherd has been identified as Onamia pottery in the analyzed Eleanor collection. The rim fragment has been recorded and assigned catalog number 38 (Figure 29). The sherd exhibits a smooth surface treatment on both its interior and exterior surfaces. The average wall thickness was determined to be 6.74 mm, with a maximum thickness of 6.81 mm. The outer surface of the pottery fragment shows a decorative pattern consisting of oblique cord-wrapped stick impressions that begin directly from the edge of the rim. The unmodified rim displays a straight form and a vertical alignment. In proximity to the lip, there is a slight thinning observed. The apical lip exhibits a flattened morphology and displays cord-wrapped stick impressions as decoration. The corners of the lips have been rendered smooth. The identification of the rim sherd as the Cord-wrapped Stick variety of the Onamia pottery is based on an analysis of its wall thickness and surface decoration.

Cambria Pottery

Out of the collection that was analyzed, it was determined that only a single fragment of a body was identified as being from Cambria pottery. A

fragment of a body sherd, has been identified and assigned the catalog number 91 (Figure 30). The exterior surface of the sherd exhibits a smoothed texture over cordmarking. The interior surface displays a level of smoothness, while the exterior surface is even smoother than the interior. The average wall thickness of the sherd was recorded as 3.83 mm. The body sherd lacks any decorative elements.

Spirit Jars

There are four rim fragments of the small sized pottery identified as spirit jars. Spirit jars are not a type of pottery in the usual sense, but rather are miniature vessels which are roughly shaped like larger jars would be, but which are often decorated in unusual ways. There are no comprehensive studies of Minnesota spirit jars to provide comparisons.

The first fragment of this particular category has been assigned catalog number 23 (Figure 31). The rim sherd exhibits a brushed texture on its external surface, characterized by the presence of multidirectional cordmarking. The cordage has been classified as possessing an s-twist configuration, with a diameter measuring 1.18 mm. The interior of the sherd exhibits a rough smoothing technique, with visible patches of excess clay layers. The sherd displays an average wall thickness of 7.29 mm, with a maximum measured thickness of 8.43 mm. Two circular punctates, each measuring approximately 3 mm in diameter, can be observed on the exterior surface of the sherd, located

approximately 7 mm below the lip. Punctates are arranged in one on another vertically, with a separation distance of 4 mm between each punctate. The unmodified rim demonstrates a straight configuration and a slight outward curvature in the lip area. Additionally, the lip region exhibited a reduction in thickness, while the apical lip displayed a rounded form.

The next spirit jar has been assigned a number designation of 15 (Figure 32). The rim sherd displays a consistent and smoothed finish on both its inner and outer surfaces. The sherd exhibited an average wall thickness of 4.24 mm, with a maximum thickness of 5.88 mm. There are three amorphous-shaped impressions observed on the exterior surface of the rim, which are likely the result of impressing with fibers or other unfamiliar objects. The unmodified rim displays a slight outward eversion and maintains a straight configuration. The apical lip is flattened and, as a consequence of the finger impression, it protrudes outward.

The final fragment of the Spirit Jar rim within the studied collection has been assigned the catalog number 22. This particular fragment exhibits smoothed surfaces on both sides. Measured average wall thickness of the sherd is 4.24 mm, with a maximum thickness of 6.05 mm. The rim form known as S-rims can be identified by its curved shape and everted rim. The uppermost part of the rim rolled exteriorly, resulting in a thicker lip and a rounded appearance on the apical region.

Unidentified Pottery

The assemblage consists primarily of unidentified pottery sherds, predominantly small fragments measuring less than 1 cm. These sherds lack any discernible diagnostic characteristics or exhibit features that do not align with the established typology of pottery matrices. The collection, consisting of forty fragments, includes unidentified pottery. The percentage of unidentified pottery sherds that were examined for the project constitutes 32.26% of the overall sample. A total of twenty-one pottery fragments, specifically rim sherds, were identified in this research, accounting for approximately 27.63 percent of the overall rim sherds analyzed. Among the entirety of the unidentified sherds that were analyzed, a total of twenty-two exhibited a cordmarked surface. One of the sherds was identified as s-twist cordage, while another was identified as z-twist cordage. However, the twist type of the remaining twenty unidentified sherds remains undetermined. A total of twenty sherds from the unidentified collection were recovered at level 1 (0-20 cm), with one sherd found at level 2 (20-23 cm), another sherd at level 3 (50-60 cm), three pieces at level 4 (60-70 cm), and eight sherds at level 5 (70-80 cm). Additionally, seven sherds were obtained from the surface collection (Table 5).

A total of twenty-seven sherds that was not possible to identify exhibit decorative elements. A total of eight cord impressions, six cord-wrapped tool impressions, six tool impressions, two finger impressions, one punctate impression, one dentate stamped impression, one toothed impression, one incised line, and one intaglio bossed decoration type were identified on the

Unidentified pottery sherds (Table 8). Below are descriptions of several examples of unidentified pottery.

Rim sherd number 79 in the catalog displays vertical cordmarking on its outer surface and a smooth texture on its inner surface (Figure 33). The cordage exhibited an average width of 3.91 mm, with an indeterminate twist type. The rim sherd exhibits an average wall thickness of 4.12 mm, with a maximum thickness of 5.71 mm. The rim with a curved shape demonstrates a vertical orientation. The lip of the rim is compressed, thinned, and vertically raised by a tool or finger from the interior side, resulting in the “tabbed” appearance.

An additional rim sherd, labeled as catalog number 50, displays a smoothed exterior surface and a smoothed over cordmarked interior surface (Figure 34). The average wall thickness of the rim sherd was determined to be 7.14 mm, with a maximum thickness of 7.24 mm. The unmodified rim exhibits a curved form and a slightly inverted orientation. The exterior edge and apical lip of the rim exhibit deep oblique tool impressions. The apical lip of the rim was flattened prior to the application of the tool impressions.

Three fragments of a rim that fit together were discovered in different excavation units and were assigned catalog number 94 (Figure 35). The exterior surfaces of the sherds exhibit a horizontal cordmarked treatment that has been smoothed over, while the interior surfaces display a smoothed texture. The determination of cordage twist type and diameter is challenging due to the presence of heavy smoothing. The average wall thickness of the

sherds is 5.53 mm, with a measured maximum thickness of 5.8 mm. The unmodified rim exhibits a curved shape and a slightly turned-out orientation. The apical lip of the rim is flattened, and the corners have been smoothed.

The next unidentified fragment of a rim, designated as catalog number 68, displays a smoothed surface treatment on both its inner and outer surfaces. The rim sherd exhibits an average wall thickness of 5.33 mm, with a maximum measured thickness of 5.57 mm. The unmodified rim displays a curved configuration and an outwardly turned orientation in the lip area. The apical lip of the rim is flattened, and the interior and exterior edges of the lip have been smoothed.

The rim fragment identified by catalog number 61 exhibits a cordmarked surface treatment that has been smoothed over on the exterior surface, while the interior surface remains smooth. The rim sherd’s calculated average wall thickness is 5.52 mm, with a maximum thickness of 6.21 mm. This unidentified rim fragment has amorphous-shaped traces of tool or object impressions on its interior surface. The unmodified, straight shaped rim demonstrates a vertical alignment. There is a cord-wrapped tool impression on the flattened apical lip.

Catalog number 117 was assigned to another unidentified rim with an exfoliated interior surface. The rim fragment's exterior surface has been smoothed. The rim sherd is curved and everted slightly. The rim exhibits a folded exterior and rounded apical lip. The folded strip's edge was not smoothed and is easily identifiable.

The body sherd with catalog number 49 displays smoothed surface on both exterior and interior surfaces. The average measured thickness of the sherd is 7.91 mm. The body sherd exhibits horizontal and oblique cord impressions on its external surface. The cordage was identified as having an S-twist configuration with a cord diameter of 1.24 mm.

Another body sherd with smoothed over vertical cordmarking on the exterior surface is cataloged as 78. The interior of the body sherd was smoothed out. While the twist type of the cordage was undetermined, the cord diameter was 3.65 mm wide. The sherd's average wall thickness measured as 5.57 mm.

The smoothing over cordmarked surface treatment on the exterior surface of the body sherd with catalog number 119 is observed. The present sherd's interior has been smoothed. The sherd's average wall thickness measured 4.98 mm.

CHAPTER 5: DISCUSSION AND CONCLUSION

The analysis of the pottery assemblage conducted for this thesis facilitates an initial comprehension of the archaeological context of the Eleanor site. The analysis of excavations conducted at the Eleanor site, along with the examination of its pottery, yields several overarching conclusions.

The research presents evidence that highlights the diverse range of pottery found at the Eleanor site. The significance of the Eleanor site stems from its role as a hub for cultural exchange and interaction between different ecological areas, as evidenced by the wide array of pottery styles and the extensive history of human habitation spanning the Middle and Initial Woodland periods, as well as the Terminal Woodland period.

In general, the pottery collections recovered during the archaeological investigations conducted at the Eleanor site in 1976, 1977, and 1978 demonstrate a significant association with cultural groups belonging to the Middle/Initial Woodland period, which have been recognized and characterized in the Prairie Lake and Southeast Archaeological regions. The presence of pottery types indicates the influence of Middle Woodland culture originating from Central Illionis River valley and extending into the southeast Minnesota through west-central Wisconsin. The Terminal Woodland pottery types obtained from Eleanor site seem to signal a degree of cultural continuity during the period.

The presence of distinct variations of Middle Woodland Havanoid pottery types identified in Minnesota, such as those found in Howard Lake and Sorg, suggests that the Eleanor site's inhabitants were active participants in a regional interaction network. The expansion of the interaction region of the Eleanor location is further broadened through the utilization of a diverse range of general Havanoid pottery, including the Naples stamped and Naples Dentate types. There exists substantial evidence supporting the notion of down-the-line transfer of Knife River Flint across North Dakota, traversing Minnesota, and extending into Wisconsin during the Middle Woodland period (Clark 1984:173; Michlovic 1990:47). It is possible that the Eleanor site played a significant role in the interaction chain during the Middle Woodland period, given the strong Havanoid character of the pottery, and particularly its Illinois cast. An examination of the lithic material recovered from the Eleanor site would provide further clarification regarding this assertion.

The abundance and diversity of Havanoid pottery types in the Eleanor location , suggestits introduction through exchange and trade networks. The quantity and observed characteristics of this particular pottery do not provide sufficient evidence to establish the presence of a distinct, localized Havanoid pottery style.

A total amount of twenty-one out of the twenty-five Havanoid sherds was obtained either from level 1, which corresponds to a depth of 0-20 cm or was collected directly from the surface of the surveyed area. A total of four pottery fragments were unearthed in the lower strata (Table 5). The co-occurrence of

Terminal Woodland pottery types alongside Middle Woodland Havanoid pottery can be attributed to the phenomenon of cultural layer mixing. The observed pattern of mixing of layers in the Eleanor site excavation area is likely attributed to the intensive agricultural activities that took place prior to the commencement of the excavation. Consequently, the determination of the chronological sequence of Havanoid pottery types at the Eleanor site can solely be achieved by means of comparing and describing them in relation to established Havanoid pottery types.

