

**Investigating Poorly Known Areas of Minnesota:
An Archaeological Survey of McLeod County**

Prepared for the Minnesota Historical Society and the Oversight Board of the Statewide
Survey of Historical and Archaeological Sites

BY

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We would especially like to acknowledge the landowners of McLeod County for their participation in this endeavor. This project would not have been possible without their cooperation and invaluable information they shared with us. We are particularly grateful to those that allowed us to visit their property multiple times and allowed us to reschedule due to adverse weather conditions.

Many others contributed to the success of the McLeod County Survey. This project represents the efforts of many people and it could not have been completed without everyone's assistance.

ABSTRACT

Bolton & Menk, Inc. with our partners from the Geography Department of Minnesota State University Mankato (MSU), conducted an archaeological survey of McLeod County (the Survey) in Minnesota Archaeological Region 2n (Anfinson 2005). Dale E. Maul was the Principal Investigator assisted by Alison Hruby, Austin Jenkins and Gina Aulwes. Team members from MSU include Dr. Donald Friend (geomorphology), Dr. Cynthia Miller (historical geography), Rama Mohapatra (modeling), Dr. Ginger Schmid (soils analysis), and Dr. Forrest Wilkerson (soils analysis). The Survey seeks to enhance the understanding of a poorly known area of Minnesota. The Survey was funded by the Minnesota Arts and Cultural Heritage Fund as part of the Statewide Survey of Historical and Archaeological Sites.

The Survey intended to identify new sites, present the known information regarding prehistoric archaeology in the county, provide updated site files for known sites, and provide a model of site locations. To this end, it consisted of archaeological research and field survey, geological and ecological research, and review of McLeod County Historical Society's collections and those of private collectors. The survey locations and archaeological sites are depicted in Figure A-1.

Geological, ecological and historical research was based primarily on existing information such as LiDAR data, geographic information systems (GIS) data and literature. This component identified possible ecological resources; historically recorded activity areas; drained or dried wetlands, wet areas and lakes; possibly anthropogenic LiDAR anomalies; and areas within this generally wet county where habitable land is likely to be located.

Bolton & Menk contacted 230 landowners to request access for field survey. Selected parcels include those that were preliminarily and informally classed as having low, medium, and high site potential. The Survey targeted over 2,000 acres in 11 townships; within these parcels, 1,615 acres had sufficient ground surface visibility for surface reconnaissance. Fieldwork was completed between March and June, 2012. The field survey methodology included surface reconnaissance using 15-meter, linear transects. When artifacts were encountered, a 30-meter radius was walked at 5-meter intervals to delineate each site.

The Survey identified 15 new sites and confirmed one Alpha Site. All 16 of these are single artifacts or sparse lithic scatters. Thirteen sites were previously recorded in McLeod County. The 29 total sites range from Paleoindian to Mississippian contexts. Fourteen additional sites are inventoried as "Alpha Sites," those that are not professionally verified. The Alpha Sites include historic sites (8), prehistoric sites (5), and a multi-component site. Seven previously known archaeological sites and one Alpha Site were revisited. Sites that were not revisited include those that have been visited within the last 10 years, Alpha Sites post-dating 1880, sites with no viable access and sites where landowner permission was denied.

Background research and fieldwork results made clear that the county held a much greater area of wetlands and lakes until the early twentieth century. Subsequently, extensive drainage improvement efforts allowed for greater agricultural use. Keeping this in mind, we experimented with the Topographic Position Index (TPI; Jenness 2011) measure. A clear correlation exists between known archaeological sites and positions with high TPI values that occur near present and former large areas of water resources.

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ENVIRONMENTAL HISTORY

GEOLOGY & GEOMORPHOLOGY

With no bedrock exposures found throughout, McLeod County is entirely covered in 100-plus feet of Quaternary glacial till (Mossler and Chandler 2009) deposited by the Des Moines lobe of Pleistocene glacial ice consisting of predominantly sedimentary materials (gray, siliceous shale) from the Riding Mountain Uplands of southwestern Manitoba and North Dakota (Lusardi and Jennings 2009). Differences in texture and composition of the till exist across the county with no particular patterns of deposition, as is typical of ablation moraines. Minor reworking of the till by Holocene streams is not likely to be extensive enough to deeply bury archaeological sites.

The heterogeneity of texture of the glacial materials (SSSA 2012; USGS 2012a) creates a lack of any overriding soil regularity (McMiller 1955, Murray 1997), however, hydric soils are commonly found in low lying areas formerly occupied by wetlands and other water bodies, many of which have been drained for contemporary agriculture. Given the chaotic nature of ablation moraine, bodies of water, and thus archaeological sites, can be found throughout the county. Given our work for this project, modeling pre-agricultural water resources was an important first step in determining specifically where archaeological sites are not likely to be identified. Figure A-2 depicts the Quaternary geology described by Lusardi and Jennings (2009). Minor reworking of the till by Holocene streams is not likely to be extensive enough to deeply bury archaeological sites. This is supported by the lack of Entisols (Fluvent) in the county (Murray 1997).

McLeod County is roughly divided northwest to southeast by the Minnesota River Prairie ecological subsection to the west and the Big Woods ecological subsection to the east (MNDNR 2012a, 2012b; Wendt and Coffin 2012). Generally, these subsections are topographically distinct in that the Minnesota River Prairie exhibits the gentle surface of a till plain, while the Big Woods has rounded, rolling hills with closed drainages interspersed between the hills. Throughout the county, major rivers and their tributaries have incised into and reworked the glacial deposits resulting in a variety of alluvial deposits and landforms along their channels.

The glacial features undoubtedly influenced the migration, movement, and daily activities of the earliest human generations in the area. It is estimated that McLeod County was covered with ice as recently as 11,000 years BC (Lusardi 1997). As the ice in the area melted, vast outwash plains covered the landscape which, at first, would have been covered by noticeably sparse vegetation. This undoubtedly limited inhabitation by other animals, which in turn would have restricted human utility for centuries following glaciation. Water features would have been dominant, but the idea that the entire county was basically covered in water is both not plausible and not a gross overstatement. Outwash plains by their nature receive copious amounts of water from melting glacial ice. Loose glacial sediments are quickly incised and much, if not most, of the current drainage pattern was established quickly. While many portions of McLeod County were wetlands and lakes, much as it was just prior to intensive modification for agricultural use, many areas would have been suitable for human habitation.

SOILS

According to the U.S. Department of Agriculture (USDA) and the Natural Resources Conservation Service (NRCS), there are 12 soil associations that are present in McLeod County. With the exception of two soil types located in flood plains, the rest all exist on the shoulders, back slopes, summits and rims of

depressions. They range from well drained and moderately drained loam to very poorly drained clay loam and muck. The parent materials range from till, colluviums, organic materials and coprogenous earth.

Wetlands and soils scientists commonly use the presence of hydric soils to delineate wetland conditions. According to the Minnesota Department of Natural Resources (MNDNR), a hydric soil is a soil that is “saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part.” Soil formation, in effect, occurred during wet conditions (MNDNR 1997). These hydric soil areas in McLeod are assumed to have been generally uninhabitable for humans due to their wet, mucky surfaces, but yet can also be assumed to have been a valuable proximate resource given the myriad of floral and faunal species that occupy wetland areas.

