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An Archaeological Model of Northern Warren County Prehistory with Survey Data

Whitney Alina Mark
University of Northern Iowa

AN ARCHAEOLOGICAL MODEL OF NORTHERN WARREN COUNTY PREHISTORY WITH SURVEY DATA

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Whitney Alina Mark

University of Northern Iowa

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Date Jessica Moon, Director, University Honors Program

Table of Contents

Evidence of prehistoric peoples have been found across Warren County and are ascribed to several time periods and groups. Warren County is located in southern Central Iowa, just south of the Des Moines River. Within northeastern Warren County there is a piece of property owned by Ronald and Linda Mark. This property is approximately 69 acres in size and was the location of an archaeological survey in the spring of 2010. The survey was undertaken in order to test a model created about the prehistory of the region. The model was created from the information available from Iowa's Office of the State Archaeologist site files. Through analyzing data from the site files, trends in habitation locations, artifacts, and environments were used in the creation of a model about the prehistoric archaeological sites of northern Warren County. This model can be used in identifying potential site locations throughout the region. It may also be used in providing insight into the cultural evidence and time periods that may be encountered. This model was used on the survey property for the identification of potential site areas. Next, survey work was undertaken to test if the model was accurate for the survey area. The model serves to describe where archaeological sites may be found throughout northern Warren County, and can therefore be used for purposes outside of this particular survey as well.

Statement of Purpose

The following paper is an outline of prehistoric cultures within Central Iowa and more specifically northern Warren County. The purpose of this study was the evaluation of the archaeological evidence near Middle River and the creation of a model to explain the location of this evidence. The model was created in order to predict what types of sites are common as well as what topographical locations they are located on. The number and location of known sites, as well as their cultural identification was analyzed

in order to determine the probability that cultural remains could be found on the survey property being studied. The predictability of the model was then tested through a survey of the property by means of shovel tests at set intervals throughout the survey property. This process serves two purposes: it tests the reliability of the model, and it also indicates whether or not prehistoric activity is evident within the property.

Model Methodology

Preliminary research of Central Iowa archaeology was undertaken to understand the likely types of cultures present within Warren County. This included not only the cultures, but the chronology of cultures as present in styles of lithics and ceramics. Having a thorough understanding of the cultures present in the archaeological record is useful in the creation of the model, as well as in understanding the artifacts identified in the site files.

The ecology of southern Central Iowa was analyzed to distinguish what made the region unique for prehistoric peoples and why they would or would not inhabit the area over other regions in the plains-prairie area of the Midwest. This included studying the topography of the region, including what caused the geomorphology of the land. The major water sources were also identified and located within Central Iowa and Warren County to understand trends in habitations.

After the preliminary research into the prehistory and physiography of Central Iowa was completed, the county GIS map of sites was reviewed to locate the site numbers for known sites in northern Warren County. The reference numbers for the site files near Middle River were then used to view and analyze the pertinent site files.

Information on known cultural identification and locations of sites was then utilized in the creation of the predictive archaeological model.

Predictive models are created in order to distinguish possible sites on various landscapes. Warren County is composed of over 260 archaeological sites (The Office of the State Archaeologist 2010). After investigating the site files of Warren County from the Office of the State Archaeologist of Iowa, many of these sites were found to be superfluous for this study because the places and artifacts relate to historic artifacts and not prehistoric. The remaining prehistoric sites and their files were then used to find the following information: distance to water, location, landscape, elevation, identified cultural group, flora and fauna remains, type of site, and size. The date in which the site was discovered or reported to the Office of the State Archaeologist at the University of Iowa was also taken into account for accuracy reasons. Some sites, such as 13WA7 or 13WA38, provided only information as to the artifacts found, and none of the cultural or topographical information. For a site with no more than lithic debitage, time periods and cultural groups are vague. However, most site files do give information on the location and landscape of the site areas. For 13WA20 for instance, the lithic scatter was found on a ridge in an area of 25 meters by 30 meters (OSA 2010).

For the creation of the model, information gathered from the site files of Warren County as well as from experts within the field was utilized to determine what and where artifacts could be found within the region. The model is a hypothesis that can be used when searching for potential sites. It can be utilized by anthropologists completing survey work within the area. The model can also be used as a framework with which to interpret sites. For the purpose of the survey work, the model was used in searching out the most

likely area on the test property for prehistoric peoples to inhabit based on elevation, distance to water, topography, and known archaeological sites near the survey area. The survey methodology will be discussed later.

Environmental Setting

The physiography of Iowa and northern Warren County is the product of glacial drifts. Central Iowa is split into two geomorphologic regions: the Des Moines Lobe and the Southern Iowa Drift Plain, of which Warren County is a part. The geomorphology north of Warren County consists of the base of the Des Moines Lobe that juts through Iowa from the north and ends at the convergence of the Des Moines River and Raccoon River. South of these two rivers is the Southern Iowa Drift Plain that takes up the largest section of Iowa (Prior 1976). The Southern Iowa Drift Plain is described, by Jean Prior in *A Regional Guide to Iowa Landforms*, as the most "typical" Iowa landscape in that it has rolling hills with "areas of uniformly level upland divides and level alluvial lowlands" with the majority of land located on hill slopes (Prior 1976:45). These rolling hills are dissected with drainage streams.

The rivers of Warren County include the Des Moines River, South River, North River and Middle River. The Des Moines River cuts through the very northeastern corner of the county and continues southeast as one of the tributaries to the Mississippi River. The main rivers that run through the county are North River, Middle River, and South River. These rivers eventually converge with the Des Moines River as well. It is at these rivers, intermittent streams, and their drainage tributaries that the majority of sites occur in the county.

The flora of Warren County is a mix of native prairie and woodlands. Prior emphasizes that the natural flora across Iowa has changed drastically as it has been occupied and changed by humans. The prairie and grasslands that largely covered Iowa have been greatly depleted and the land conducive for prairie has been cultivated for agricultural crops. Much like forests of today, however, in prehistoric Iowa deciduous forests were prevalent surrounding streams, hillsides and ridgetops (Prior 1976).

Warren County Prehistory

Warren County has evidence of human habitation that dates back over 11,000 years as Pleistocene hunters moved in to Iowa. Evidence of Paleoindian, Archaic, Woodland and Mississippian cultures has been identified in various sites across Warren County. There is also prehistoric archaeological evidence that cannot be identified as belonging to any particular time period or cultural affiliation.