The pottery found at the Eleanor site with the Initial Woodland period attributes exhibited characteristics consistent with the Fox Lake pottery types commonly observed throughout the Prairie Lake Archaeological Region. In contrast to Havanoid pottery types, the Fox Lake pottery discovered at the Eleanor site demonstrates a notable level of consistency and uniformity. According to the findings outlined in the results section, it was determined that five out of the eight Fox Lake pottery sherds that were identified belonged to the Vertical Cordmarked type. The three remaining fragments are typically classified as Fox Lake pottery, without further specification regarding their distinct type. The observed outcome aligns with the spatial distribution pattern of the Fox Lake pottery within the Prairie Lake Archaeological region. As Anfinson indicates, Fox Lake Trailed pottery type gets less common to the west and north of the region, contrary Vertical Cordmarked type becomes dominant (Arzigian 2008:67).

Interestingly, one of the body sherds (cat #73) identified as Fox Lake, exhibits trailed line over cordmarked body. Anfinson made parallels between trailed over cordmarked Fox Lake pottery with Early Woodland types, such as Black Sand (Anfinson 1997:57; Anfinson and Wright 1990:219). Trailed over cordmarked Fox Lake pottery, considered the earliest type of Fox Lake pottery, sometimes dated back to the Early Woodland period. According to Anfinson (1997:58), later, the influence of Havana resulted in certain deviations from the characteristics commonly associated with the Early Woodland period, such as the presence of thick walls, cordmarked exteriors, trailing, and bossing. The presence of cordwrapped stick and dentate impressions in the archaeological record suggests the influence of Havana culture. However, there is limited evidence supporting the existence of other formal Havana traits, such as zoning, ovoid or crescent stamps, and beveled lips.

Nevertheless, the Fox Lake pottery from the Eleanor site does not exhibit any of the Havana-influenced characteristics mentioned above. On the other hand, the collection frequently exhibits traditional Fox Lake characteristics, including a cordmarked exterior, bossing, and trailing.

The examined collection confirms another distribution pattern of the Fox Lake pottery. Literature indicates that, while Fox Lake ceramics are widely distributed in Prairie Lake Archeological Region, they do not exhibit a dominant presence beyond their core region (Holley and Michlovich 2013:166). Upon conducting a comparative analysis of the quantity of pottery fragments from Fox

Lake and Havanoid, it becomes evident that Havanoid pottery constitutes approximately three quarters of the Middle/Initial Woodland specimens.

The stratigraphic distribution witnessed in Havanoid pottery fragments at the Eleanor site was replicated in the distribution of Fox Lake pottery. Consequently, a total of three out of the eight Fox Lake sherds were retrieved exclusively from levels 3 (50-60 cm) and 4 (60-70 cm), while the remaining five sherds were obtained from level 1, and the surface area of the excavation site (Table 5). The current circumstances render the analysis of stratigraphic relationships between Fox Lake pottery and other pottery types, specifically synchronous Havanoid pottery, unfeasible.

The evidence of internal uniformity observed on the Fox Lake pottery specimens found at the Eleanor site, along with the overall pattern of distribution of this pottery type in the Prairie Lake Archaeological region, suggests that Fox Lake pottery, specifically those displaying the Vertical Cordmarked style, were manufactured within the local area.

Similar to the Initial Woodland Fox Lake pottery, Terminal Woodland period, Lake Benton pottery found at the Eleanor site exhibits a notable level of internal consistency. Out of the total of twenty-three pottery fragments discovered in Lake Benton, it was observed that twenty of them exhibit a cordmarked surface. Furthermore, sixteen of these fragments were identified as belonging to the Vertical Cordmarked type. There is only one example present for each of the Lake Benton Horizontal Cordmarked and Lake Benton Cord-wrapped Stick Impressed types. Nevertheless, the prevalence of the

Vertical Cordmarked type at the Eleanor site is not consistent with the geographic frequency of Lake Benton pottery. The archaeological data obtained from the Prairie Lake region reveals that the existence of the Cord-wrapped Stick Impressed type is observed across nearly all sites. However, there is a noticeable increase in the proportion of the Vertical Cordmarked type as the pattern moves from east to west (Anfinson 1997:77-79). If considered that the geographical location of the Eleanor site corresponds to the north-west of the region, it can be inferred that the presence of the Vertical Cordmarked type in the collection is expected to be relatively lower. The unique distribution of pottery styles from Fox Lake phase found at Eleanor might be attributed to either the brief presence of Fox Lake inhabitants at the site or the peripheral positioning of the Eleanor in the Fox Lake region.

The existence of the single-twisted cord impressed pottery in the Prairie Lake Archeological region has only recently been discussed in the archeological literature. Recently, Holley (2023) proposed a new categorization of this type of pottery for the region. Based on the Nelson site collection, Nelson phase and Loomis Ceramic Series were established. A total of 17.74 percent of the pottery fragments analyzed for this research correspond with the different variations of the Loomis pottery. Proportions between types of Loomis Broad Incised (4), Loomis Cordmarked (3), Loomis Cord Impressed (7), and generally identified as Loomis pottery (8) evenly distributed compared to Fox Lake and Lake Benton. Distinct paste and decorative elements of the Loomis pottery, such us single-twisted cord impressions, incised lines, and tool impressions

observed on collection from Eleanor site. Also, data from the Eleanor site indicates that there may be two distinct paste types in the Loomis pottery.

The mixing of archeological layers as a result of modern, intensive agricultural activity makes determining the stratigraphic relationship between Havanoid and Fox Lake pottery types impossible. Furthermore, deficiencies in the excavation process documentation complicate the exploration of the artifacts' archeological context. That is the reason why, the simultaneous or asynchronous presence of Havanoid and Fox Lake pottery types remains unclear.

However, the geographical and typological diversity of Havanoid pottery types and the uniformity of Fox Lake pottery allow us to conclude that the latter is manufactured locally and the former is imported. The general assumption that Havanoid influence resulted in stylistic changes in Fox Lake pottery can not be tracked by the studied collection. Eleanor's Fox Lake pottery lacks any Havanoid traits. The presence of these two distinct cultural phases in Eleanor during various periods in time could be the explanation for this phenomenon.

The presence of a diverse range of pottery types at the Eleanor site is indicative of the prolonged and recurrent occupation of the site by various cultural groups throughout different periods. This observation further implies the possibility of a significant level of cultural interaction and exchange between the neighboring groups. The analysis of the pottery collection suggests that the residents of Eleanor participated in interregional exchange activities between

the Prairie and Woodland ecozones. However, there is a lack of evidence indicating any significant cultural blending.

The data that has been analyzed in this research offers an initial comprehension of the Eleanor site. However, additional research is required in order to gain a more comprehensive understanding of the site and the interaction between the Fox Lake and Havanoid phases. The utilization of faunal and botanical analysis can provide valuable insights into the subsistence patterns of a given site, while the application of lithic analysis can enhance the initial comprehension of the cultural affiliation associated with site. Dating of soil samples, which present on Eleanor collection, would serve to clarify the chronological framework.

REFERENCES CITED

Anderson Publishing Co.

1927 Atlas of Nicollet County, Minnesota and the World (1927). Nicollet County Historical Society, collection.mndigital.org/catalog/nico:2488 Accessed 14 July 2023.

Anderson, J. B.

2018 A macromorphological analysis of end scrapers from sites associated with two phases of the Oneota tradition, the Blue Earth and Spring Creek, in Southern Minnesota [Master's thesis, Minnesota State University, Mankato]. Cornerstone: A Collection of Scholarly and Creative Works for Minnesota State University, Mankato. https://cornerstone.lib.mnsu.edu/etds/1250/

Anfinson, Scott

1979 *Handbook of Minnesota Prehistoric Ceramics.* Occasional Publications in Minnesota Anthropology, 5. St. Paul: Minnesota Archaeological Society

1987 The Prehistory of the Prairie Lake Region in the Northeastern Plains. (Unpublished master's thesis). University of Minnesota, Twin Cities.

1990 Archaeological Regions in Minnesota and the Woodland Period. Guy Gibbon (Ed.). The Woodland Tradition in the Western Great Lakes:

Papers Presented to Elden Johnson [Special Issue] University of Minnesota Publications in Anthropology No. 4, pp. 135-166.

1997 Southwestern Minnesota Archeology: 12,000 years in the Prairie Lake Region. St Paul. Minnesota Historical Society.

1999 *Prairie, lakes & people: the archeology of southwestern Minnesota*. Southwest State University, Marshall.

Anfinson, Scott, and H. Wright

1990 Climatic Change and Culture in Prehistoric Minnesota. In *The Woodland Tradition in the Western Great Lakes: Papers Presented to Elden Johnson*, edited by G. E. Gibbon, pp. 213–232. University of Minnesota Publications in Anthropology No. 4. University of Minnesota, Minneapolis.

Arzigian, Constance Marie

2008 *Minnesota Statewide Multiple Property Documentation Form for the Woodland Tradition*. Mississippi Valley Archeology Center. Submitted to the Minnesota Department of Transportation, Agreement No. 89964.

Austin A. Buhta, Craig M. Johnson, Eric C. Grimm, L. Adrien Hannus, & Timothy V. Gillen

2014 *On the Periphery?: Archaeological Investigations of the Woodland Tradition in West-Central Minnesota.* Archaeogical Contract Series

269, Prepared for: The Oversight Board of the Statewide Survey of Historical and Archaeological Sites and the Minnesota Historical Society

Baker, R. G., E. A. Bettis, III, R. F. Denniston, L. A. Gonzalez, L. E. Stickland, and J. R. Krieg

2002 Holocene Paleoenvironments in Southeastern Minnesota: Chasing the Prairie-Forest Ecotone. *Palaeogeography, Palaeoclimatology, Palaeoecology* 177:103-122.

Bonney A. Rachel

1970 Early Woodland in Minnesota, Plains Anthropologist, 15:50, 302-304

Bradley Edward Perkl

2009 The late Archaic-Early Woodland transition in Southeastern Minnesota.. Retrieved from the University of Minnesota Digital Conservancy, https://hdl.handle.net/11299/58730.

Braun P. David

1985 Ceramic Decorative Diversity and Illinois Woodland Regional Integration. In: Decoding Prehistoric Ceramics

Clark, F.

1984 Knife river flint and interregional exchange. Midcontinental Journal of Archaeology, 9(2), 173–198. http://www.jstor.org/stable/20707930

Farnsworth, Kenneth B.

2009 'The Woodland Period', in Alice Berkson and Michael D. Wiant (eds.), *Discover Illinois Archeology* (Illinois Association for Advancement of Archeology and the Illinois Archaeological Survey).

Gibbon E. Guy

2012 *Archeology of Minnesota the prehistory of the upper Mississippi river region*. University of Minnesota Press.