Although hydric soils cover a large proportion of McLeod County, their presence does not suggest that large, interconnected areas were covered by water in the geologic past. These hydric soils can be found on a wide range of formerly wet landforms including depressions, lake plains, relict lakes, swales, swale rims, outwash plains, moraines, and floodplains (Murray 1997). This extensive variety of landforms occupied by hydric soils does not support the theory of widespread areas of inundation, but rather corroborates the high variability of drainage and soil hydrology that is characteristic of glacial deposits. The hydric soil variable is, in effect, not dependent on low relief terrain and should offer a satisfactory surrogate for wetlands and wet areas that no longer exist due to drainage.

ENVIRONMENTAL CONDITIONS & VEGETATION

Given the complex environmental changes that have occurred over the past 12,000 years in the McLeod area, it is likely that the resource base available to prehistoric humans would have likewise have been highly variable over time as climate changes and retreating glacial ice caused multiple transitions between grassland to hardwood forests biomes. This degree to which Minnesota’s biomes have shifted since the end of the Pleistocene has been relatively well documented by geologists. McLeod County is among the areas in Minnesota that have experienced significant ecological changes (Figure 1) (Gibbon *et al.* 2002). It is in light of this shifting ecotone that the vegetation history of McLeod County, and its significance to archaeology, must be understood.

Current interpretations of Minnesota’s post-glacial conditions are thoroughly reviewed by Gibbon *et al.* (2002), and the authors show that changing biomes paralleled major climatic shifts from the end of the Pleistocene through the Late Holocene period. In the vicinity of McLeod County, a spruce parkland-forest biome in the Late Glacial and Early Holocene (ca. 12,000 - 10,000 B.P.) would have initially been dominant, but then was gradually overtaken by an Oak-Elm forest by 9,000 B.P. Next, the prairie advanced from the southwest, moving into the McLeod area by 8,000 B.P. during a warmer and drier period of the Middle Holocene timeframe. This grassland biome lasted until approximately 3,500 B.P. when a deciduous-mesic forest overtook the area from the northeast as cooler and wetter conditions returned and the shifting prairie-forest boundary of the Early and Middle Holocene began to stabilize and gradually reach its modern extent.

Pollen analyses of lake sediment cores in the region provide additional insight into the McLeod area’s paleoenvironment back as far as the Early Holocene and indicate the presence of specific plant species that may have been valuable resources. Pollen analyses from two lakes in the northern half of McLeod County, French Lake and Silver Lake, have been reviewed, two others in neighboring Renville County and Carver County reveal vegetative conditions to the west and east. Lake Allie lies 5 km west of McLeod, while Rutz Lake is 12 km to the east of the county. Figure 2 depicts the locations of these lakes as well as the birch and sugar maples that surveyors used as bearing and corner trees in the surrounding counties. While these

survey patterns suggest that these two species were not widely present in McLeod County in the mid-1800s, pollen analysis indicates that a much more complex distribution of these and other species have existed in the area for thousands of years.

Pollen from Rutz Lake has been dated back to 11,800 B.P. and the most dominant species of trees, shrubs, and upland herbs represented in the samples are shown in Figure 3. The distribution shows a major decline in spruce (*Picea*) ca. 9,000 B.P. and the subsequent expansion of pines (*Pinus*) and oaks (*Quercus*), with the latter increasing rapidly after 3,000 B.P. when they became the most dominant tree species. A variety of grasses (*Poaceae*) were also dominant in the upland after 9,000 B.P., peaking in intensity ca. 5,000 B.P. (Waddington 1969; Stuiver 1975; Neotoma 2012).

French Lake pollen dates back to 3,500 B.P. and shows a similar rise in oak populations occurring after 2,500 B.P., and significant proportion of grasses throughout the entire sampling period (Figure 4). The species with the greatest relative abundance at French Lake from 3,500 B.P. up to the present day are as follows: oak, pine, willow (*Salix*), birch (*Betula*), juniper (*Juniperus*), elm (*Ulmus*), basswood (*Tilia*), ironwood (*Ostrya*) and ash (*Fraxinus nigra*) (Grimm 1984; Neotoma 2012). Silver Lake and Lake Allie cores represent a much shorter chronologic range of pollen samples, but also indicate a similar Pine-Oak and grass dominance from 300 to 450 B.P. (Figures 5 and 6) (McAndrews 1968; Neotoma 2012).

Assuming that the Rutz Lake findings are comparable to conditions 12 – 20 km to the west, the data suggest that a variety of trees and grasses in McLeod could have provided a complex resource base dating back to the Late Paleoindian - Middle Archaic periods. Both the French Lake and Rutz Lake pollen analyses show that after ca. 3,500 an even greater variety of species, including small but consistent numbers of Big Woods species (roughly 5-10% of sampled pollen) that would later become more dominant in the broadleaf forest complex by 300 B.P. (Grimm 1984; Neotoma 2012). In addition to the primary oak-pine-grassland base, all four lakes also indicate the significant presence of birch trees and smaller but consistent numbers of sugar maples through the full range of sample depths and dates. The Rutz Lake area supported small numbers of both butternut (*Juglans cinerea*) and hickory (*Carya*) trees, while the French Lake data indicates populations of these Big Woods species were also present in the area after 1,000 B.P. and 770 B.P. respectively. Silver Lake likewise contained a small but consistent presence of hickory pollen back to 279 B.P. Collectively, these diverse hardwoods would have provided not only fuel and shelter, but also ample amounts of mast for game species (Speer 2001).

Unfortunately the spatial limitations of the pollen evidence does not enable precise mapping of prehistoric vegetation species, so these data could not be included in the development of the predictive model. It should be noted, however, that the pollen results clearly reinforce the assumption that McLeod County offered a complex array of valuable resources, especially during the Late Archaic and Woodland Periods.

Using baseline historical sources from the time of Euroamerican settlement in the mid-nineteenth century, it is possible to speculate upon the variety of foodstuffs and other resources available in what is now McLeod County during periods when both woodland and prairie biomes were present. Consideration of the Marschner (1974) pre-settlement vegetation maps and the Public Land Survey System records is a first step towards estimating resource “richness” in the area. Because Marschner’s maps depend upon generalized approximations of landscape features recorded by surveyors in the 1850s, the utility and accuracy of information taken from these sources must be taken as crude estimations rather than ground-truthed, spatially precise data (Almendinger 1996; Hobbs and Nawrocki 2002). Despite these limitations, it remains undoubtedly worthwhile to examine Marschner’s vegetation types recorded in McLeod County as a general representation of resources available circa 1850 (Figure 7). The northeast-southwest hardwood forest/grassland ecotone is readily apparent in the map. Specifically, the map depicts the presence of seven vegetation coverage types including aspen-oak, river bottom forest,

Big Woods, prairie, brush prairie, wet prairie, oak openings and barrens. Each vegetation class in McLeod offered humans a distinct range of resources and vegetation species composition. Hobbs and Nawrocki (2002) described the vegetation classes and their archaeological significance as quoted below:

Aspen-Birch: Aspen-birch includes both categories (hardwood and conifer) of aspen-birch mapped by Marschner. In both cases, the forests were dominated by quaking or bigtooth aspen and paper birch. These were assumed to be a successional stage leading to either Big Woods or conifer forest. Components of these forest types were present in a successional understory or were co-dominants in the canopy (Heinselman 1974). Aspen-birch may be an indication of a previous fire. Food products and fuel may have been found in this community, and paper birch was an important source of materials for making containers, canoes, and other necessities.