Before the information on Warren County prehistory is presented, it is important to recognize that although the prehistoric occupations of Iowa have been categorized into certain time periods, some sites show occupation by several cultural groups over time, such as materials from Woodland and Oneota groups at the same site, as well as reoccupation or seasonal occupation by the same cultural group (DeVore 1984). With that in mind, the following is an overview of the Paleoindian, Archaic, Woodland, and Oneota evidence in Warren County.

Paleoindian

One of the most substantial collections of Paleoindian artifacts in Iowa comes from northern Warren County, near the Middle River. These remains come in the form of

Clovis projectile points from the Carlisle Clovis Cache. Archaeologists recovered 38 unfinished stone tools that have been dated to approximately 11,000 years ago (OSA 2010). Clovis tools were created by late Pleistocene hunters as they moved into Iowa as the glaciers retreated. The amount of Paleoindian artifacts found at the Carlisle Clovis Cache site is considered very rare (Alex 2000).

Archaic

The Archaic peoples lived in a time period that spanned from 8500 B.C. to 800 B.C. The Early Archaic time period began near the end of the Pleistocene age, around 8500 B.C. and continued into the Holocene epoch until 5500 B.C. There has been no archaeological evidence of Early Archaic peoples in Warren County. Reasons behind a lack of Archaic evidence are unknown, but some have attributed this to Archaic sites' depth within the soil, bias by archaeologists, or other unknown cultural issues (Alex 2000).

The Middle Archaic period began at 5500 B.C. and continued until 3000 B.C. (Alex 2000). Evidence of Middle Archaic artifacts have been found in Warren County at site 13WA212. This site included artifacts such as fire-cracked rock and lithic waste. It was identified as Middle Archaic because of the type of soil the artifacts were found in and the depth at which they were found (OSA 2010). The Late Archaic period began at 3000 B.C. and continued until 800 B.C. Site 13WA57 has been identified as a mix of a Late Archaic and Woodland site. Artifacts from this site include a turkey tail blade, a celt, fire-cracked rock, and waste flakes (OSA 2010). Though there are several known Archaic

sites in Warren County, there are considerably few compared to the Woodland and Oneota sites in Warren County.

Woodland

Following the Archaic period is the Woodland period, 800 B.C. to 1200 A.D. The Woodland period has two unique features used in identifying sites: the use of pottery and the creation of burial mounds. Ceramic styles and stone tool artifacts provide evidence for identifying phases or time periods of Woodland sites. The Early Woodland period dates from 800 B.C. to 200 B.C. Projectile points of the Early Woodland tradition include Robbins, Adena, and Kramer (Alex 2000). Within Central Iowa and the Des Moines River valley, Early Woodland sites are most common on "fans, benches and uplands but are generally absent from river terraces and side valleys" (Alex 2000:95). An Early-Middle Woodland site is located in Warren County at site 13WA147. This site is identified as being Early-Middle Woodland because of the projectile point typology of Robbins and Waubesa. Dating of this site places it within the time period 1000 B.C. to 500 A.D. (OSA 2010). 13WA173 is another Early-Middle Woodland site that was believed to be a short-term settlement dating from 100-1000 A.D. (OSA 2010).

The Middle Woodland period spanned from 200 B.C. to 400 A.D. This period is noted for its many conical mounds that were created by piling soil into a mound shape (Alex 2000). Many mounds have been located within Warren County, though quite a few have not been attributed to a specific period within the Woodland. A Middle Woodland site in Warren County is 13WA173. This site was identified because of its grit-tempered pottery and a variety of flakes and biface lithics (OSA 2010). In the Des Moines River

valley and at Lake Red Rock, archaeologists believe that a lack of evidence for Early and Middle Woodland cultures may stem from construction and flooding caused by the creation of the Red Rock Reservoir (Benn and Green 2000).

Mounds were a process of burial utilized throughout Middle and sparingly through Late Woodland societies (Alex 2000). Historical excavations of mounds have found the bodies to be specially positioned, on clay floors, and with artifacts placed in the mound. These burial practices may be reflective of religious practices, as seen in proto-historic and historic groups, as well as stratified classes (Alex 2000). There are several areas with known mounds in Warren County. In a map of Iowa, the known mounds of Warren County fall along large rivers, such as Middle River, South River and the Des Moines River (Benn and Green 2000) At Woodland Mounds State Preserve, five conical mounds have been identified (13WA31). These conical mounds are located above 900 feet elevation with mound 1 located "at the highest part of the ridge in this area, in a small clearing" (Finney 1993:12). Other mounds exist within Wesley Woods at 13WA141, 13WA142, and 13WA143 in the hills above South River. At site 13WA126, the mound was found to be in an unusual spot. It is located on an upland sideslope 46 meters from a drainage tributary (OSA 2010). This mound is contrary to typical locations along rivers and on flat uplands.

Warren County has a wide variety of Late Woodland sites and artifacts. This period dates from 400 to 1200 A.D. Like the Middle Woodland peoples, the practice of burying their dead in mounds on ridgetops along rivers was continued sparingly in the Late Woodland (Alex 2000). Late Woodland sites in Warren County include: 13WA53, 13WA54, 13WA55, identified by the sand-tempered pottery and projectile points found

at the sites. 13WA102 is inundated with water from flooding in the creation of the Red Rock Reservoir. However, it was identified as a Late Woodland site prior to the flooding. 13WA213 is located along North River and was identified because of its cord-impressed rim sherds. 13WA236, 13WA237, and 13WA238 were identified as Late Woodland sites with the latter being a possible base camp or small village (OSA 2010).

The Late Woodland phases of Iowa include the Great Oasis Variant, Sterns Creek Phase, Saylor Phase, Minotts Phase, Louisa Phase, Keyes Phase, Hartley Phase, Floyd Phase, Henry Phase, and the post-Woodland Moingona Phase, to which the Oneota of Warren County belong. These cultural phases are recognized in archaeology through the different styles of pottery (Benn and Green 2000; Alex 2000). At 13WA241, the site was identified as Late Woodland because of its Minotts style pottery and a Creston or Pelican Lake projectile point. Site 13WA31, a mound site, was also identified as Late Woodland because of its ceramics typology (OSA 2010).