Gibbon E. Guy and Christy A. H. Caine

1980 The Middle to Late Woodland transition in eastern Minnesota// *Midcontinental Journal of Archeology*, 1980, Vol. 5, No. 1, pp. 57-72

Gibbon E. Guy

1986 Does Minnesota have an Early Woodland? In early woodland archeology: Vol. v. 2 (pp. 84–91). Center for American Archaeology Press. https://ehrafarchaeology.yale.edu/document?id=nn60-013

Grimm, Eric C.

1983 Chronology and Dynamics of Vegetation Change in the Prairie-Woodland Region of Southern Minnesota, U.S.A. *New Phytologist* 93(2):311-350.

Haynes & Woodard

1885 Map of Nicollet County, Minnesota. 1885. Nicollet County Historical Society, collection.mndigital.org/catalog/nico:2257 Accessed 15 July 2023.

Historical Aerial Photographs Online (MHAPO)

2015 Minnesota Historical Aerial Photographs Online. Electronic document, https://www.lib.umn.edu/apps/mhapo/, accessed April 4, 2015.

Hobbs Elizabeth

Mn/Model: An Archaeological Predictive Model for Minnesota. https://proceedings.esri.com/library/userconf/proc97/proc97/to200/pap151/p151.htm#:~:text=The%20model%20predicts%20the%20probability,a%20composite%20of%20regional%20models Accessed 16 July 2023

Holley George. R.

2023 Cord Impressed Decoration and the Emergence of the Late Prehistoric. Unpublished paper.

Holley, George R. and Michael G. Michlovic

2013 *The Prehistoric Village Cultures of Southern Minnesota*. Manuscript on file at the Minnesota Office the State Archaeologist, St. Paul.

Hudak G. Joseph

1978 A Description of the Early Middle Woodland Ceramics from the Pedersen Site in Southwestern Minnesota. In Some Studies of Minnesota Prehistoric Ceramics: Papers Presented at the First Council for Minnesota Archaeology Symposium 1976, edited by A. Woolworth and M. Hall, pp. 27–34. Occasional Publications in Minnesota Anthropology No. 2. Minnesota Archaeological Society, St. Paul.

Hudak, G. Joseph

1976 Woodland ceramics from the Pedersen site // *Scientific Publications of the Science Museum of Minnesota*, New Series Vol. 3, No. 2.

Hudak, G. Joseph, and Elden Johnson

1975 An Early Woodland Pottery Vessel from Minnesota. Scientific Publications of the Science Museum of Minnesota, New Series 2-4.Huggett, J.

2022 Computer Applications in Archeology. *In The Encyclopedia of Archaeological Sciences, S.L. López Varela (Ed.).* https://doi.org/10.1002/9781119188230.saseas0108

Johnson Elden

1959 Spring Lake Archaeology: The Sorg Site. Science Bulletin, No. 3, Part 3, The Science Museum of the St. Paul Institute, St. Paul.

Mason J. Ronald

1990 Lawton Site and the Havana Shadow In Northeastern Wisconsin. The Woodland Tradition in the Western Great Lakes: Papers Presented to Elden Johnson [Special Issue] University of Minnesota Publications in Anthropology No. 4, pp. 19-31

Michlovic G. Michael

1990 Northern Plains-Woodland Interaction In Prehistory. Guy Gibbon (Ed.). The Woodland Tradition in the Western Great Lakes: Papers Presented to Elden Johnson [Special Issue] University of Minnesota Publications in Anthropology No. 4, pp. 45-55

Minnesota DNR–Division of Forestry

1999 Ecological Subsections of Minnesota. Minnesota Department of Natural Resources. Electronic document, http://deli.dnr.state.mn.us/ downloaded August 2023.

Minnesota Geospatial Information Office

2023 GLO Historic Plat Map Retrieval System. Electronic Document, https://www.mngeo.state.mn.us/glo/glo.php?township=110&range=29 accessed August 1, 2023.

Mollerud, Kate. J.

2016 The Cambria connection: Identifying ceramic production and community interaction in late prehistoric Minnesota, AD 1050--1300. https://dc.uwm.edu/etd/1178

Neubauer, W.

2004 GIS in archeology—the interface between prospection and excavation // *Archeol. Prospect., 11: 159-166*. https://doi.org/10.1002/arp.231

North West Publishing Co.

1899 Plat Book of Nicollet County, Minnesota (1899). 1899 Nicollet County Historical Society, collection.mndigital.org/catalog/nico:2012 Accessed 30 July 2023.

Reichel, J.

2015 Revisiting the Nelson Site: Recent Archeological Investigations and Material Analysis [Master's thesis, Minnesota State University, Mankato]. Cornerstone: A Collection of Scholarly and Creative Works for Minnesota State University, Mankato. https://cornerstone.lib.mnsu.edu/etds/510/

Ryan J. Howell

2001 *Common Woodland Period Prehistoric Ceramics of Western Wisconsin.* Archaeological resource management series laboratory manual no. 1. United States Army Reserve Command Fort Mccoy Directorate of Training And Mobilization Archeology Laboratory

Shepard, A. O.

1956 Ceramics for the archaeologist Publication / Carnegie Institution of Washington.

Skinner, J. A.

2018 *Understanding Complex Late and Terminal Woodland Sites in the Red Wing, Minnesota, Area [Master's thesis, Minnesota State University, Mankato]*. Cornerstone: A Collection of Scholarly and Creative Works for Minnesota State University, Mankato. https://cornerstone.lib.mnsu.edu/etds/771/

Struever, S.

1965 Middle Woodland Culture History in the Great Lakes Riverine Area // *American Antiquity, 31(2), 211–223*. https://doi.org/10.2307/2693986

Webb Publishing Co.

1913 Atlas of Nicollet County Minnesota 1913. Nicollet County Historical Society, collection.mndigital.org/catalog/nico:2317 Accessed 2 Aug. 2023.

Wilford, L. A.

1941 A Tentative Classification of the Prehistoric Cultures of Minnesota. *American Antiquity*, *6*(3), 231–249. https://doi.org/10.2307/275541

APPENDIX A: TABLES

Depth	Surface		Level 1: 0-20 cm		Level 2: 20-23 cm		Level 3: 50-60 cm		Level 4: 60-70 cm		Level 5: 70-80 cm		Total	
Surface Treatment (Exterior)	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
brushed	1	2,50%		0,00%		0,00%		0,00%	1	14,29%		0,00%	2	**1,61%**
brushed over cordmarking	1	2,50%	1	1,82%		0,00%		0,00%		0,00%		0,00%	2	**1,61%**
brushing over multidirectional cordmarking		0,00%		0,00%		0,00%	1	11,11%		0,00%		0,00%	1	**0,81%**
exfloited		0,00%	1	1,82%		0,00%		0,00%	1	14,29%		0,00%	2	**1,61%**
indeterminate		0,00%	2	3,64%		0,00%		0,00%		0,00%		0,00%	2	**1,61%**
paddling/burnishing over horizontal cordmarking		0,00%	1	1,82%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
smooth	14	35,00%	10	18,18%		0,00%	1	11,11%	1	14,29%	4	36,36%	30	**24,19%**
smoothed over cordmarking	13	32,50%	12	21,82%	1	50,00%	1	11,11%	3	42,86%	6	54,55%	36	**29,03%**
smoothed over cord-wrapped tool impression	1	2,50%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
smoothed over horizontal cordmarking		0,00%	2	3,64%		0,00%		0,00%		0,00%		0,00%	2	**1,61%**
smoothed over multidirectional cordmarking	2	5,00%	2	3,64%		0,00%		0,00%		0,00%		0,00%	4	**3,23%**
smoothed over vertical cordmarking	8	20,00%	17	30,91%		0,00%	4	44,44%		0,00%	1	9,09%	30	**24,19%**
smoothed over vertical cordmarking		0,00%	6	10,91%	1	50,00%	1	11,11%	1	14,29%		0,00%	9	**7,26%**
smoothed over vertical trailing		0,00%	1	1,82%		0,00%	1	11,11%		0,00%		0,00%	2	**1,61%**
Grand Total	**40**	**100,00 %**	**55**	**100,00 %**	**2**	**100,00 %**	**9**	**100,00 %**	**7**	**100,00 %**	**11**	**100,00 %**	**124**	**100,00 %**

Table 1: Surface treatment count and percentage by excavation level

Depth	Surface		Level 1: 0-20 cm		Level 2: 20-23 cm		Level 3: 50-60 cm		Level 4: 60-70 cm		Level 5: 70-80 cm		Total #	Total %
Surface Treatment (Exterior)	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**		
brushed over cordmarking		0,00%	1	4,76%		0,00%		0,00%		0,00%		0,00%	1	**2,08%**
indeterminate		0,00%	1	4,76%		0,00%		0,00%		0,00%		0,00%	1	**2,08%**
smooth	3	23,08%	4	19,05%		0,00%		0,00%	1	25,00%	1	14,29%	9	**18,75%**
smoothed over cordmarking	8	61,54%	8	38,10%		0,00%	1	50,00%	2	50,00%	5	71,43%	24	**50,00%**
smoothed over cord-wrapped tool impression	1	7,69%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**2,08%**
smoothed over multidirectional cordmarking	1	7,69%	2	9,52%		0,00%		0,00%		0,00%		0,00%	3	**6,25%**
smoothed over vertical cordmarking		0,00%		0,00%		0,00%		0,00%		0,00%	1	14,29%	1	**2,08%**
smoothed over vertical cordmarking		0,00%	5	23,81%	1	100,00%	1	50,00%	1	25,00%		0,00%	8	**16,67%**
Grand Total	**13**	**100,00%**	**21**	**100,00%**	**1**	**100,00%**	**2**	**100,00%**	**4**	**100,00%**	**7**	**100,00%**	**48**	**100,00%**

Table 2: Body sherds surface treatment count and percentage by excavation level

Twist Type	Count of Twist Type	Percentage of Twist Type
indeterminate	67	77,01%
s-twist	16	18,39%
z-twist	4	4,60%
Grand Total	**87**	**100,00%**

Table 3 : Twist type statistics

Depth	Surface		Level 1: 0-20 cm		Level 2: 20-23 cm		Level 3: 50-60 cm		Level 4: 60-70 cm		Level 5: 70-80 cm		Total	
Surface Treatment (Exterior)	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
brushed	1	3,70%		0,00%		0,00%		0,00%	1	33,33%		0,00%	2	**2,63%**
brushed over cordmarking	1	3,70%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**1,32%**
brushing over multidirectional cordmarking		0,00%		0,00%		0,00%	1	14,29%		0,00%		0,00%	1	**1,32%**
exfloited		0,00%	1	2,94%		0,00%		0,00%	1	33,33%		0,00%	2	**2,63%**
indeterminate		0,00%	1	2,94%		0,00%		0,00%		0,00%		0,00%	1	**1,32%**
paddling/burnishing over horizontal cordmarking		0,00%	1	2,94%		0,00%		0,00%		0,00%		0,00%	1	**1,32%**
smooth	11	40,74%	6	17,65%		0,00%	1	14,29%		0,00%	3	75,00 %	21	**27,63%**
smoothed over cordmarking	5	18,52%	4	11,76%	1	100,00%		0,00%	1	33,33%	1	25,00 %	12	**15,79%**
smoothed over horizontal cordmarking		0,00%	2	5,88%		0,00%		0,00%		0,00%		0,00%	2	**2,63%**
smoothed over multidirectional cordmarking	1	3,70%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**1,32%**
smoothed over vertical cordmarking	8	29,63%	17	50,00%		0,00%	4	57,14%		0,00%		0,00%	29	**38,16%**
smoothed over vertical cordmarking		0,00%	1	2,94%		0,00%		0,00%		0,00%		0,00%	1	**1,32%**
smoothed over vertical trailing		0,00%	1	2,94%		0,00%	1	14,29%		0,00%		0,00%	2	**2,63%**
Grand Total	**27**	**100,00%**	**34**	**100,00%**	**1**	**100,00%**	**7**	**100,00%**	**3**	**100,00%**	**4**	**100,00%**	**76**	**100,00%**