Big Woods: Big Woods is the term used in Minnesota for mesic deciduous forest. It was dominated by sugar maple, basswood and elm, with oaks, hickory, walnut, cherry, and potentially many other species (Heinselman 1974). One key characteristic of this vegetation type is that, to develop fully, it requires protection from fire. Thus, Big Woods vegetation would be expected to be in places protected from fires by high humidity or rainfall, moist soils, or natural firebreaks. Big Woods would have provided hunter-gatherers with food, fuel, and shelter.

Brushlands: Brushlands included brush prairie, aspen-oak land, and oak openings. These were all fire-maintained and usually occurred in the ecocline between Prairie and Big Woods (Heinselman 1974). They may have provided fuel and populations of browsing animals, such as deer, for hunting.

Oak Woodland: Marschner called this community *oak openings and barrens*. This was a fire-maintained community that typically served as a buffer between prairie and Big Woods (Heinselman 1974). Rather than the continuous canopy of a forest, oaks were scattered individually or found in scattered groves. The understory may have been shrubby or grassy. Resources would have included wood and acorns, as well as habitat for grazing and browsing animals.

Prairie: Minnesota prairies were primarily of the tall grass prairie type (Heinselman 1974). They were not ideal human habitat. Prairies dominate the southwestern part of the state where higher temperatures and lower rainfall contribute to the fire hazard. The general absence of trees on these broad, flat uplands is attributable to frequent fire, rather than low rainfall per se. Large herds of grazing animals and some food products were found on the prairies. However, in the prairie regions, hunter-gatherers are believed to have congregated near water bodies where both water and wood were available.

River Bottom Forest: Marschner used this type throughout the state for forested floodplains and river valley bottoms (Heinselman 1974). Typically these are dominated by hardwoods that can tolerate saturated soils for some period of time. These include cottonwood, ash, elm, box elder, and hackberry. In the prairie regions, river bottom forests may be the only source of wood for fuel.

Spatial analysis of these vegetation zones in McLeod County as of the mid-nineteenth century can offer further insight into resource availability. Using focal statistics in GIS, one can estimate the accessibility to multiple plant and animal resources found in each vegetation zone. After converting the Marschner data to raster format, focal statistics capture the variety of map cells (the number of unique values) within the neighborhood (user-defined sample area). In other words, for every raster cell in the county's map surface, the focal statistics will calculate the variety of cell types (i.e., numbers of vegetation zones) that occur within a pre-set circular distance. When one kilometer is selected as the neighborhood, the data rendered will represent the vegetation diversity (as measured by the number of vegetation types) that existed within this distance from each map cell. The resulting data layer identifies "resource rich" areas in which people would have the greatest access to varieties of plants and animal species within a reasonable travel distance. This is a slightly different methodology than that employed by Hobbs and Nawrocki (2002) in their analysis at the state level, and it is better suited for the larger scale landscape found at the county level (ESRI 2011). While it is tempting to include this type of "vegetation diversity index" in the predictive model, the generalized nature of the Marschner data and the surveyors'

inconsistencies in recording wetlands, lakes and other terrain features renders the output ineffective as an accurate predictive variable at large scales (Almendinger 1996).

The patterns shown on Figure 7 tend to confirm that the Big Woods area in McLeod County offered a myriad of valuable, life-sustaining resources in close proximity to habitation sites during the Late-Prehistoric and Proto-Historic Periods.

Figure 8 illustrates an estimation of resource richness that would have been available in McLeod County during the mid-nineteenth century as defined by the spatial analysis process described above. While this exercise captures just a snapshot of a long and complex vegetation history, it stands as a baseline for understanding an evolving landscape. The color gradation used represents a scaled vegetation diversity index based on the number of vegetation zones that would have been accessible within one kilometer of any point on the map. While the map is based on generalized survey data, the results suggest that the east-central portion of McLeod County, particularly in the vicinity of the South Fork of the Crow River, would have offered a greater array of resources within the same distance as compared to the less diverse landscapes in the central and southwest grasslands-dominated zone. While the prairie areas of the southwest and west-central McLeod may have featured valuable game species such as bison, the relative scarcity of other commodities such as surface water and wood for fuel and shelter would have made this part of the country relatively resource-poor for long-term occupation. Given that foragers and hunters are believed to have commonly ranged from 0.5 to 7 km during procurement forays to reach seasonal foods, a wide prairie zone through the southwestern quadrant of the county could have been readily accessed from base camps within the more wooded areas to the north and northeast (Gibbon 2008). Conversely, the corridor along either side of the South Fork of the Crow River, and the area south and east of Buffalo Creek would have offered the resources of as many as six vegetation cover types, accompanying a variety of faunal resources. While we do not know whether or not the trails noted on the surveyors' plats pre-dated Euroamerican settlement, it is interesting to note that the segments that surveyors did choose to include on their plats wind through the most resource-intensive portion of the county as defined by Marschner vegetation types in the area, perhaps indicating that access to these resources may have been important well before the nineteenth century.

Another resource found in McLeod County that could have helped to sustain seasonal human occupation is the sugar maple (*Acer saccharum*) (Figure 2). While archaeologists and ethnohistorians cannot unequivocally determine that the production of maple sugar derivatives is a prehistoric cultural trait (Mason 1985), others argue that sugar sap could have been used as a nutritional supplement well before European contact. Occasional use of sap or syrup remains plausible either as a late winter-early spring beverage supplement, or as a famine food in lean years (Munson 1989). Despite the longstanding debate over the origins of sugar making in North America, the presence of sugar maples as a potentially useful predictive variable in Minnesota archaeology predictive site modeling has been demonstrated by its inclusion in both Phase 2 and 3 of the Mn/Model analysis. Using distance to sugar maple tree data generated from the Public Land Survey data as a late pre-contact site variable, the authors include the species as one of the “key resources” available in Minnesota for hunters and gatherers. They determined that sugar maples served as a source of sugar and it is likely that “seasonal camps were established near groves of maples to take advantage of this resource” (Hobbs and Nawrocki 2002).

The U.S. Public Land Survey data contain bearing and corner tree information, including species type and location, recorded by the surveyors in the field. While these datasets are prone to the selection bias and non-uniformity of the surveyors' collection methods, the presence of tree species in the field notes do indicate ready access to these resources. In McLeod County, surveyors used sugar maples as bearing and corner trees that ranged in size from six to twenty inches in diameter primarily in the far northeastern corner of the county, indicating that stands of the species were more commonly found deep in the Big