Oneota

At the end of the Late Woodland phase other cultural groups appeared. These late Prehistoric cultural groups included the Great Oasis, Mill Creek, and Glenwood cultures. These groups are distinct from their Woodland predecessors in the cultivation of corn into their diet by 900 A.D. (Alex 2000). Late Late Woodland camps have stylistic similarities with these larger cultural affiliations as marked by their habitation organization and cultivation of crops (Alex 2000). These cultural groups developed and interacted with their Late Woodland counterparts. After these groups had developed, a Mississippian tradition began in Iowa. The Oneota tradition developed within a larger

Mississippian tradition, the most famous of which is the Cahokia Mississippian tradition. Archaeologists have determined that the Oneota cultural pattern developed after the Woodland period and that its distinct artifacts are found in sites across ten states of the Midwest (Alex 2000). It is believed it is the prehistoric Oneota from which proto-historic and historic Native Americans such as the "Iowa, Oto, Missouria, and Winnebago" developed (Alex 2000:185). The Oneota of Iowa are split into several subgroups, including the Moingona phase, to which the Warren County Oneota belong. The Oneota sites of southern Central Iowa have been named the Moingona phase because it varies from Oneota manifestations throughout the Midwest and has therefore been designated as a separate phase from others in Iowa (Gradwohl 1967; Alex 2000; Straffin 1971).

Known Oneota sites in Central Iowa include Mohler Farm site, Wildcat Creek site, Dawson site, and Norman Dille site (Alex 2000). Oneota sites are located within several miles of the larger Cribb's Crib site (13WA105) and other large Oneota village sites. A model for Oneota family groups suggests that Oneota people had shifted in both patrilineal and patrilocal societies to matrilocal family groups and back to patrilocal over time. This shift is visible in the archaeological record through sizes and shapes of homes (Benn 1995; Hollinger 1995).

The Des Moines River valley and Middle River offer several Oneota sites and a variety of artifacts. There are significant Oneota sites located in Warren County that vary in size from only a few artifacts to large permanent settlements. Cribb's Crib site (13WA105), Lohmann site (13WA5), Paddy site (13WA108) and Clarkson site (13WA2) are all large village sites located in northern Warren County (Alex 2000; OSA 2010). Cribb's Crib site is a very significant find in northern Warren County because

archaeologists have unearthed 160 storage pits and fire features (Alex 2000; DeVore 1984). Cribb's Crib is located along the Middle River, south of Carlisle and before the Middle River joins the Des Moines River (OSA 2010; DeVore 1984). Cribb's Crib and the Clarkson Site can be further categorized as Moingona phase sites. Moingona phase sites are described as "village sites recorded south of the confluence of the Des Moines and Raccoon rivers" and as "the earliest in Iowa. Calibrated radiocarbon dates place them in the latter half of the thirteenth century A.D." (Alex 2000:198). Further study of Oneota sites have found that Moingona phase sites have been found sporadically north of the previously noted boundary, suggesting trade and associations among the habitations (Alex 2000). The large Oneota sites located near Carlisle have provided artifacts available for determining a date of habitation. The Clarkson site has been dated from 1185 ±55 to 1300 ±55 and the Cribb's Crib site has been dated to 1220 ± 60 (Boszhardt, Holtz, and Nienow 1995).

The Oneota sites near Carlisle, in northern Warren County, were studied and excavated by David Gradwohl and Iowa State University (DeVore 1984; Straffin 1971). This archaeology was necessary because of the imminent danger posed to the area due to the creation of the Red Rock Reservoir and the creation of a levee around Carlisle (DeVore 1984). The pottery discovered at the Oneota sites by Gradwohl and Iowa State University have been described as having distinct differences from the designs of other Oneota ceramics. However archaeologist Dean Straffin argues that although it has visible differences they do have similarities to Oneota ceramics from other locations (Straffin 1971). For these reasons, the ceramics have been categorized as Moingona instead of the many other Oneota phases across Iowa and the prairie-plains regions of the Midwest.

Common flora and fauna food remnants found within the Oneota sites in Warren County include the following: corn, beans, squash, fruit seeds, pig weed seeds, field peppergrass seeds, bison, deer, wapiti, fish, mussels, clams, turtles, birds, turkeys, plains pocket gopher, and snakes (DeVore 1984; OSA 2010). It is possible that plains pocket gophers may burrow into sites at later times (Straffin 1971). Charcoal remains have identified many trees used at these sites: willow, cottonwood, basswood, elm, red oak, American elm, white ash, red elm, hackberry, black walnut, black ash, hickory, and soft maple (DeVore 1984). The variety of fauna and flora remains suggest a diversity of diet and the cultivation of crops.

Unlike the Woodland burial practices, Moingona Oneota did not create mounds, but rather used burial pits, with an example of a charnel house containing sixteen bodies, as well as signs of violent death in several Monigona burials (Alex 2000). At Cribb's Crib, six human teeth and part of a mandible with a seventh tooth were discovered. Five of the teeth were discovered in filled features, while the "molar and mandible fragment were from adjacent excavation squares" (DeVore 1984:186). Although a mound was discovered at 13WA41 and described as Oneota by the early twentieth century gravediggers (OSA 2010) no collection exists to prove or disprove this claim. However, a model for the Walker-Hooper site of Wisconsin also discusses possible Oneota burial mounds (Overstreet 1995).

Model and Rationales

The following is a predictive model for locating prehistoric sites within northern Warren County. It was created using information from known sites in order to develop

the most likely location of undiscovered sites based on site location criteria, as well as the expected cultural affiliations to be found during survey work. Although the trends depicted below are strictly based on environmental aspects, this is only because of the information available from the prehistoric artifacts and site locations. By analyzing the trends of habitation, a model for where prehistoric peoples likely lived has been developed. However, the artifacts and site remains can give only nominal insight into the motivations, either rational or irrational, behind why prehistoric people have left evidence where they have. Due to this, exceptions to the model may occur. The following model is made from the trends that occur in site locations based on topography and slope, distance to water, and distance to permanent settlements.