Table 4: Rim sherds surface treatment count and percentage by excavation level

Depth	Surface		Level 1 : 0-20		Level 2 : 20-23		Level 3 : 50-60		Level 4 : 60-70		Level 5 : 70-80		Total	
Affiliation	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Cambria		0,00%	1	1,82%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
Cambria Total		**0,00%**	**1**	**1,82%**		**0,00%**		**0,00%**		**0,00%**		**0,00%**	**1**	**0,81%**
Fox Lake	2	5,00%		0,00%		0,00%		0,00%	1	14,29%		0,00%	3	**2,42%**
Fox Lake Vertical Cordmarked	2	5,00%	1	1,82%		0,00%	2	22,22%		0,00%		0,00%	5	**4,03%**
Fox Lake Total	**4**	**10,00%**	**1**	**1,82%**		**0,00%**	**2**	**22,22%**	**1**	**14,29%**		**0,00%**	**8**	**6,45%**
Havanoid	3	7,50%	11	20,00%	1	50,00%		0,00%	2	28,57%		0,00%	17	**13,71%**
Havanoid - Howard Lake	2	5,00%	1	1,82%		0,00%		0,00%		0,00%	1	9,09%	4	**3,23%**
Havanoid - Naples Dentate Stamped	1	2,50%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
Havanoid - Naples Stamped	1	2,50%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
Havanoid -Naples Stamped (cord-wrapped stick)	1	2,50%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
Havanoid -Sorg Banded Dentate	1	2,50%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
Havanoid Total	**9**	**22,50%**	**12**	**21,82%**	**1**	**50,00%**		**0,00%**	**2**	**28,57%**	**1**	**9,09%**	**25**	**20,16%**
Lake Benton	1	2,50%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
Lake Benton Cordmarked	2	5,00%		0,00%		0,00%	1	11,11%	1	14,29%		0,00%	4	**3,23%**
Lake Benton Cord-wrapped Stick Impressed	1	2,50%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
Lake Benton Horizontal Cordmarked		0,00%	1	1,82%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
Lake Benton Vertical Cordmarked	9	22,50%	6	10,91%		0,00%	1	11,11%		0,00%		0,00%	16	**12,90%**
Lake Benton Total	**13**	**32,50%**	**7**	**12,73%**		**0,00%**	**2**	**22,22%**	**1**	**14,29%**		**0,00%**	**23**	**18,55%**
Loomis	1	2,50%	6	10,91%		0,00%	1	11,11%		0,00%		0,00%	8	**6,45%**
Loomis Broad Incised		0,00%	4	7,27%		0,00%		0,00%		0,00%		0,00%	4	**3,23%**

Loomis Cord Impressed	3	7,50%	2	3,64%		0,00%	1	11,11%		0,00%	1	9,09%	7	**5,65%**
Loomis Cordmarked	1	2,50%	1	1,82%		0,00%	1	11,11%		0,00%		0,00%	3	**2,42%**
Loomis Total	**5**	**12,50%**	**13**	**23,64%**		**0,00%**	**3**	**33,33%**		**0,00%**	**1**	**9,09%**	**22**	**17,74%**
Onamia Cord-wrapped Stick Impressed	1	2,50%		0,00%		0,00%		0,00%		0,00%		0,00%	1	**0,81%**
Onamia Total	**1**	**2,50%**		**0,00%**		**0,00%**		**0,00%**		**0,00%**		**0,00%**	**1**	**0,81%**
Spirit Jar	1	2,50%	1	1,82%		0,00%	1	11,11%		0,00%	1	9,09%	4	**3,23%**
Spirit Jar Total	**1**	**2,50%**	**1**	**1,82%**		**0,00%**	**1**	**11,11%**		**0,00%**	**1**	**9,09%**	**4**	**3,23%**
Unidentified	7	17,50%	20	36,36%	1	50,00%	1	11,11%	3	42,86%	8	72,73%	40	**32,26%**
Unidentified Total	**7**	**17,50%**	**20**	**36,36%**	**1**	**50,00%**	**1**	**11,11%**	**3**	**42,86%**	**8**	**72,73%**	**40**	**32,26%**
Grand Total	**40**	**100,00 %**	**55**	**100,00 %**	**2**	**100,00 %**	**9**	**100,00 %**	**7**	**100,00 %**	**11**	**100,00 %**	**124**	**100,00 %**

Table 5 : Udentified cultural affiliations by excavation level

Twist Type	indeterminate		s-twist		z-twist		Total	
Affiliation	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Cambria	1	100,00%		0,00%		0,00%	1	**100,00%**
Fox Lake	1	33,33%	2	66,67%		0,00%	3	**100,00%**
Fox Lake Vertical Cordmarked	3	60,00%	2	40,00%		0,00%	5	**100,00%**
Havanoid	12	100,00%		0,00%		0,00%	12	**100,00%**
Havanoid - Howard Lake	3	100,00%		0,00%		0,00%	3	**100,00%**
Havanoid - Naples Stamped		0,00%	1	100,00%		0,00%	1	**100,00%**
Lake Benton		0,00%		0,00%	1	100,00%	1	**100,00%**
Lake Benton Cordmarked	1	25,00%	1	25,00%	2	50,00%	4	**100,00%**
Lake Benton Horizontal Cordmarked	1	100,00%		0,00%		0,00%	1	**100,00%**
Lake Benton Vertical Cordmarked	8	50,00%	8	50,00%		0,00%	16	**100,00%**
Loomis	7	100,00%		0,00%		0,00%	7	**100,00%**
Loomis Broad Incised	3	100,00%		0,00%		0,00%	3	**100,00%**
Loomis Cord Impressed	3	100,00%		0,00%		0,00%	3	**100,00%**
Loomis Cordmarked	3	100,00%		0,00%		0,00%	3	**100,00%**
Spirit Jar	1	50,00%	1	50,00%		0,00%	2	**100,00%**
Unidentified	20	90,91%	1	4,55%	1	4,55%	22	**100,00%**
Grand Total	**67**	**77,01%**	**16**	**18,39%**	**4**	**4,60%**	**87**	**100,00%**

Table 6: Twist type statistics by cultural affiliation

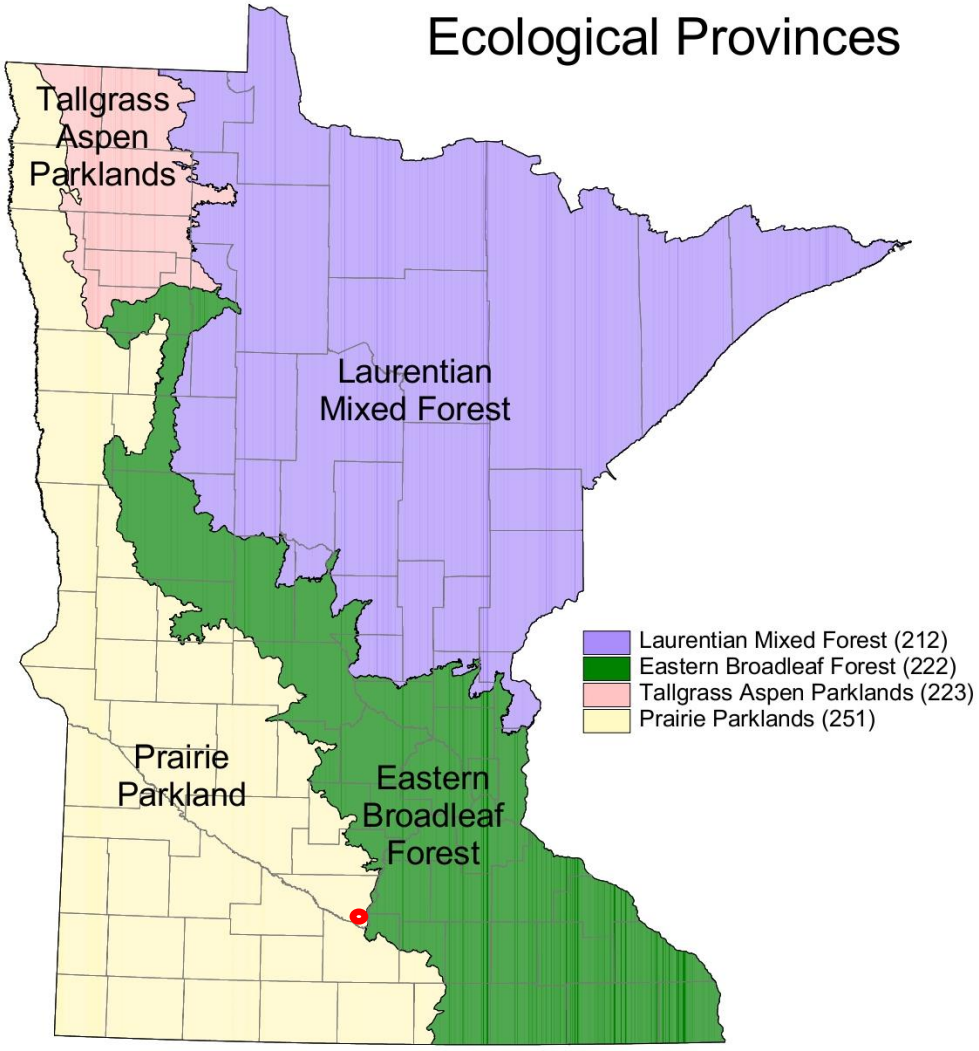
Affiliation	#	%
Fox Lake	**4**	**5,26%**
Fox Lake Vertical Cordmarked	4	**5,26%**
Havanoid	**10**	**13,16%**
Havanoid	3	**3,95%**
Havanoid - Howard Lake	3	**3,95%**
Havanoid - Naples Dentate Stamped	1	**1,32%**
Havanoid -Naples Stamped (cord-wrapped stick)	1	**1,32%**
Havanoid -Sorg Banded Dentate	2	**2,63%**
Lake Benton	**18**	**23,68%**
Lake Benton Cordmarked	1	**1,32%**
Lake Benton Cord-wrapped Stick Impressed	1	**1,32%**
Lake Benton Horizontal Cordmarked	1	**1,32%**
Lake Benton Vertical Cordmarked	15	**19,74%**
Loomis	**18**	**23,68%**
Loomis	6	**7,89%**
Loomis Broad Incised	4	**5,26%**
Loomis Cord Impressed	5	**6,58%**
Loomis Cordmarked	3	**3,95%**
Onamia	**1**	**1,32%**
Onamia	1	**1,32%**
Spirit Jar	**4**	**5,26%**
Spirit Jar	4	**5,26%**
Unidentified	**21**	**27,63%**
Unidentified	21	**27,63%**
Grand Total	**76**	**100,00%**