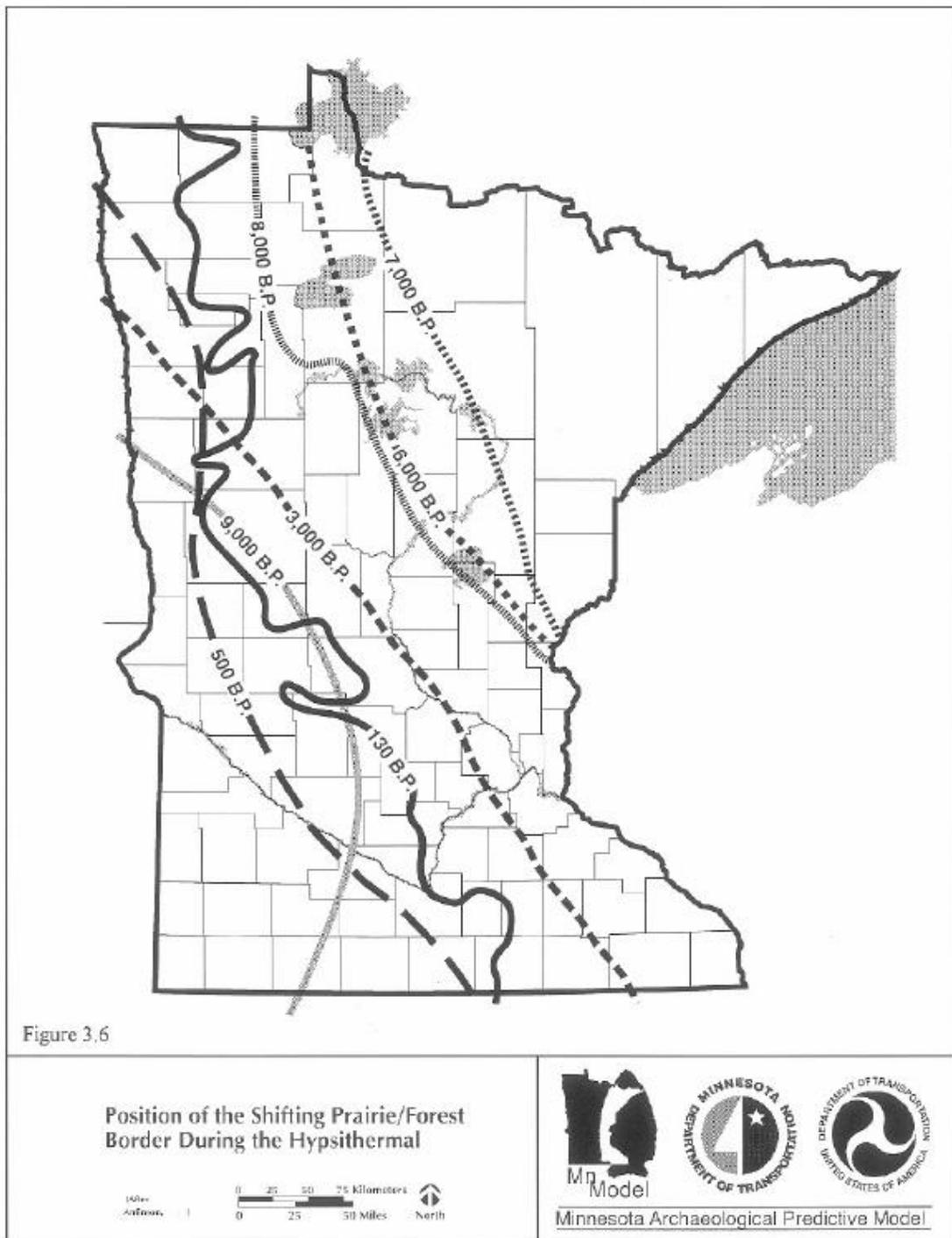
Woods region at the time of the nineteenth-century surveys. Access to these trees could have been a benefit associated with winter and early spring habitation sites in the area (Minnesota DNR, n.d.).

In the 1860s the South Branch of the Crow River was known as the “Hassan River,” which appears to be the name used by native inhabitants. Early historians attributed the stream name as having been derived from the Indian words *haza* or *hahzah*, which referred to the huckleberry or blueberry (Upham 1920). Upham (1920) notes that when combined with the prefix *chan-* or *ćan-*, the meaning translates to sugar water or sap of sugar maple trees. According to S.R. Riggs (1852), “*ćanhassan*” and “*ćanhanpi mini*” translate to sugar water or sugar water sap, while “*ćanhasan*” was used for hard or soft maple. Other Siouan language lexicons also support this possible reference. *Canhasan* is the Lakota translation for “the sugar of the maple,” and the Dakota word *canhapi* as meaning “sugar” or “tree sap” (Buechel and Manhart 2002; Munson 1989).

Another valuable resource in the northeastern part of the county may have been wild rice (*Zizania palustris*) (Figure 8). Evidence of this lacustrine plant species is found on the 1856 surveyed plat of Glencoe Township (T115N, R28W) that shows the label “Rice Lake” on a body of water located in Section 7. While the county is not known as a significant rice producing area today, a 2008 survey of the state’s natural wild rice distribution identifies three local sources of the species in McLeod: (1) the same Rice Lake in Glencoe Township as noted in the survey above; (2) Grass Lake in Winsted Township (T117N, R27W); and (3) a pond located on the Schaefer Prairie Preserve in Section 34 of Sumter Township (T115N, R29W). Seasonal occupation sites in these vicinities, especially at 21MC0001 on nearby Lake Winsted, could be associated with ricing activities. It appears that at the time of the Public Land Survey, resources in the northeastern portion of the county were consistent with those described by Holman to have supported prehistoric sugaring sites in proximity to other seasonal resources such as game, fish and rice (Holman 1984).