Topography and Slope

The site locations within Warren County are correlated with the topography of the land. The topography varies from flat lowlands to flat uplands with sloped hills and drainage streams in between (Prior 1976). For lithic scatters, the topography of the land seems to have no influence on where these sites are found. Lithic scatters have been found within sites, but also as single entities of a site. The locations of these scatters are variable and not always attributed to a cultural group because of the lack of cultural markers with lithic waste. Possible reasons for isolated lithic finds include the following: it may be that the stone lithics are the only surviving artifact at the site location; that the lithics have been moved through cultivation or water; or that the site may have been destroyed through land cultivation or soil disruption. For debitage scatters, the most common location would be within camps or settlements. However, the topography of the land seems to have no effect on where these artifacts are discovered. Various topographic

locations and the sites associated with them include: on the floodplain below a terrace (13WA26), on a terrace/bench (13WA187), a backslope/sideslope (13WA216), a ridge of a hill (13WA7), on shoulder/uplands (13WA220), and on a bench (13WA224) (OSA 2010).

Archaic sites in Warren County include 13WA212 and 13WA57. No topographical information is listed for 13WA57, but 13WA212 is located on a terrace/bench (OSA 2010).

For Woodland camps or settlement sites, locations vary between highlands and lowlands. For 13WA13 the camp artifacts were found on a backslope or ridge spur (OSA 2010). An Early-Middle Woodland site at 13WA147 is located on a floodplain. A second Early-Middle Woodland site (13WA173) is located on a terrace/bench. At 13WA238, a Late Woodland village, artifacts were found at the summit and shoulders of the uplands overlooking Middle River. At site 13WA12, Woodland artifacts were found at the summit of a steep hill (OSA 2010). Woodland sites have also been found on the lowlands. Cord-impressed ceramic rim sherds were found on a terrace/bench 100 meters from North River (13WA213). Flood plains as well as terraces and benches are also common places for Late Woodland sites (13WA102). At 13WA130 a Woodland site of ceramics and flakes was discovered 800 meters from water on a floodplain (OSA 2010).

Most mounds are attributed to Woodland groups. These are typically found on ridges or summits in the uplands. Mounds in Warren County appear in groups of one to five. The five conical mounds at Woodland Mounds State Preserve (13WA31) are located 200 meters from water and at the top of a summit, near 900 feet elevation (Finney

1993; OSA 2010). The three mounds located in Wesley Woods (13WA141, 13WA142, 13WA143), overlooking South River were 150, 300 and 500 meters from water respectively and all located along blufftops in pasture or forested areas above the river (OSA 2010). From the locations of known mounds in Warren County, an assumption can be made that Woodland peoples in Warren County preferred to bury their dead in areas of high elevation or uplands, above major waterways. There is an exception to this trend however. A Woodland attributed mound (13WA126) found below Woodland sites 13WA92, 13WA93, and 13WA94 was found only 46 meters from water at the edge of a drop-off to a tributary drainage stream. The mound was found on an upland sideslope instead of a summit or blufftop (OSA 2010).

Oneota sites are located within the northeastern corner of Warren County, along the Des Moines River and its tributaries. The Clarkson site (13WA2) is located on a terrace/bench on the right bank of the Des Moines River (OSA 2010). 13WA4 is located on a blufftop (OSA 2010). 13WA11 had clam faunal remains in the site, suggesting nearness to water. 13WA5 is located on a terrace/bench and described as "Low, on the Middle River floodplain" (OSA 2010). Cribb's Crib (13WA105) is located on a terrace "18.22 feet above the left bank of the Middle River" at an elevation between 774 and 782 feet (DeVore 1984:21).

Distance to Water

Of reported distances to significant water-ways, sites vary from 30 to 800 meters from a source. Water sources include intermittent or seasonal streams, rivers, large drainage streams or tributaries, and in specific examples, sites under the Red Rock

Reservoir. Rivers and streams used in the measured distances to water include the following: Des Moines River, North River, Middle River, South River, Clanton Creek, Badger Creek, White Breast Creek, Coal Creek, and a variety of unnamed drainage streams and tributaries (OSA 2010).

There is little evidence of Archaic, Early and Middle Woodland sites, however, the sites that have been located are within a quarter of a mile of water. Archaic site 13WA212 is located 50 meters from North River and east of a shallow drainage stream (OSA 2010). An Early-Middle Woodland site 13WA147 is located 125 meters from a perennial stream/river. 13WA173 is located 400 meters from water.

Late Woodland sites appear varied in their distance to a water source. Several sites (13WA101 and 13WA102) are located under the Red Rock Reservoir but this occurred in historic time periods and these sites were able to be excavated before they were covered (OSA 2010). These sites are now inundated with water and therefore cannot be further excavated. The furthest recorded distance for any site in Warren County is 800 meters from water (13WA238, 13WA130, and 13WA236), regardless of cultural affiliation. Other distances for Woodland sites are varied from 30 meters (13WA247) to 250 meters (13Wa241) to 450 meters (13WA132), and so on (OSA 2010). For the model, the most likely places for settlements in relation to water would be between 800 meters and the ridge or terrace above water. However, although the furthest distance has been calculated, the majority of Woodland sites in Warren County lie near the four main rivers of the county (Alex 2000).

The largest Oneota settlement or village sites naturally appear in areas close to water. Cribb's Crib site (13WA105), Lohmann site (13WA5), Paddy Site (13WA108) and Clarkson site (13WA2) are all very large Oneota sites located near the Des Moines River. These sites appear to be related to a trend of Oneota sites along the Des Moines River through Polk, Marion and Warren Counties. These sites are spread across a territory of 150 kilometers and may represent seasonal settlement sites (Alex 2000). The Cribb's Crib site is located near three rivers. "The Middle River is located 1/4 mile southeast of the site. The Des Moines River flows approximately two miles east of the site while the North River flows approximately 2/3 mile north of the site" (DeVore 1984:21). These sites typically occur on "high, prairie covered terraces" (Alex 2000:198).