Table 7: Rim affiliation statistics

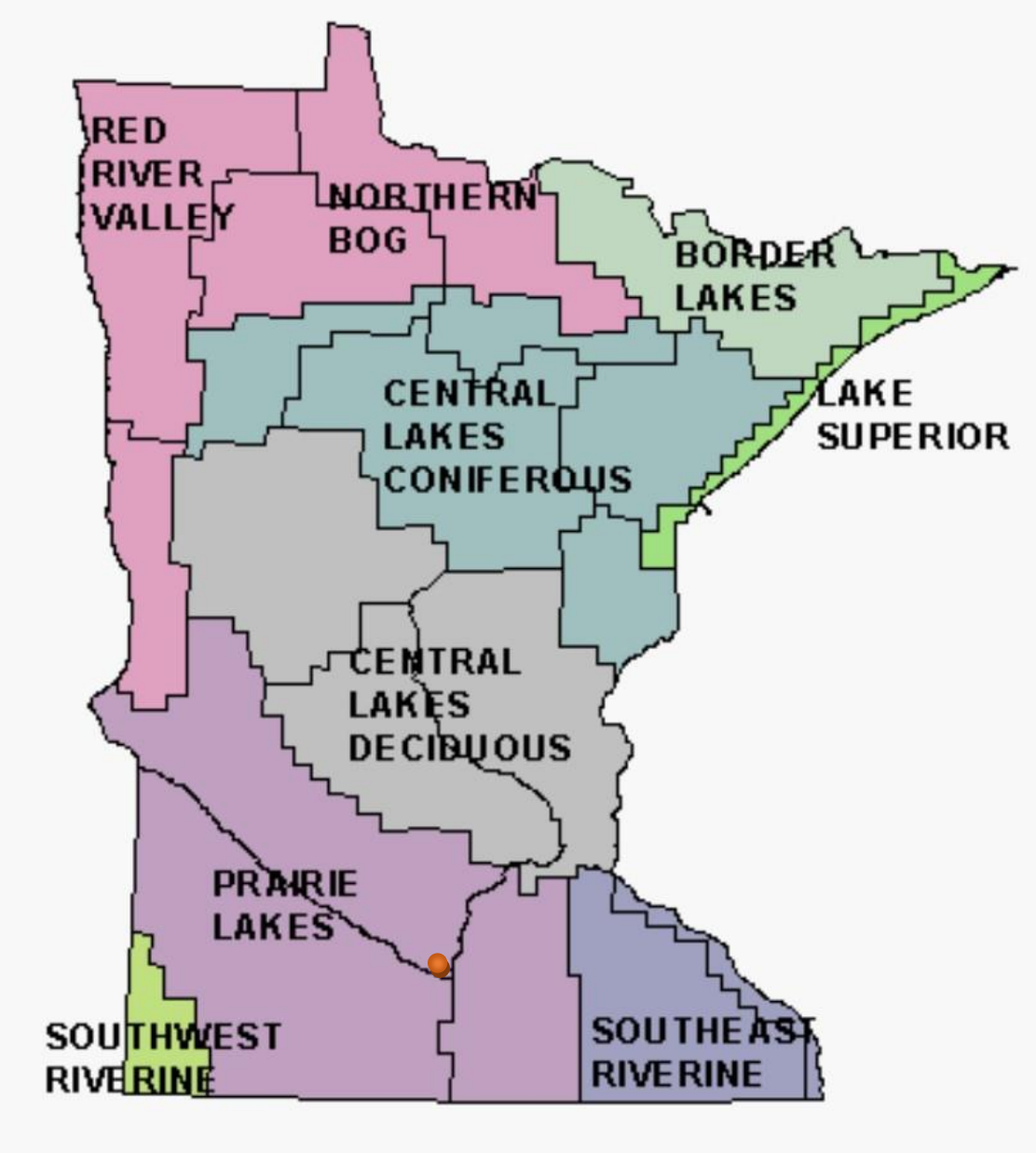
Affiliation	Cord Impressed	Cord-Wrapped Tool Impressed	Tool Impressed	Fiber Impressed	Finger Impressed	Punctated	Dentate Stamped	Comb Stamped	Toothed	Trailed Line	Incised	Intaglio Bossed	Total
Havanoid	1	1	1	0	0	9	4	1	0	7	3	0	**27**
Spirit Jar				1		1							**2**
Unidentified	8	6	6		2	1	1		1		1	1	**27**
Onamia		1											**1**
Loomis	7	2	11	0	3	2	0	0	2	7	4	1	**39**
Lake Benton	11	1	3	0	0	0	1	0	0	0	2	0	**18**
Fox Lake	2	0	0	0	0	3	0	0	0	1	0	2	**8**
Total	**29**	**11**	**21**	**1**	**5**	**16**	**6**	**1**	**3**	**15**	**10**	**4**	**122**

Table 8: Decoration types by affiliation

APPENDIX B: MAPS

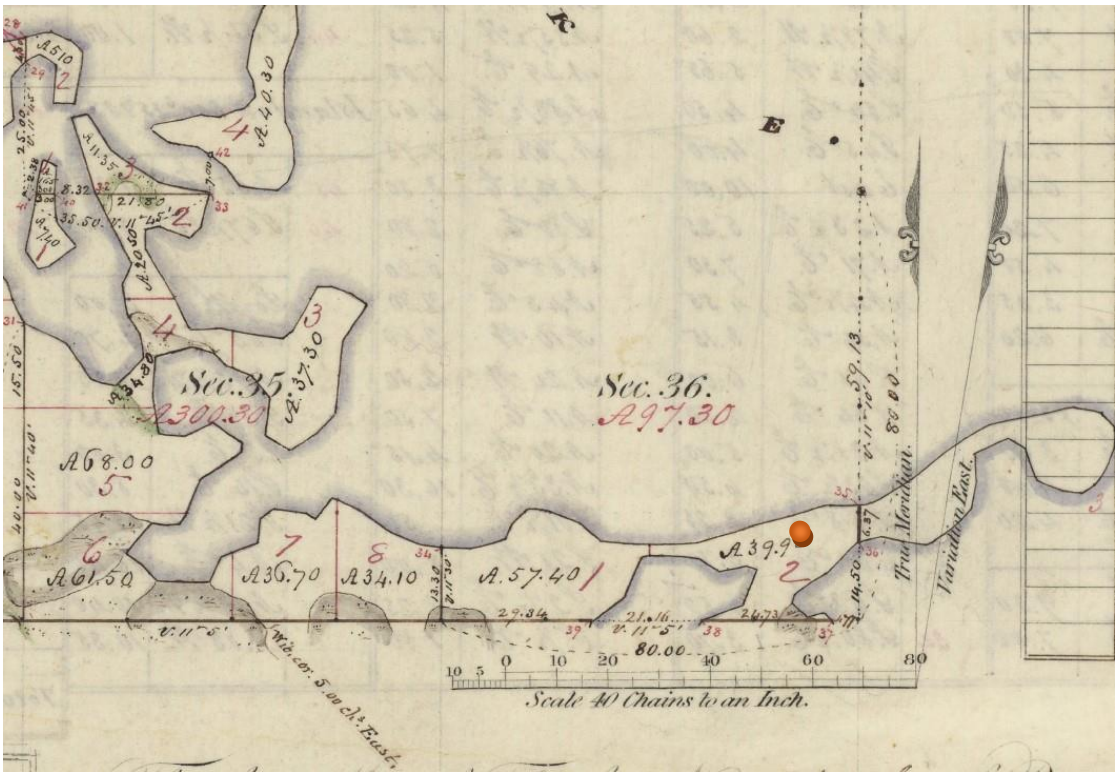


Map 1: Eleanor Site (21NL30) location (indicated by red circle) on Minnesota Department of Resources Ecological Provinces Map.



Map 2: Eleanor Site (21NL30) location (indicated by red circle) on Archeological Resource Regions and Subregions of Minnesota Map

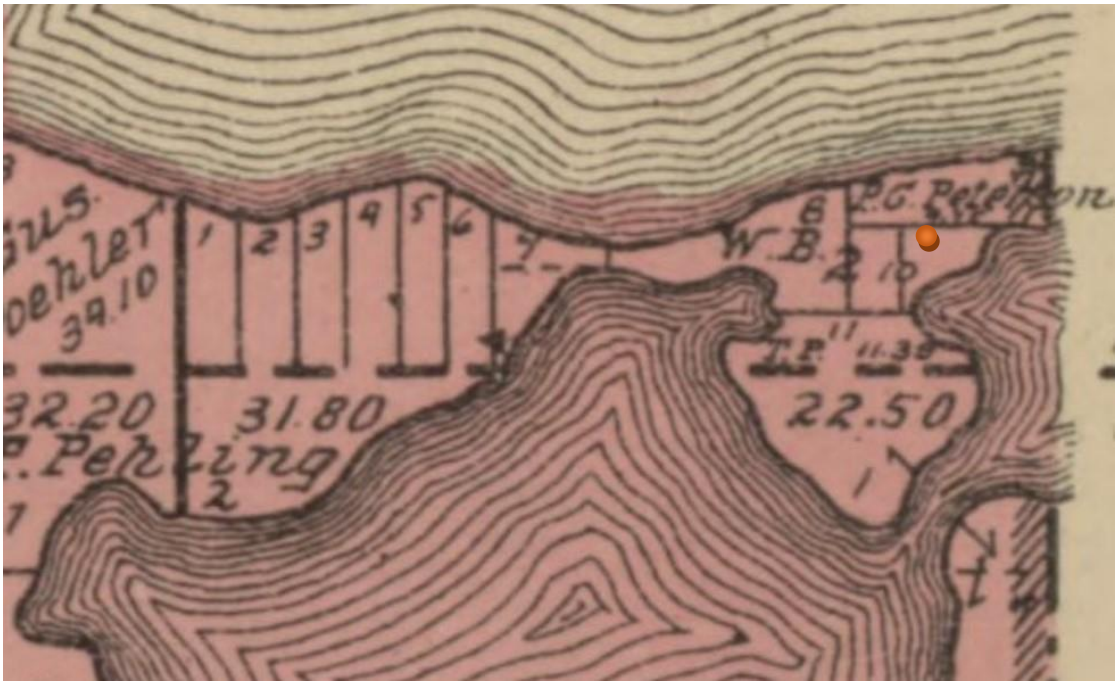
Map 3: Eleanor site (indicated by red circle) on Courtland Township Map.