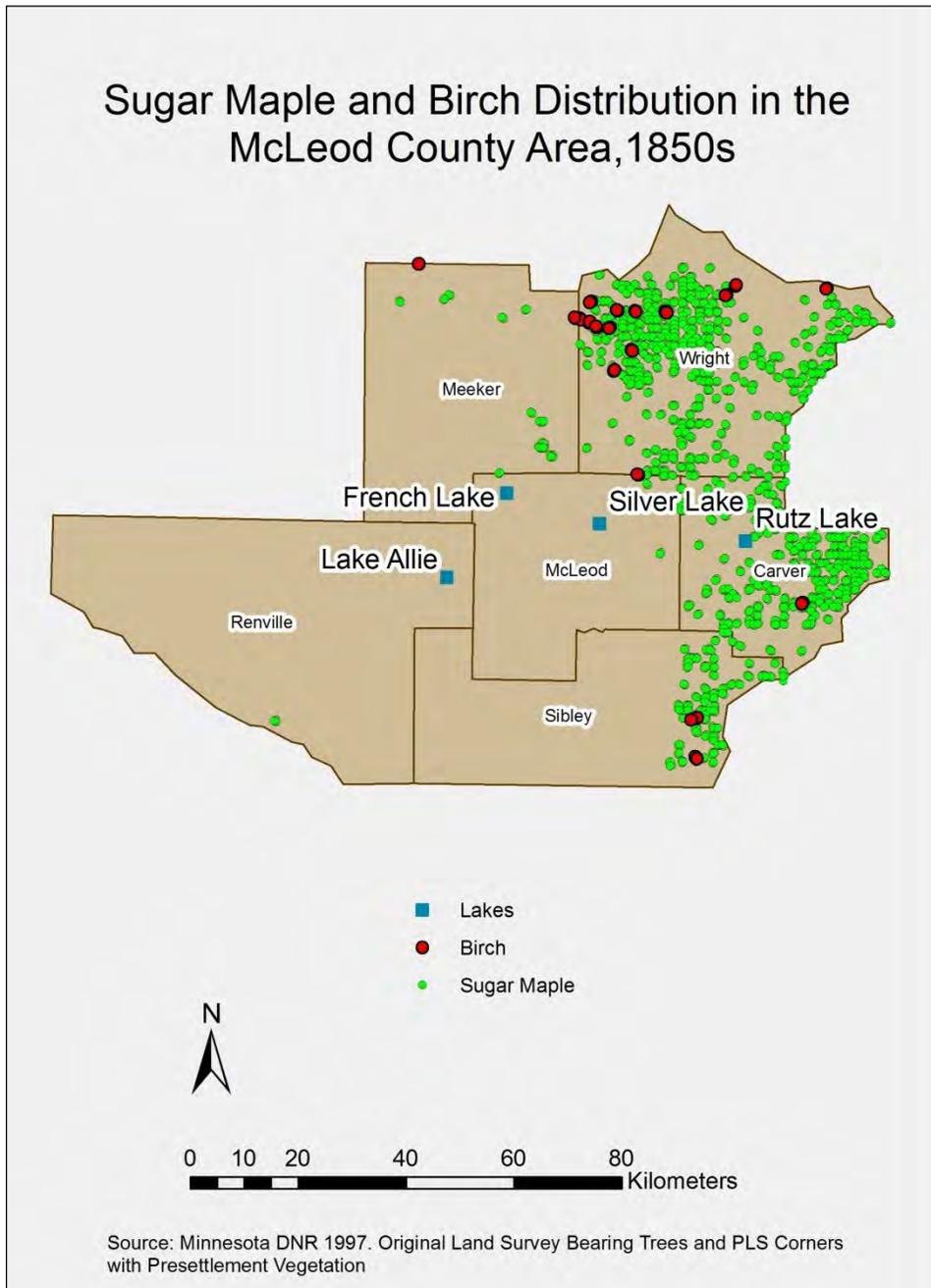
Early accounts written by European-American settlers also provide insight into other landscape resources that were available in the Big Woods region of McLeod County. One observer noted that the forest contained trees “so thick and large” that a traveler could “scarcely see a rod ahead,” and that summer foliage in the Big Woods obscured the sky from a viewer on the ground (Curtiss-Wedge 1917). American ginseng (*Panax quinquefolius*) also grew prolifically on the shaded floor of the forest and was widely known for its medicinal effects (Curtiss-Wedge 1917; Corwin, et al 2009). Early settlers also harvested wild game such as grouse, prairie chickens, duck, geese and pigeons in the area, and caught bass, pike, crappie and sunfish from local lakes and streams, suggesting that the same resource base was also available for prehistoric occupants when hardwood forests/prairie biomes existed in the past (Curtiss-Wedge 1917).

Figure 1 – Shifting Boundary between Prairie and Forest Biomes since the End of the Pleistocene



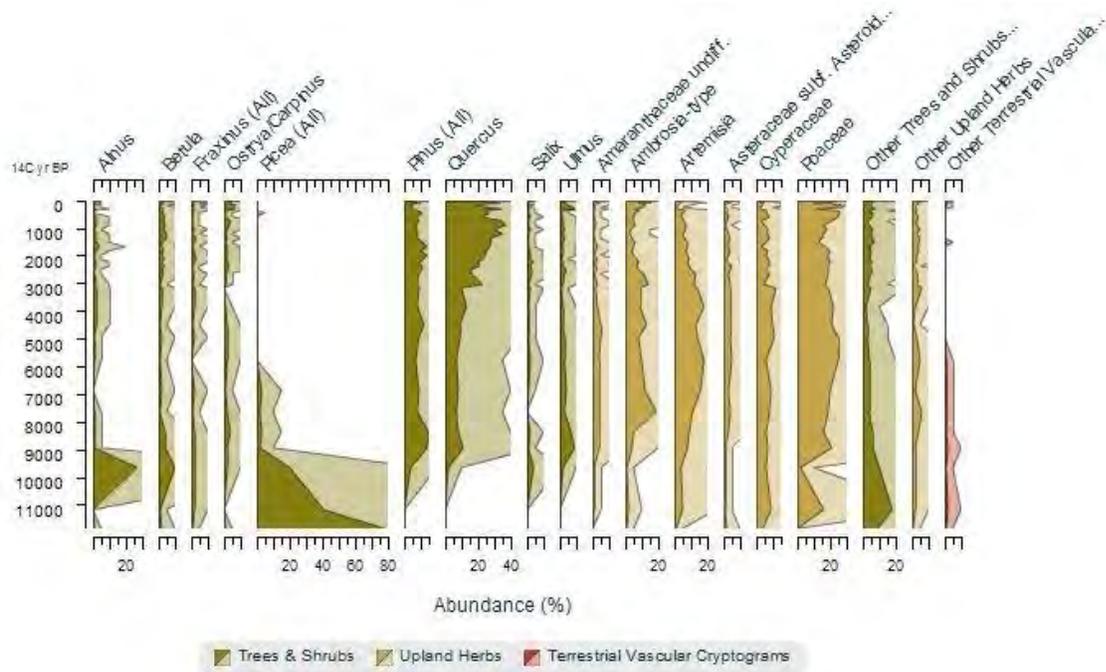
From Gibbon *et al.* 2002

Figure 2 – Sugar Maple and Birch Distribution



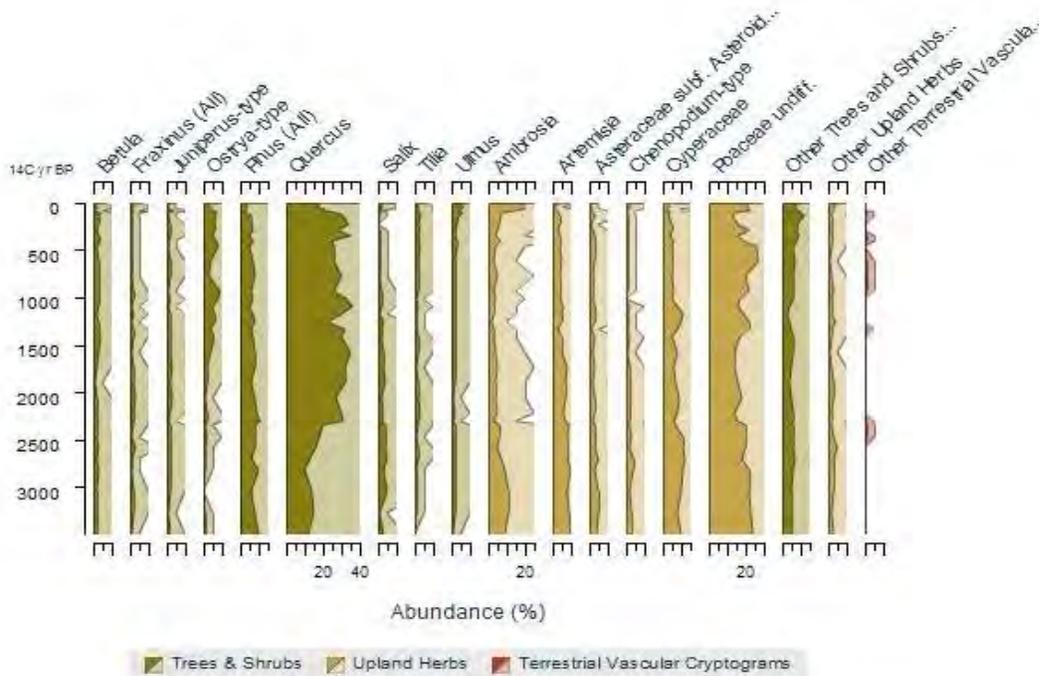
Note: The distribution of Birch and Sugar Maple trees included in the US Public Land Survey data. The locations of the four lakes that have been sampled for paleoenvironmental pollen content in the McLeod County area are also shown.