Distance to Permanent Settlements

A trend of habitation is clear in the settlement of Oneota sites. Oneota sites have only been identified in northern Warren County near Carlisle, Hartford, and Rising Sun. These are the location of three large Oneota settlements in Warren County as well as several smaller sites. Smaller Oneota sites are scattered within several miles of the settlement areas which could be part of a trend of Oneota sites throughout Central Iowa. The Oneota of Central Iowa are found near the Des Moines River in counties such as Polk County and Marion County. There may be a connection between the Oneota of these areas to non-Moingona Oneota groups from Eastern Iowa. Oneota sites throughout the Des Moines River valley and Red Rock area have evidence of trade with Oneota villages downstream through the evidence of Croton and Burlington chert stones, located from 40 kilometers to 140 kilometers away, as well as the connection of Moingona style pottery to Burlington phase ceramics (Alex 2000).

Late Woodland sites have also been found near other Late Woodland sites. 13WA236 is a possible small village or base camp located along a summit in the uplands overlooking Middle River valley. The open habitation is located 650 meters from Middle River and is near other recorded Woodland sites. 13WA237 and 13WA238 are also located above the valley of Middle River and on ridgetops or summits (OSA 2010). These sites may be connected and represent a seasonal settlement or a small permanent village.

Evidence of hearths and pits are located within larger Woodland sites such as 13WA238, 13WA236, and larger Oneota sites, such as Cribb's Crib (DeVore 1984; OSA 2010). Smaller sites do mention "burned earth", but there is little evidence of hearths or fire features. However, fire-cracked rock is common throughout the cultural affiliated groups as well as prehistoric sites with unknown affiliation.

After reviewing the distributions of sites the following is a model on where sites occur in Warren County: Archaic sites are located within 50 meters of water on terraces and benches. Early or Middle Woodland sites without mounds are found 125 meters to 400 meters from water and located on terraces/benches and floodplains. Further data is necessary to reach a more complete model on where Archaic, Early and Middle Woodland sites could be found. Late Woodland sites without mounds can be found from 100 meters to 800 meters from water on floodplains, terrace/benches, upland ridges and summits. Undated Woodland sites could be expected to be found from 30 meters to 800 meters from water sources on blufftops, fans, floodplains, terrace/benches, and uplands. Mounds are expected to be found 46 to 500 meters from water on blufftops or in one exception a sloped area. Oneota sites are expected to be found in northeastern Warren

County along the Middle River and Des Moines River on terrace/benches, blufftops, and floodplains.

Model Implications for the Survey Area

The property used to test the model is within a half or a mile of Middle River, on the uplands and backslope above the river. It is an area that potentially fits the model for Woodland artifacts because of its location above water and topographical features of flat uplands and ridges. The survey area's distance to Middle River places it at a similar distance of other Woodland sites to the river.

The survey area has potential to provide Oneota remains because of its location in relation to the large Oneota settlement sites near Carlisle and Middle River in the Des Moines River valley. Although the survey area is located five miles from Cribb's Crib, it is located along the same river and is only a quarter of a mile farther from the river than the discovered location. An issue with Oneota artifacts being found on the survey area is the distance from the Des Moines River. The majority of Oneota sites in Central Iowa are located directly near the Des Moines River. In Warren County this means near the convergence of the Middle River with the Des Moines River, several miles from the survey area, and outside of the fertile flatlands of the valley. The model analyzes trends in environmental factors for site locations however, and not human behavior outside of these parameters.

The prehistory of Warren County does not provide great detail of Archaic habitations in Warren County with which to test the model on the survey property. These sites are rare and because of this the probability of finding an Archaic site is less likely

than the later time periods. Lack of Archaic evidence could be due to a bias in archaeology that yields fewer Archaic sites. This bias is multifaceted but could be caused by a lack of interest in Archaic sites by archaeologists, the depths that must be reached in the soil, and the reliability of common survey techniques. It may be that archaeologists are not digging to a subsurface depth deep enough to yield Archaic and Paleoindian artifacts. Studies have also been undertaken to test the reliability of survey shovel testing. Results have shown that typical shovel testing is unreliable on sites with low densities of artifacts (Nance and Ball 1986). These results show that it is possible to miss a site with few artifacts using traditional shovel testing and screening.

Testing the Model

The success of the model rests on the discovery of sites versus nonsites. This refers to the ability of the model to accurately predict site locations based on the information provided in the model as well as the environmental setting of the survey area. The model can be used in the identification of potential site areas within Warren County that have congruencies with the locations discussed in the several environmental aspects of the model. If the area being surveyed does not uncover any prehistoric sites then the survey would have proved the area to be a nonsite in relation to the model (Warren and Asch 2000). If a property being surveyed fails to produce an archaeological site, this does not mean the model is invalid, but rather the property being studied may not have any sites, the survey work was flawed, no artifacts remain, or sites may have been destroyed.

Survey Property Soil and Historical Background

Before testing the model, background information was gathered on the survey property in order to determine a suitable location to survey. The soil and historic background of a survey property could impact the ability to find prehistoric artifacts. Historic and natural disruptions to the survey area could affect what and where items are found.

The survey area's soils vary dependent on the area of the property and the slope. According to the *Soil Survey of Warren County, Iowa*, the Clinton soil that takes up the eastern half of the property is described as dark grayish brown silt loam with the top soil layer five inches thick and the subsurface soil as brown silt loam ten inches thick. According to the soil survey, these soils can have intermittent red clay, grey clay and sand spots mixed throughout. This type of soil is "formed in loess under a native vegetation of trees" (Bryant and Worster 1978:26). The Lindley series soil is "formed in glacial till under a native vegetation of trees" (Bryant and Worster 1978:44). It is described as being located on fourteen to eighteen degree slopes. The soil is often extremely eroded with loam/clay loam soil and exposed subsoil. It is characterized as unsuited for the cultivation of crops (Bryant and Worster 1978). Ladoga soil occurs on a small portion of the property. The soil is a silt loam with a surface color of dark grayish brown. This type of soil has been "formed in loess under a native vegetation of prairie grasses and trees" (Bryant and Worster 1978:41). The Ladoga soil is found on an upland ridgetop with a very gentle slope of no more than five degrees and is suitable for row crops (Bryant and Worster 1978).

The property has several anomalies in the soil. The far eastern border of the property has a large red shale outcrop on the property. This is an occurrence mentioned as possible in all of the soil types listed on the property (Bryant and Worster 1978). However, the property owners believe the shale may be remnants of historic coal mining, potentially burned. Within the drainage paths, there is also grey clay visible along the water ways and within the streams. This is also mentioned as common within Clinton, Ladoga, and Lindley series' soils (Bryant and Worster 1978).