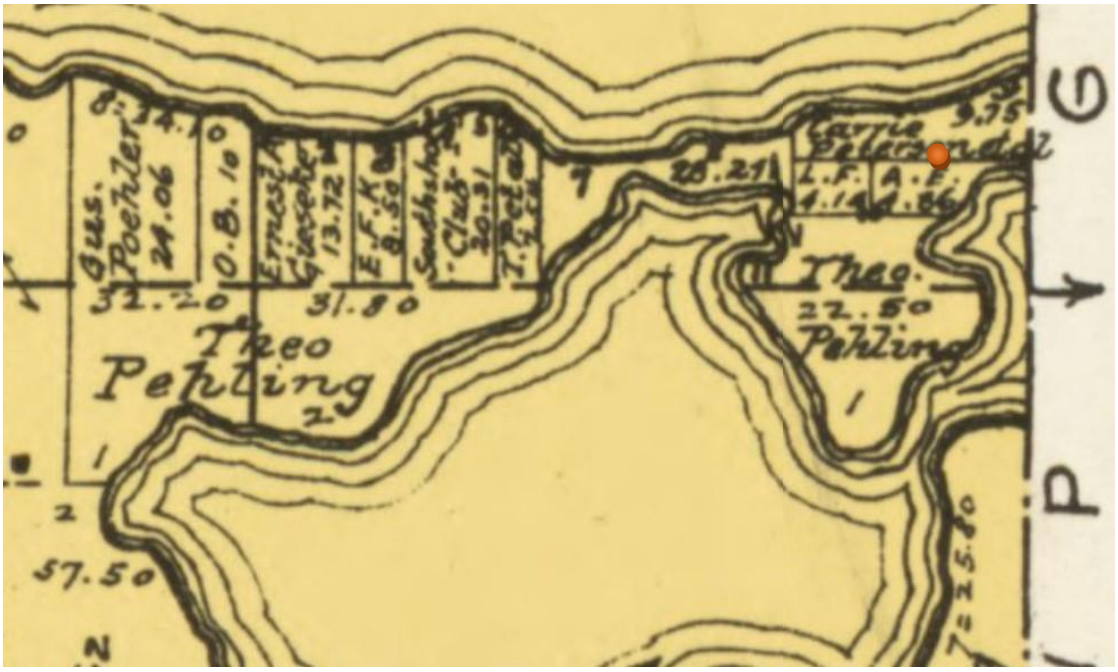
Map 4: Eleanor site location (indicated by red circle) on 1855 GLO Plot.

Map 5: Eleanor site location (indicated by red circle) on 1885 Nicollet County Township Map.

Map 6: Eleanor site location (indicated by red circle) on 1899 Nicollet County Plat Book.

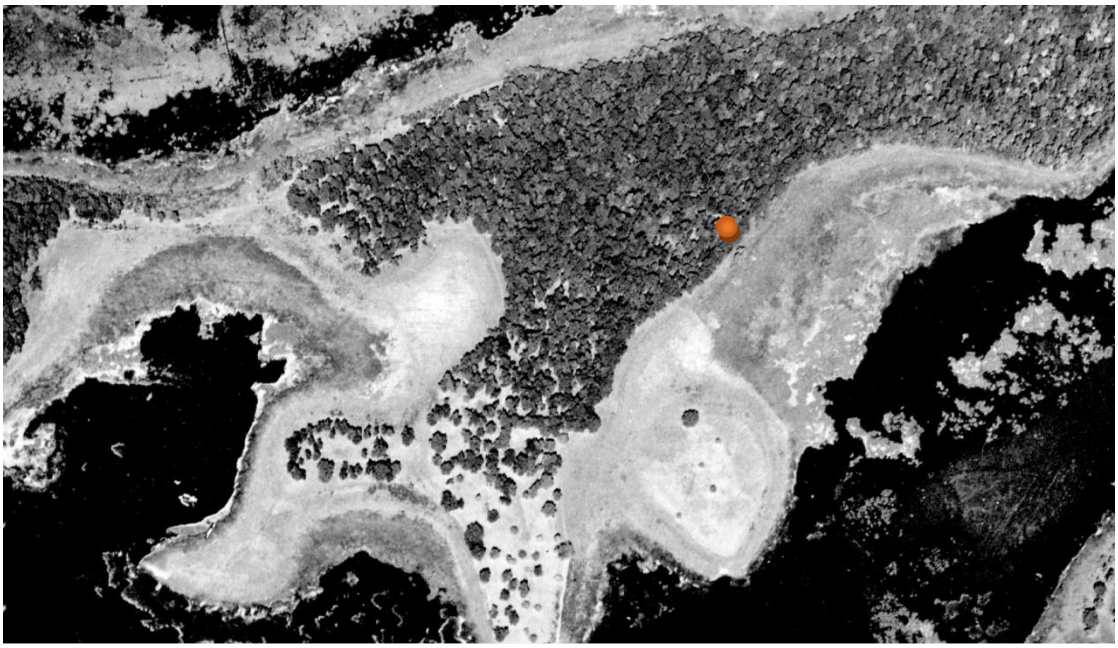


Map 7: Eleanor site location (indicated by red circle) on 1913 Atlas and Farm Directory of Nicollet County.



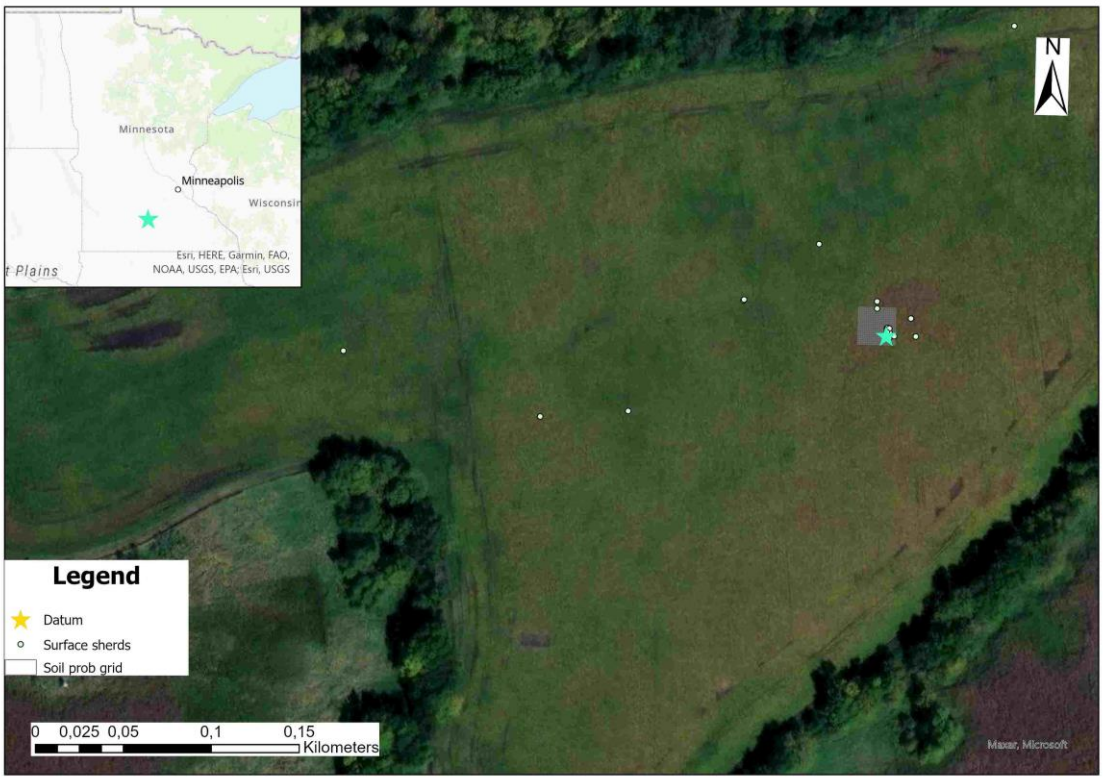
Map 8: Eleanor site location (indicated by red circel) on 1927 Atlas of Nicollet County.

Map 9: Eleanor site location (indicated by red circle) on 1938 aerial photograph.

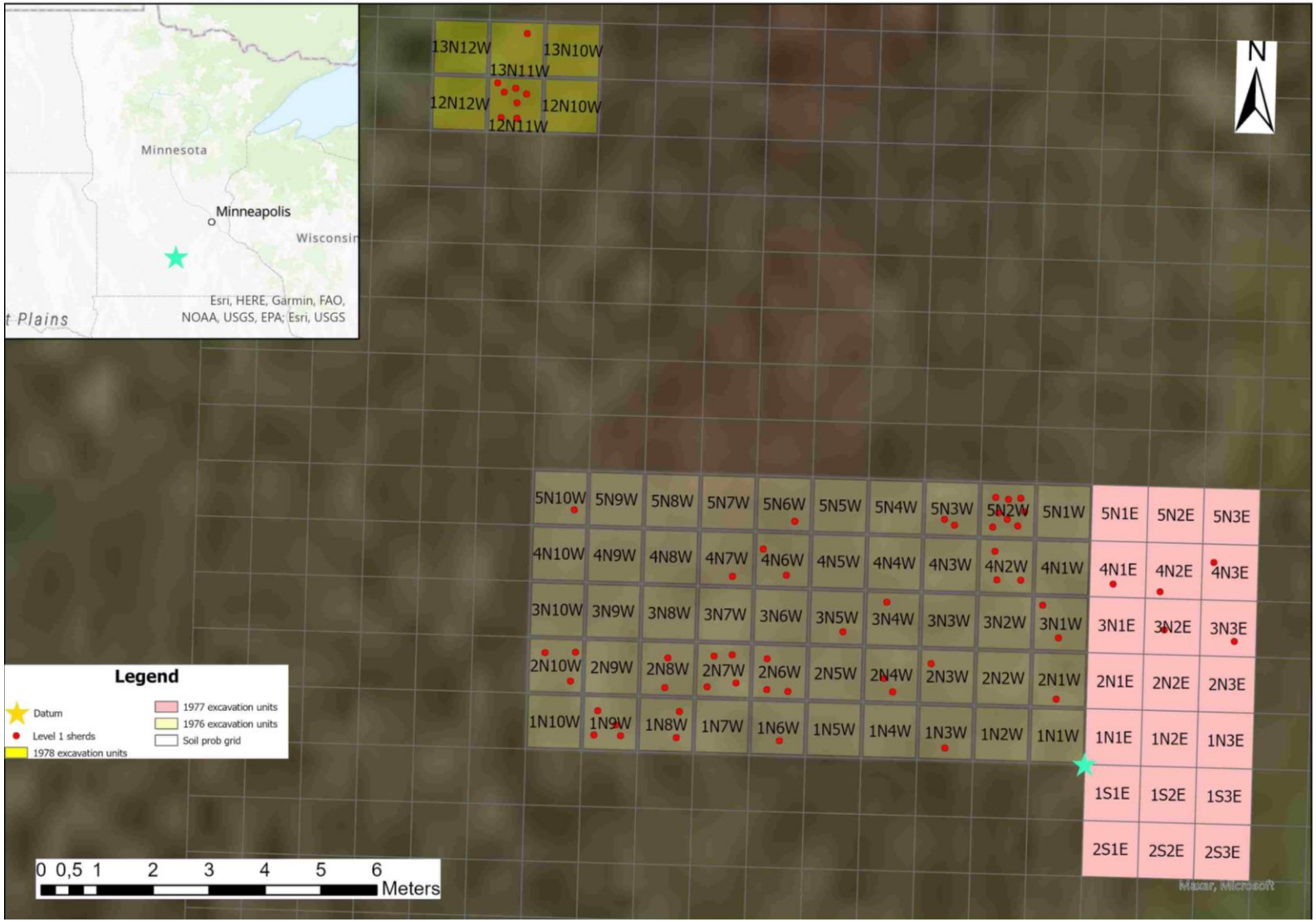


Map 10: Eleanor site location (indicated by red circle) on 1950 aerial photograph.