Figure 3 – Rutz Lake Pollen Abundance



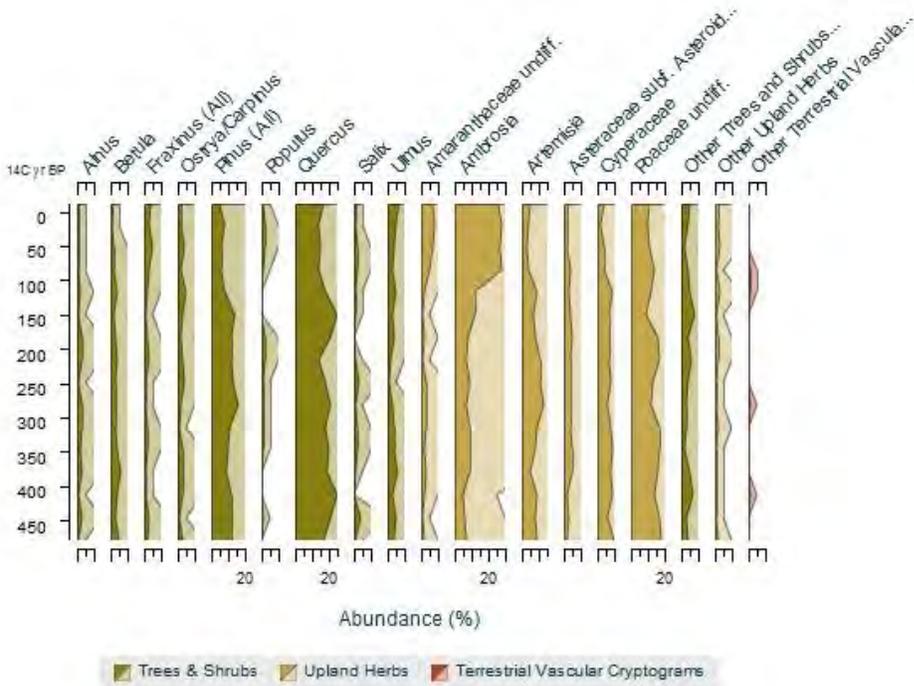
From Neotoma 2012 (Waddington 1969; Stuiver 1975)

Figure 4 – French Lake Pollen Abundance



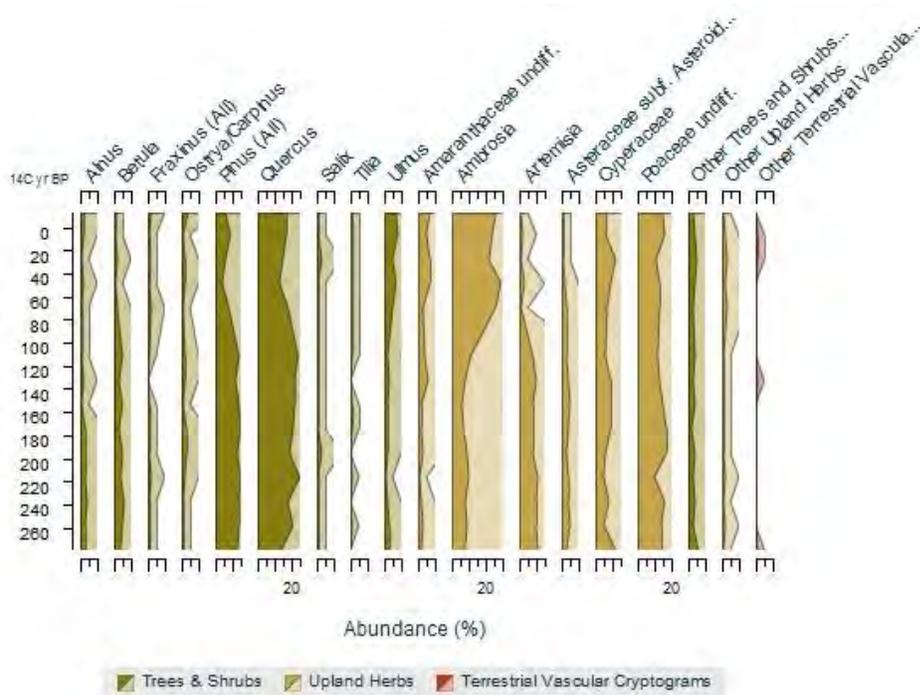
From Neotoma 2012 (Grimm 1983)

Figure 5 – Lake Allie Pollen Abundance



From Neotoma 2012 (McAndrews 1968)

Figure 6 – Silver Lake Pollen Abundance



From Neotoma 2012 (McAndrews 1968)