Prehistoric remains have been found on the survey property in the past. A Stone style projectile point was found on the test property by the owners while doing vineyard maintenance. The point was found in a cultivated portion, outside of a drainage path in an area just beyond the deciduous forest and on a historically prairie area. Land disruption in this general area is varied. The projectile point was found when the property owner cut himself on the point while removing soil from a hole, beneath the ground surface. The projectile point was identified as Stone because of its shape, size, and hafting. It is made out of an unidentified stone and likely dates to the Middle and Late Archaic time periods (Morrow 1984). The Stone points are "medium-sized points with a short, square stern and pronounced, sometimes barbed shoulders" (Morrow 1984:47). The distribution of Stone projectile points is typically within Missouri and occasionally in eastern Iowa. They date from 5000 B.C. to 1000 B.C. and are commonly made from untreated chert (Morrow 1984). The owner who discovered the point was unable to identify the specific area from which he removed the projectile point.

The current owners have provided insight into possible property uses that could impact whether further archaeological remains are found. A vineyard has been cultivated

and buildings have been constructed on areas with little slope. The soil was disrupted in the creation and maintenance of the vineyard. Holes for trellis posts and nursery vines were dug using an auger. Outside sand or fertilizer was sometimes added to these holes. Naturally occurring sand on the property was also collected using equipment to be used on the property's road and vineyards. Rodent control also required soil disruption when placing traps or poison, such as in gopher or mole holes. Spaces between vines, rows and posts should have little disruption from vineyard management. Soil disruption from building structures include the construction of a house, driveway, three parking lots, a barn and underground storage, and the movement of soil in the unfinished creation of a drainage pond. Trees have also been removed extensively by the current owners in the creation of the vineyard and structures.

Prior to the current owners' construction, evidence of other soil disruptions were visible during the first survey. Large pits and earthen mounds were scattered through the deciduous forest covering three quarters of the property. The owners attributed these pits to logging ventures as visible in the historical artifacts related to logging on the southern property line. A large shale pile is also visible on the eastern property line. Although potentially naturally occurring, the owners believe it may be evidence of coal mining refuse as is found in Summerset State Park, formerly known as Banner Pits. Further research indicated roads visible on the property as early as the 1930s as well as a change in Fairfax Road along the property's southern edge by the 1950s (Iowa State University Geographic Information Systems Support & Research Facility 2010). Buildings are not visible in the aerial photographs, but several pieces of concrete, as well as a significant

amount of metal have been found along ridgeways on the outer-margins of the survey area. It is unclear if the historic evidence has affected any prehistoric evidence.

Survey Methodology

Possible locations for prehistoric sites were identified through the model. However, the topography of the survey area must be taken into account in determining what prehistoric groups may have been present on the property. The model was utilized in choosing the most likely areas to contain artifacts on the 69 acres.

The survey method was Phase I archaeology, in which a preliminary visit to the survey property identified and noted land formations. Surveyors walked transects looking for any potential artifacts on the surface of the ground as well as any large pits or mounds to be traversed or avoided (Alex 1980). No prehistoric artifacts were visible on the ground surface during the preliminary visit.

After visiting the property the area for survey was chosen based on several criteria. First, the area to be shovel tested must fit the parameters set forth in the model. Areas with large slope were avoided and the property does not have lowlands to test. Similarities in topography and water sources for the survey area with that of known sites were also taken into consideration when choosing the survey area.

The initial area chosen for shovel testing was along the northern property line, extending to a drainage stream that flows into the Middle River. This area had several problems that were identified after visiting the area. First, the area is located on the backslope of the ridge above Middle River. This area is not the high ground of the property but rather more sloped than previously expected. Second, while walking

transects, large circular pits were discovered on the edge and within the forest, as well as areas with irregularly shaped and mounded soil. Two parallel long and straight pits were also discovered in lines from East to West, much like ditches along a road. Because the soil of this area seemed to have been disturbed in the creation of the pits and mounded areas, although potentially naturally occurring, as well as the slope and elevation of the area, the initial survey area was abandoned and a new location for survey work was found.

The area eventually chosen for survey lacked many of the problems discovered in the first location, but had several issues as well. It is located along the southern property line between two streams that eventually converge into the larger drainage stream that flows into the Middle River. The area that was chosen for survey was selected because of its high elevation, lack of slope, mix of prairie and deciduous forest, and location near two drainage streams. The elevation in the area is around 900 feet, similar to several Woodland sites in Warren County. The slope along the center of the survey area was only slight as the hills sloped up to a high point between the two streams. The ridge between streams was at its highest point along a northwest line until it sloped gradually into the forest as the northern and southern streams converged into one. The deciduous forest occurred along the streams and slopes before stopping at the edge of the prairie that spanned the highest elevated points on the uplands and northwest line.

This area provides a water resource with the two small streams. This situation is similar to 13WA140 and 13WA147 which are located between the confluence of streams and Middle River (OSA 2010). The two stream resources could attract fauna to the area. It was at this part of the property that the owner found the projectile point, though it was

undetermined in what specific part. It was this prehistoric evidence that supported the survey on this portion of the property. However, the area was not completely undisturbed by historic peoples. Two garbage dumps are located in this area, the first is along the northern edge of the northern drainage path and therefore not on the area surveyed. The second is located within the survey area, on the northern drop off above the southern stream. Concrete is visible in piles along the southern forest line as well as large pieces of machinery. Along the northern forest line, pieces of machinery are also visible with metal spikes stuck into the earth and impossible to remove by hand. Arial photographs from the 1930s and 1950s give evidence of a road running along the northwest line between the two streams (ISUGISSRF 2010). Evidence of gravel found during survey work proved a historic road was in the area. It is undetermined if the historic use of this area affected the ability to locate prehistoric sites, however, it was chosen because of its potential for archaeological evidence as well as its similarities to the model.