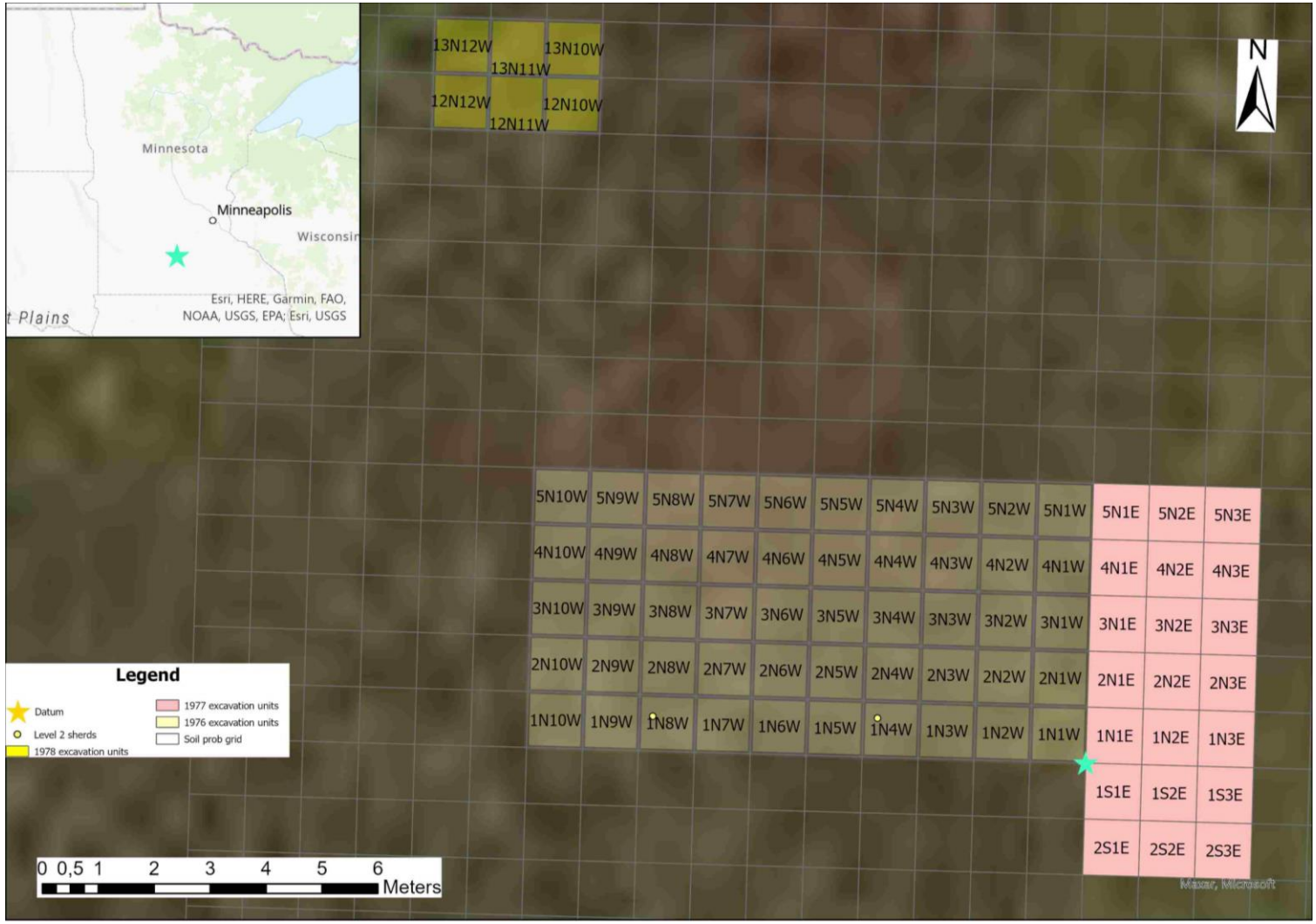
Map 11: Eleanor site location (indicated by arrow) on 1968 aerial photograph.



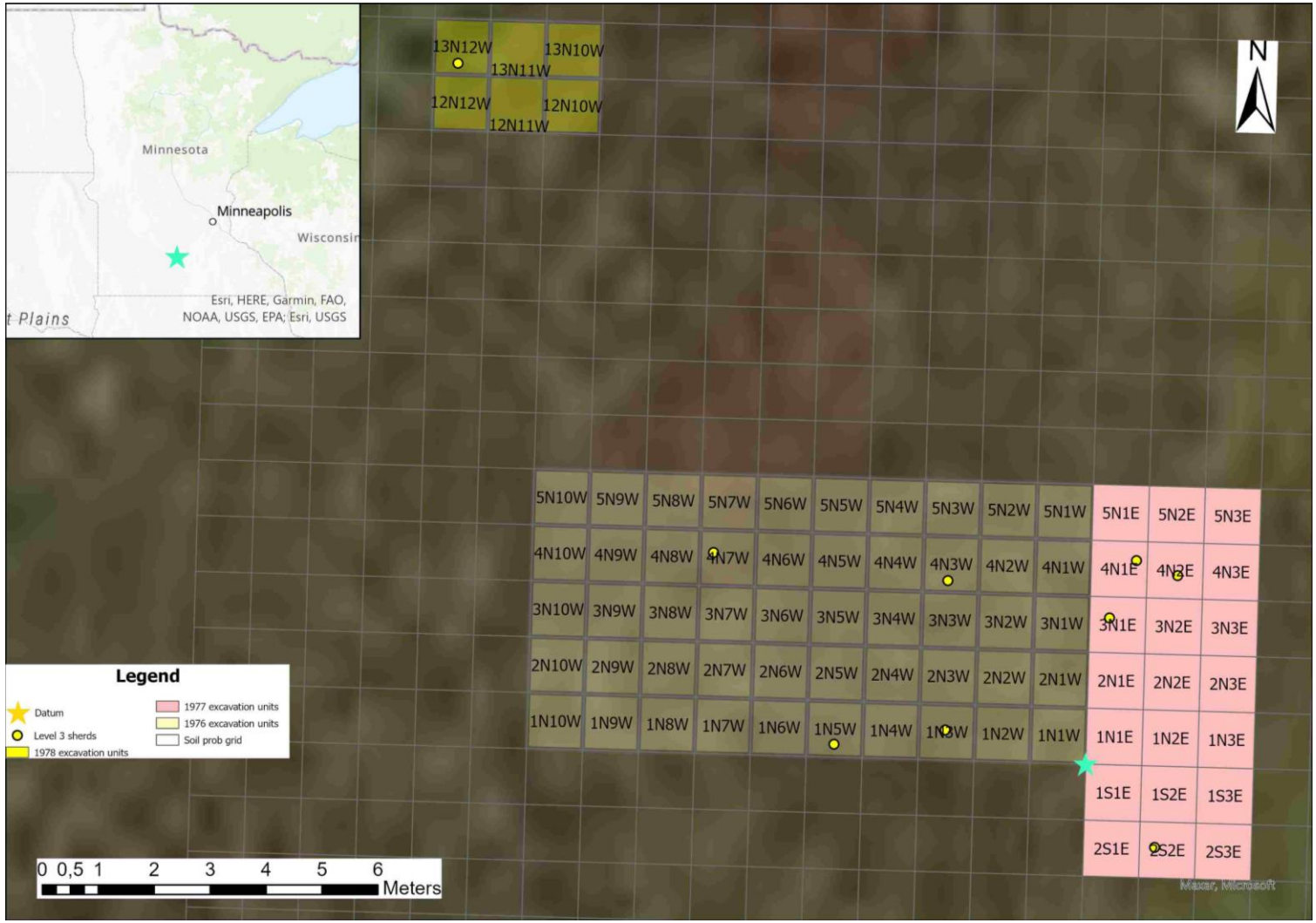
Map 12: Approximate location of examined sherds from surface collection



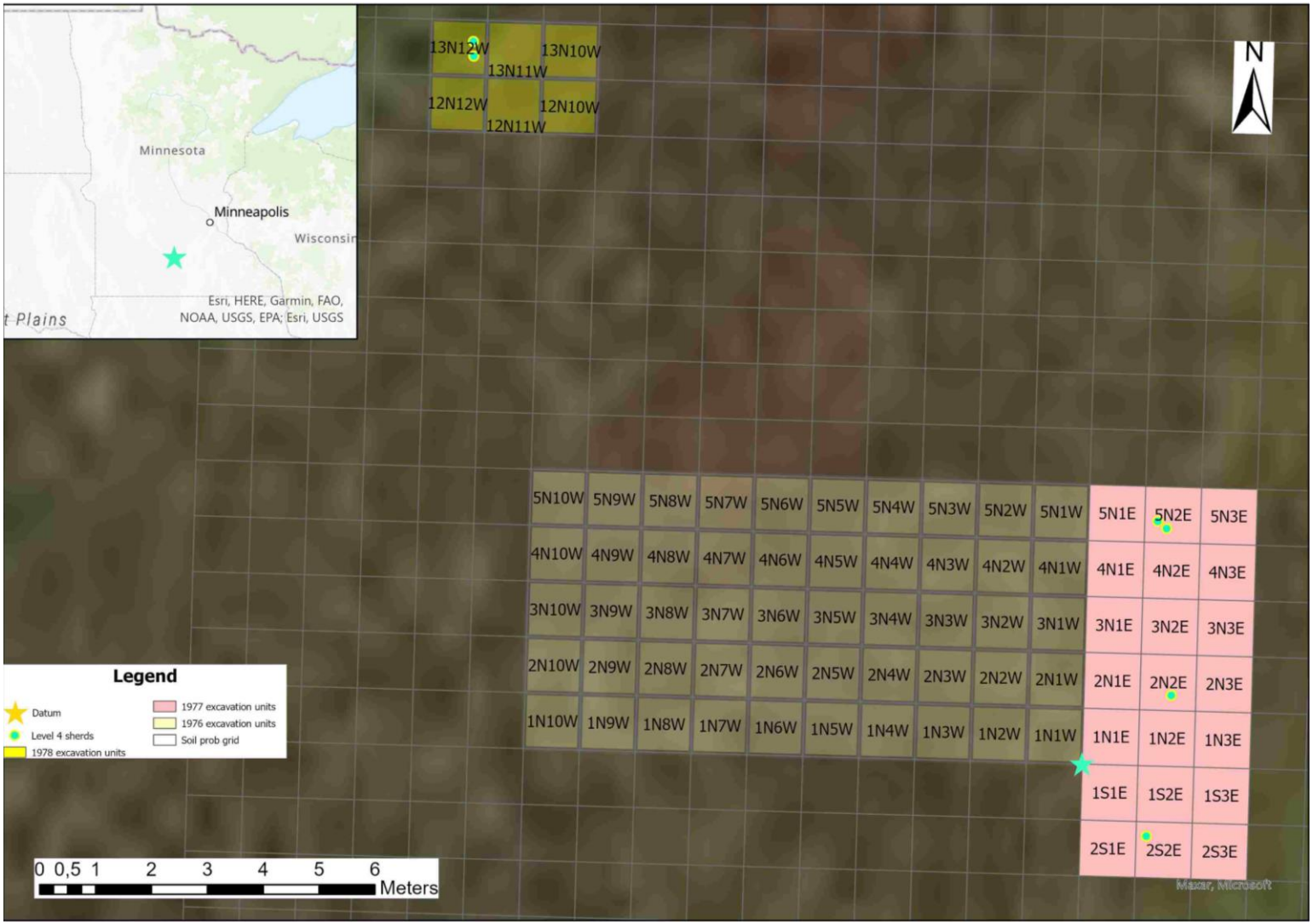
Map 13: Approximate location of examined sherds from excavation level 1 (0-20 cm)