Figure 7 – Vegetation Types in McLeod County, 1850s

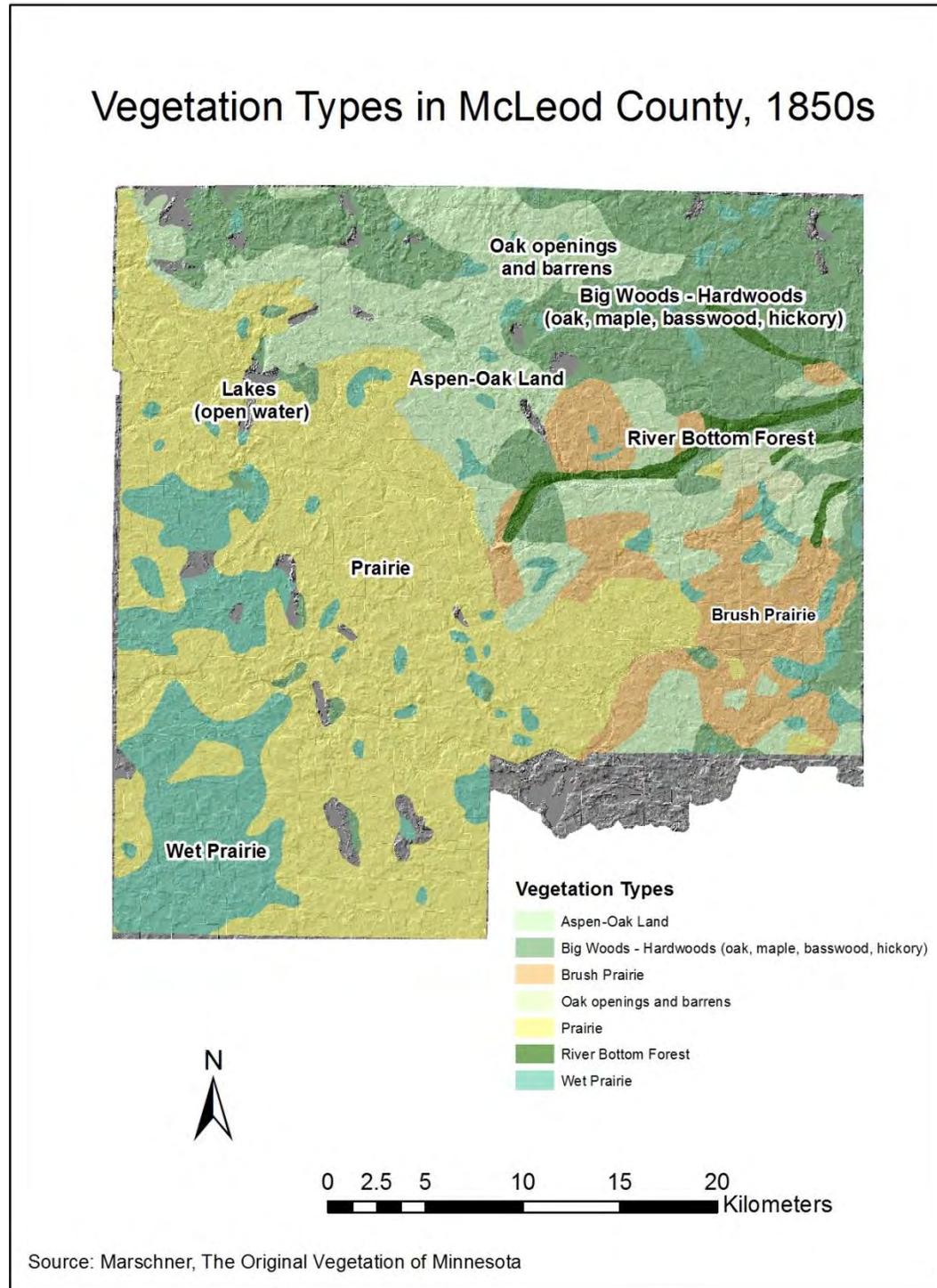
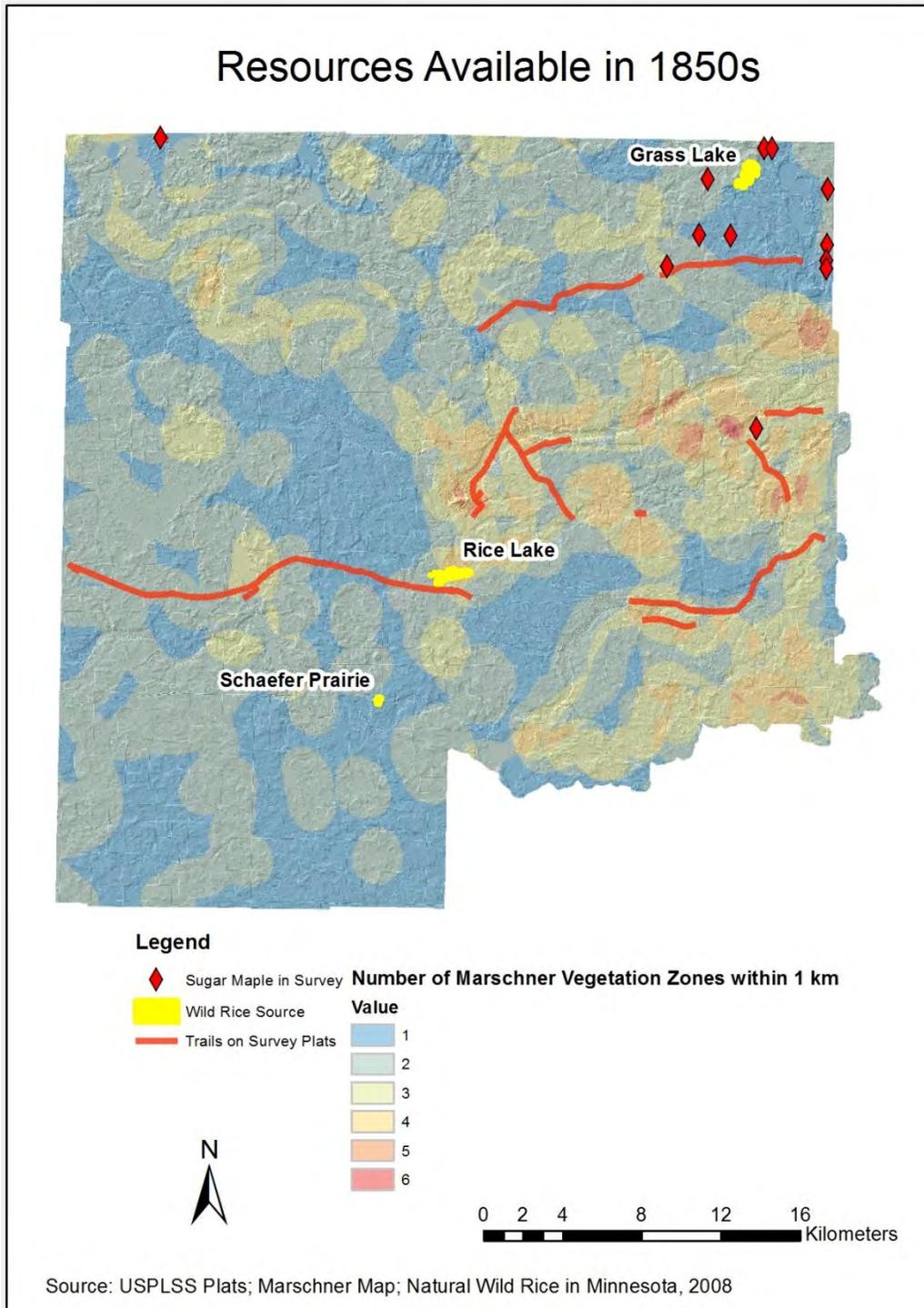


Figure 8 – Resources Available in 1850s



HISTORICAL DRAINAGE IN MCLEOD COUNTY

Reconstructing the landscape as it existed in the past is difficult due to the complex biome shifts that took place over the past 12,000 years in the McLeod County area. Bodies of water varied in depth and extent over the millennia depending on changing climatic conditions, so the transformative effects on the terrain would have been significant well before human modifications occurred. The geomorphic analysis of soils and natural drainage is therefore inadequate for effective predictive modeling because more than a century of artificial drainage has significantly altered the natural terrain development processes.

Assessing the extent of human landscape modification is problematic because the means of measuring and recording pre- and post-wetland drainage extents are highly variable in the historical record. Quantitative data describing wetland conditions in early-twentieth century literature cannot statistically be compared to modern estimations because the very definition and concept of both wetlands and watersheds have changed over time. Any comparison of past versus present statistics should be used cautiously for descriptive analysis only. With this in mind, it is useful to evaluate historical descriptions of wetlands in the county to understand the ways past land owners modified the natural drainage on their properties.

Modern analyses of American agricultural drainage practices show that McLeod County is part of the most highly modified areas in the nation in terms of surface hydrology, and USDA census data indicate that roughly 40 - 60% of harvested acreage is now drained by sub-surface tiling (Figure 9). National Wetlands Inventory (NWI) data mapped at the county level also indicates the extent of surface drainage ditches that have modified the normal surface hydrology and carry away water from the tilled fields (Figure 10). Histories of agricultural drainage in Minnesota show that the first drainage initiatives supported by the state date back to 1858. Subsequent legislation further established local-level drainage procedures and defined the jurisdictional powers of local government authorities (Wilson 2000). As a result, most of the public drainage ditches in the state were built between 1860 and 1920, and drainage construction peaked in the decade of the 1910s (Granger and Kelley 2005). The first methods employed during this early stage generally involved the channelizing of existing streams and making new drainage ditches (Busman and Sands 2002). In later decades, the use of sub-surface tiling expanded along with the network of ditches. By the end of the twentieth century, McLeod County's public drainage ditch network measured 320 miles in length (McLeod County 2003). Using the United States Geologic Survey (USGS) Geographic Names Inventory System dataset, the locations of twenty "lakebed" place names are listed, indicating that at least this many former bodies of water had been drained by the 1960s (Figure 10) (USGS 2012b). A lake being defined as an enclosed basin filled or partially filled with water that is large enough to produce wave-swept shores (MNDNR 2012c).