After the area was chosen, the field work began. For record keeping on where the model testing occurred, a survey record was kept and a survey map was drawn with the locations of where shovel tests were made. A datum (A1) was chosen at the southeast corner of the survey area. Transects were then created by pacing ten meters north and west of the datum. The transects were lettered alphabetically starting with "A" and continued through the alphabet every ten meters west of the datum. The lettered transects were then numbered based on the distance of ten meters from the lettered hole. For example, the first hole dug was the datum, named A1. Ten meters north of A1 was a shovel test hole named A2. Ten meters west of A1 was B1 and every ten meters west a new letter was assigned, C1, D1 until the end of the prairie (transect T1-T4) The number

assigned to the letter corresponded with the number of holes that had been dug on that transect. Transect R had five holes and therefore was assigned names R1-R5. Given the southern drainage streams northwestern angle, the beginning transects created a stair pattern as they followed the stream. E1 was directly west of A3 for instance. At each point a shovel test was completed to determine if any artifacts were present.

Because no artifacts had been discovered during the initial walking survey, the shovel testing was undertaken to determine if any artifacts were present under the ground surface. Shovels were used to remove soil from the transect points. Surveyors used the shovels to cut a square of earth from the ground and then removed the soil to a screen with 1/4'' holes. The soil was removed to a depth dependent on the type of soil in the hole and then screened for artifacts. All artifacts, regardless of time period were placed into bags to be cleaned and analyzed. Charcoal fragments were initially collected until it was determined that no trend was apparent in the variety of areas in which the charcoal occurred. Further charcoal discoveries were noted in the field journal but not collected.

Representative soil surveys were taken to show the trends of the soils in the survey. The soil on the northern slope of the southern stream had very little Horizon A, and the Horizon B was a mottling of red and grey clay. The center of the prairie was made up of typical Clinton soil with the five inch thick top soil of dark grayish brown silt loam and a Horizon B of brown silt loam ten inches thick (Bryant and Worster 1978). Through the center of the upland prairie, yellow clay was experienced below Horizon B that was impossible to screen and was therefore checked manually. The southern slope along the northern stream had a substantial Horizon A that exposed the most charcoal and

a Horizon B that extended beyond the length of the shovel. Transect F8 in this area had a great deal of charcoal that was very near the grassy surface, likely from a historic fire.

The shovel testing covered a variety of areas not discussed as potential sites in the model in order to ensure accurate and unbiased testing of the area. These included the highly sloped areas surrounding the streams, where Fairfax Street had originally been located (datum A1), on the small terrace next to the southern stream, and on the slopes of the prairie as the two streams converged. By shovel testing these areas it was shown that the model had a purpose in not identifying these areas as potential sites. No prehistoric artifacts were collected from these areas.

Survey Results

The survey covered 161 holes or approximately 16,000 square meters along the flat upland prairie as well as along the slopes leading to the streams. The survey did yield artifacts. Unfortunately, for the purpose of the prehistoric model, these artifacts were unrelated, historic pieces. The artifacts recovered include: 22 nails, which include seven square nails, 10 round nails, and five unidentifiable nails, a single blue button and a single piece of historic ceramic, uncollected gravel from a historic road, seven pieces of white tile, a flat round piece of metal with a notch out of the edge, five pieces of glass, seven pieces of plastic from vineyard maintenance in a variety of colors, as well as fibers from twine used in the vineyard. Thirty pieces of metal of unknown use or function and wire broken into four pieces were found during the survey. Transect hole H3 provided a wide variety of historic artifacts that may be related to a garbage dump located a few meters from the transect hole in a drop from the ridge. H3 provided the following

artifacts: two washers, a bolt, nine unidentifiable metal pieces, three round nails, wire, and two pieces of metal that have been identified as car parts. An auxiliary hole dug next to H3 provided a thin metal ring, three round nails and two unidentified metal pieces. Transect holes with an unusual abundance of charcoal include F8, J1, and S3, though no prehistoric artifacts were found within these holes. Two possible flakes were discovered but after being analyzed were determined to be naturally occurring. For the purpose of testing the model, no prehistoric artifacts were located.

Results in Context of the Model

Although the survey provided historic artifacts to be analyzed, it did not prove the model to be conclusive for the test property. While no prehistoric evidence was found, the model is still viable in providing information for locating areas with potential sites within northern Warren County. For the test property, it appears there is no further prehistoric evidence beyond the previously discovered projectile point within the surveyed area.

There are several potential reasons why no artifacts were found during the survey. It could be there were simply no other prehistoric artifacts to be found. It could be that prehistoric evidence was missed in the shovel testing. The shovel tests occurred every ten meters between the two streams and northwest until the prairie ended and the forest sloped down to the drainage streams. If there was prehistoric archaeological evidence in the survey area, it may have occurred in areas that were missed by the shovel. Artifacts could have been missed by a few inches one way or another. This calls into question the usefulness of shovel testing. As has been discussed, shovel testing is not accurate in all

situations. It could be possible that the holes were not dug to a depth sufficient to find Archaic artifacts. It could also be possible that a small or isolated prehistoric site was missed because of the ten meter intervals. Although the survey location was chosen because of its environmental elements and similarities with the model, the artifact was a second reason for choosing the location. The projectile point may have been an isolated find, something lost or dropped, or potentially part of a kill site. Regardless of what the point was used for or how it came to be in the survey area, it remains an isolated find.

Further error could be with the model itself. The majority of the issues with the model pertain to the amount of information, accuracy and reliability of the site files provided by the Office of the State Archaeologist of Iowa. The site files are far from complete. Some site files are missing information on a variety of subjects. Information pertaining to specific cultural affiliations, topography, distance to water, the name or type of nearest stream or river, ground visibility, ceramic and stone tool typology and a variety of other items are missing at times from the site files. This missing information could be useful in the research and creation of models.

Recommendations

Although the model did not accurately predict a site on the survey area, there are still issues that must be addressed. To begin, the projectile point discovered by the owners should be listed as an archaeological site for Warren County. However, the location of the exact spot from where the projectile point was discovered remains unknown. The shovel surveying did not find any further evidence to support an Archaic site on the property. But, as is an issue with shovel testing, the accuracy for sites buried

deep in the soil is unknown. Shovel testing is also inaccurate in discovering sites with only a small number of artifacts (Nance and Ball 1986). It would be advantageous to the Office of the State Archaeologist if the projectile point was listed as a site in Warren County, given the very limited evidence and information on Archaic peoples in the area. It could also serve to aid future study of Warren County prehistory. With the permission of the property owners, the state archaeologist will be contacted in determining whether or not the Stone projectile point should be listed as an archaeological site with an isolated find. The projectile point will be returned to the owners.