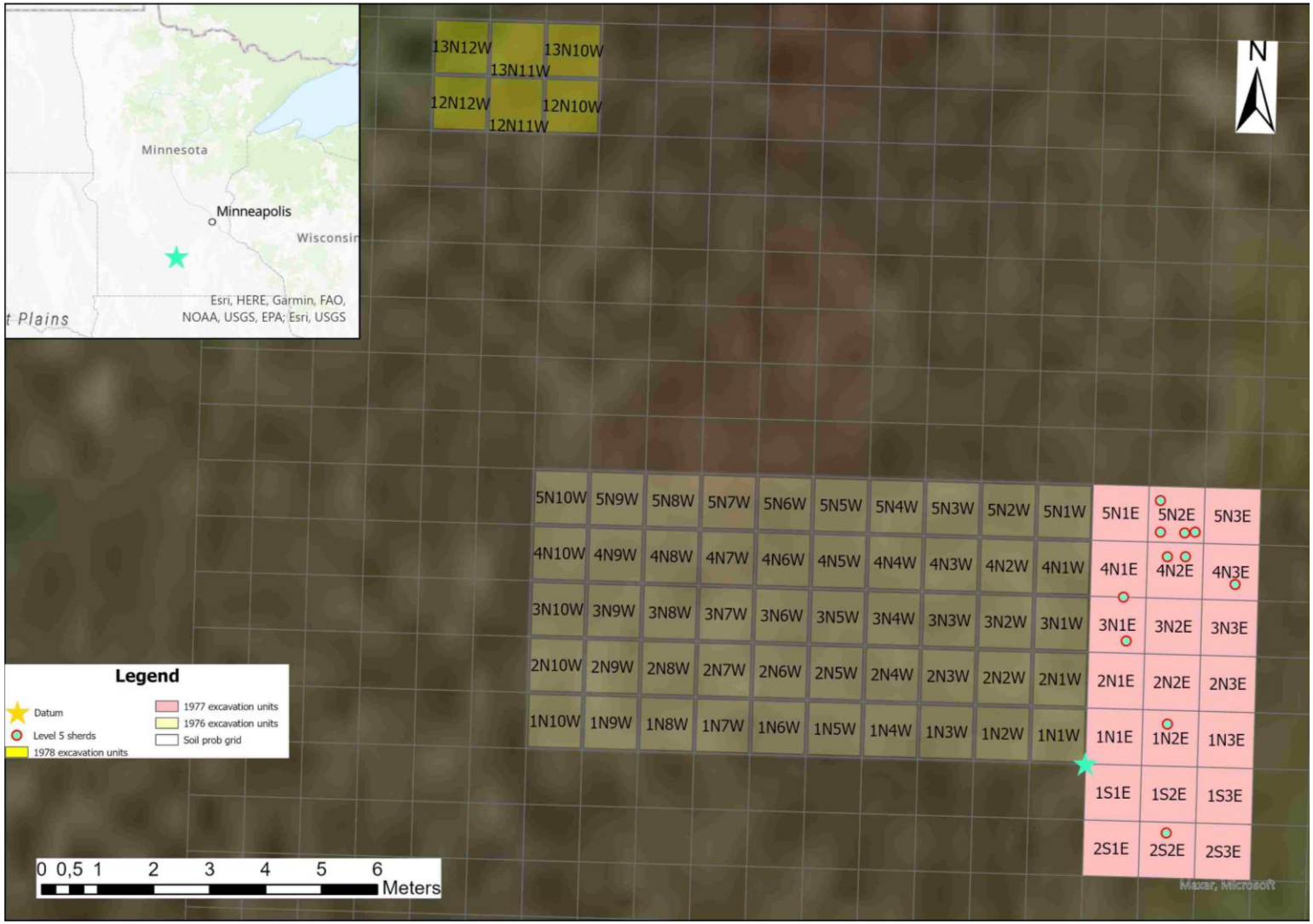
Map 14: Approximate location of examined sherds from excavation level 2 (20-23 cm)



Map 15: Approximate location of examined sherds from excavation level 3 (50-60 cm)



Map 16: Approximate location of examined sherds from excavation level 4 (60-70 cm)



Map 17: Approximate location of examined sherds from excavation level 5 (70-80 cm)

APPENDIX C: ARTIFACT IMAGES

Figure 1: Sherds form vessel identified as Havana Zoned

Figure 2: Havana Zoned rim (cat #1)

Figure 3: Naples Stamped pottery rim sherd (cat #29)

Figure 4: Naples Stamped pottery sherd (cat #53)

Figure 5: Naples Stamped pottery rim sherd (cat #71)

Figure 6: Sorg Banded Dentate rim sherd (cat #26)

Figure 7: Howard Lake pottery sherd (cat #24)

Figure 8: Howard Lake pottery sherd (cat #95)

Figure 9: Howard Lake pottery sherd (cat #36)

Figure 10: Havanpid pottery rim sherds (cat #32,33)

Figure 11: Vertical Cordmarked Fox Lake pottery rim sherd (cat #28)

Figure 12: Vertical Cordmarked Fox Lake pottery rim sherd (cat #27)

Figure 13: Vertical Cordmarked Fox Lake pottery rim sherd (cat #51)

Figure 14: Vertical Cordmarked Fox Lake pottery rim sherd (cat #58)

Figure 15: Vertical Cordmarked Fox Lake pottery rim sherd (cat #25)

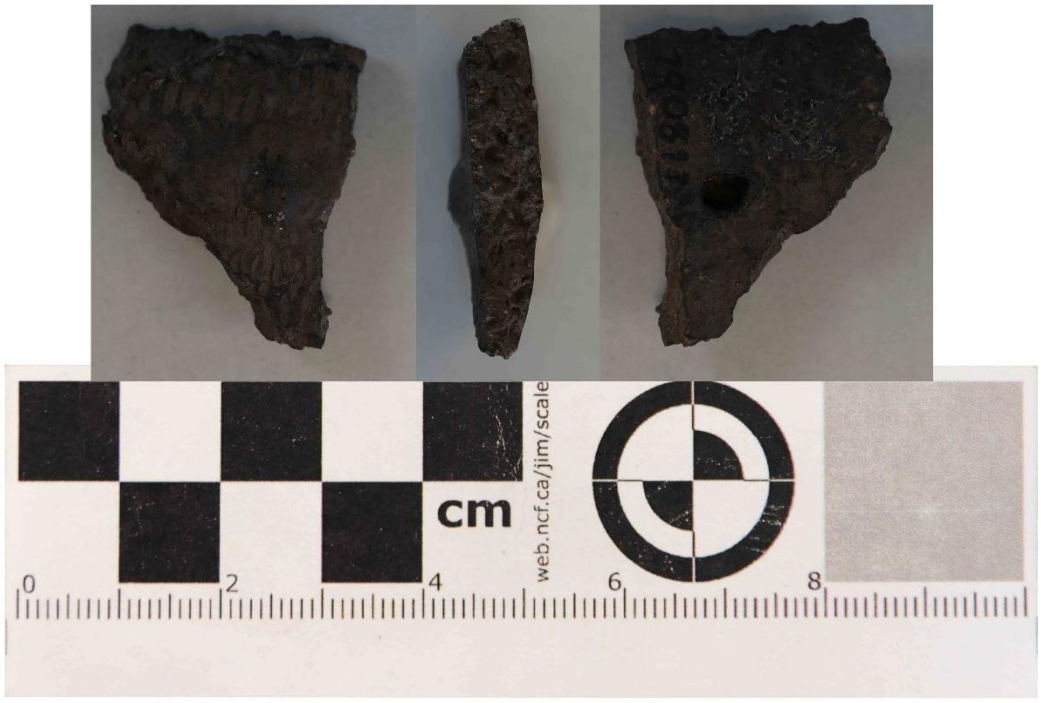


Figure 16: Fox Lake pottery sherd (cat #56)

Figure 17: Fox Lake pottery sherd (cat #73)

Figure 18: Fox Lake pottery sherd (cat #67)

Figure 19: Lake Benton Vertical Cordmarked pottery rim sherd (cat #21, 37, 70)

Figure 20: Lake Benton Vertical Cordmarked pottery rim sherd (cat #59, 103, 107)

Figure 21: Lake Benton Vertical Cordmarked pottery rim sherd (cat #57)

Figure 22: Lake Benton Cord-wrapped Stick Impressed pottery rim sherd (cat #31)

Figure 23: Loomis Cord Impressed pottery rim sherd (cat #48)

Figure 24: Loomis Cord Impressed pottery rim sherd (cat #40)

Figure 25: Loomis pottery rim sherd (cat #64)

Figure 26: Loomis Cordmarked pottery rim sherd (cat #34)

Figure 27: Loomis Cordmarked pottery rim sherd (cat #76)

Figure 28: Loomis Broad Incised pottery rim sherd (cat #16)

Figure 29: Onamia Cord-wrapped Stick Impressed pottery rim sherd (cat #38)

Figure 30: Cambria pottery sherd (cat #91)

Figure 31: Spirit Jar pottery rim sherd (cat #23)

Figure 32: Spirit Jar pottery rim sherd (cat #15)

Figure 33: Unidentified pottery rim sherd (cat #79)

Figure 34: Unidentified pottery rim sherd (cat #50)

Figure 35: Unidentified pottery rim sherd (cat #94)