As for further excavation on the survey area, the projectile point is not eligible for the National Registry of Historic Places (National Park Service 2010). The projectile point has been collected and shovel testing has proved, as thoroughly as possible, that there is no further prehistoric evidence in the survey area.

The historic artifacts that have been collected have been mapped to analyze trends in distribution. The Office of the State Archaeologist will be contacted about the potential for registering the artifacts as an archaeological site. The artifacts are in the process of being further identified for historic significance and time period. The square nails are either Type A (circa 1790-1830) or Type B (circa 1820-1900) cut nails (Visser 1996). If a building was on the survey area during these times, it may not have been visible in the aerial photographs of the 1930s (ISUGISSRF 2010). Because of rust damage, they will need to be analyzed by an expert in order to determine their precise style. Regardless of the type, wire nails were the most popular nail by 1913 (Visser 1996) making these nails at least 50 years old, a parameter set forth in the National Register of Historic Places for consideration as a historic property (NPS 2010). However, the integrity of the site is poor

meaning the site found during the survey would not be considered for the National Register of Historic Places. It could however be identified in the Office of the State Archaeologist as a historic site. More research into what type of site the historic pieces are from will be undertaken before it is registered as a historic archaeological site of Warren County. Further excavations or visits to the property may be necessary given the large amount of above surface historic pieces.

Conclusion

Although no prehistoric artifacts were found, a predictive model of prehistoric evidence in Warren County was created. This model can be used in the identification of potential site locations in the area. It also provides information about the prehistoric people of Warren County. Information on where they lived and what they left behind has been discussed, as well as what made each group unique.

The survey work provided further information about the history of the property. The historic site located on the property will need more research, but it is an intriguing find, and provided a surprise during the survey work. Though the purpose of the site is yet unknown, it will be useful to anyone researching historic sites within Warren County.

The model and survey work will have the greatest positive affect on the subject of archaeology in Iowa. The identification of the projectile point and the discovery of the historic site will provide further information about the history and prehistory of Warren County. Once this information is made available to the Office of the State Archaeologist it can be used by researchers and archaeologists in the creation of their own models or in

the search for sites. The sites discovered in the creation and testing of the model will be an aid in further scholarly work on the archaeology of Iowa.

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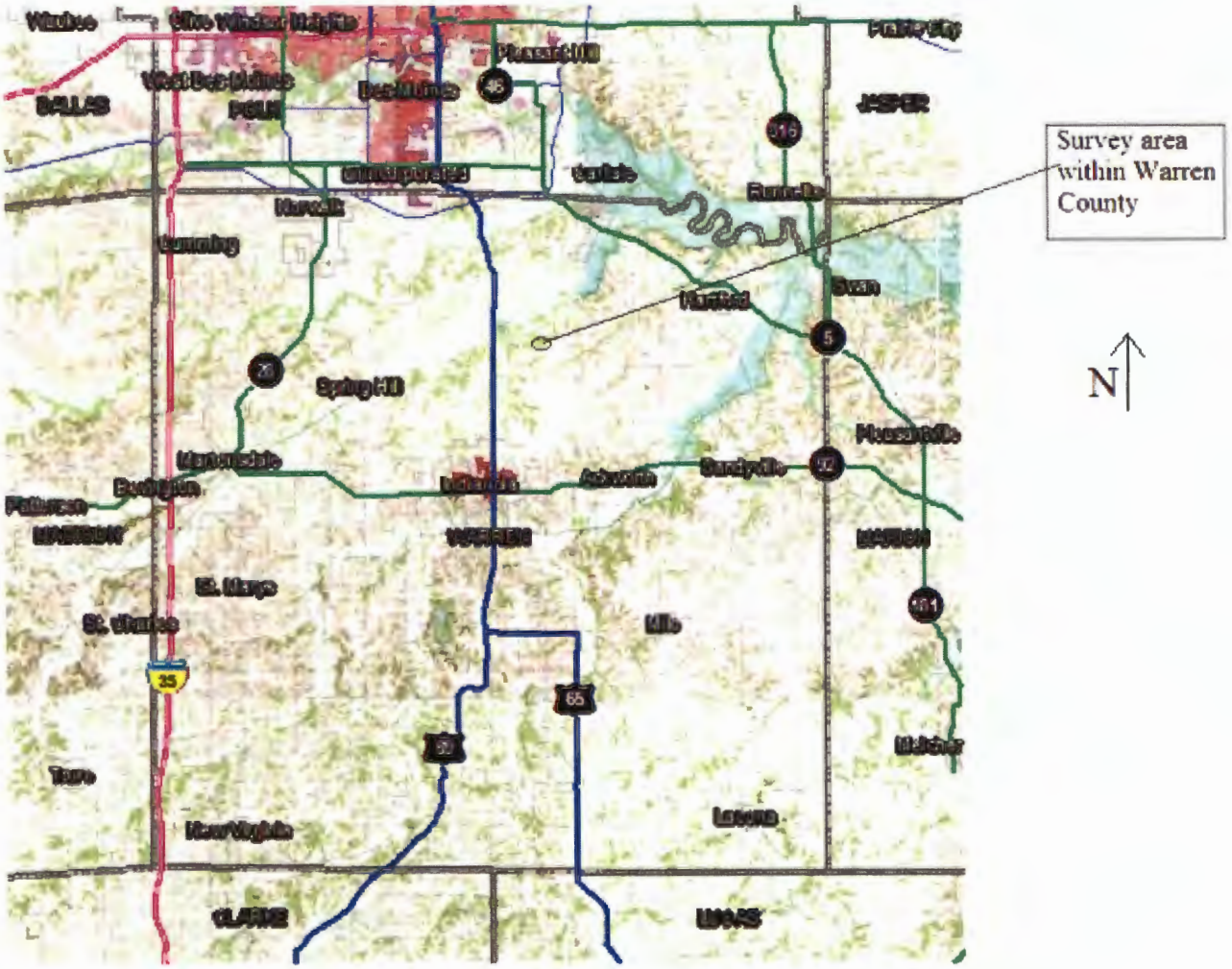
Warren County and Surrounding Area Topographic Map



Taken and modified from 24K Topographic Maps-USGS (ISUGISSRF 2010).

Survey Area Transect Map with Artifact Distribution