Estimates made by the Minnesota Department of Natural Resources suggest that as much as 50,000 acres of wetland existed in McLeod County in the mid-1800s but that only about 6% of that amount remained by the 1980s. At the time of Euroamerican settlement, approximately 16% of the county's surface area would have been classified as wetland using modern standards (MNDNR 1997). A 1919 study of agriculture in Minnesota lists the extent of "marshes and bogs" as 5.25%, a value that seems to have excluded lakes from the calculation (Leverette et al 1919). Another compilation of water resources in the state dating to 1910 estimates that of the original 9,000 acres of "swamp area" in the Crow River basin in McLeod County, 7,000 acres (approximately 78%) had been "benefitted by drainage" (Minnesota State Drainage Commission 1912). Though these statistics vary depending on their baseline definitions, they clearly indicate that significant areas of the county were drained by the early-twentieth century (Figure 11).

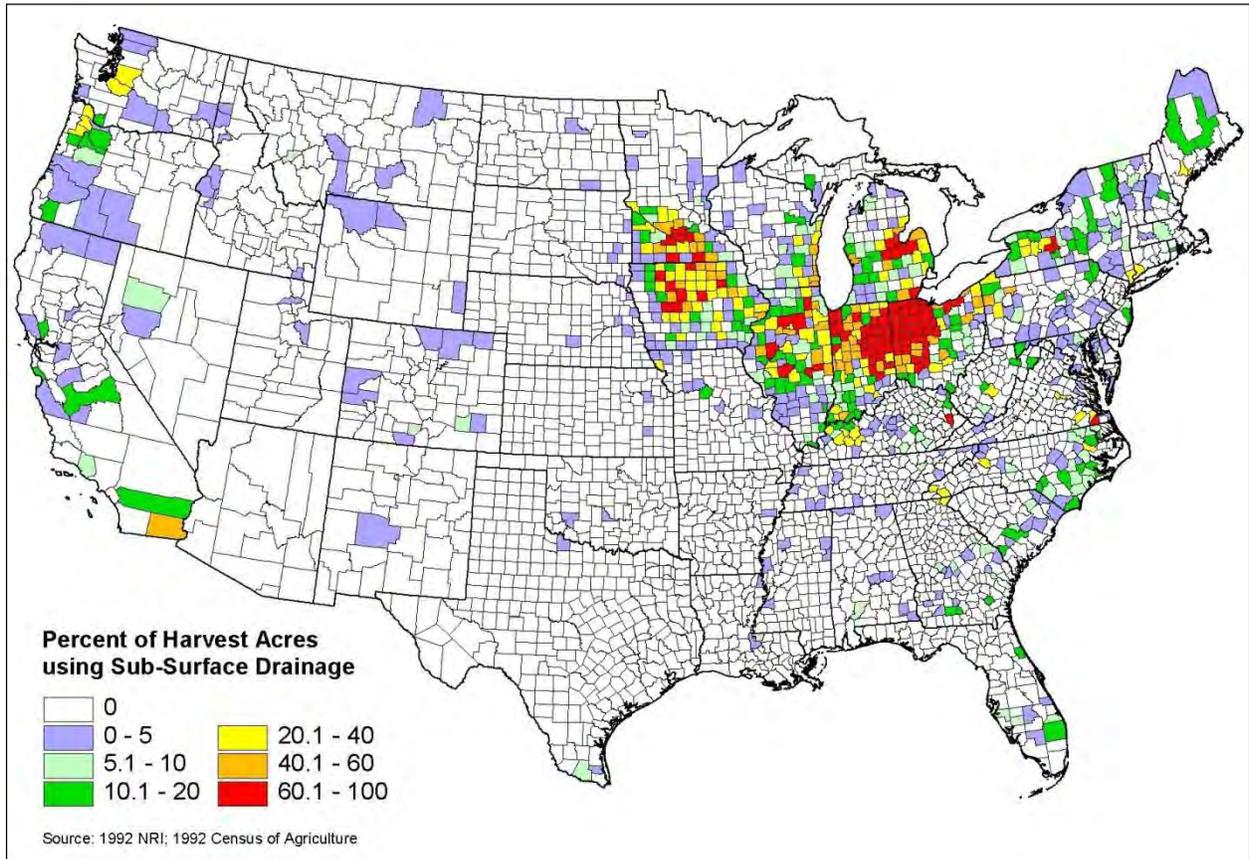
The following case study of an early local drainage improvement project illustrates the processes that took place in McLeod County during the early 1900s. Silver Creek originally passed through Bergen

Township in the eastern part of the county and drained to the northeast into the South Branch of the Crow River. Brush Lake, one of the twenty drained lakes noted above in the Geographic Names Information System (GNIS) database. It was a 35 acre body of open water along the course of Silver Creek in the southeast quarter of Section 21 and the southwest quarter of Section 22 (Figure 12). The lake had been a popular fishing location for area residents. In 1894, farmers in the watershed unsuccessfully petitioned the Bergen town supervisors to construct a drainage ditch to make their land more arable. Ten years later, sixteen farmers again petitioned for the project and as a result County Ditch 5 was established in 1904. A dredger who lived in Section 28 carried out the work by building a drag line mounted on a boat. As the vessel floated downstream, the dredge dug the drainage channel. As the work progressed, the crew lived on a houseboat that was pulled behind the dredge (Figure 13) (Dammann 1986). When the project was completed, Brush Lake ceased to exist and most of the former Silver Creek wetlands were farmed in the later decades (Figure 14). At present, a network of ditches that continues to drain the area is clearly visible on the LiDAR surface (Figure 15) although a simple visible-spectrum aerial photograph depicts little obvious evidence of the previous open water on the landscape (Figure 16).

This small drained watershed can also illustrate how the predictive model layers used in this project represent the historic wetlands of McLeod County. Figure 17 shows the hydric soil areas (defined as \geq 70% hydric composition + ponded soil types, displayed in red) that serve as indicators of probable presettlement wetlands. The total surface area of the county designated as “hydric” using the criteria described above is 17.5%, a number that very closely matches the MNDNR’s estimation that approximately 16% of the county’s acreage consisted of wetlands in the 1850s (MNDNR 1997).

The higher terraced landforms (generated using the Topographic Position Index or TPI) that most likely were not inundated by water in the past are depicted as green in Figure 17. These two layers are the basic “wet” and “not wet” surfaces represented in the model, and they serve along with several other variables to establish areas of low and high probabilities respectively for archaeological sites. These components form the foundation for the predictive model discussed more fully in the Methodology and Discussion sections of this report.

Figure 9 –Most Intensely Drained Agricultural Regions of the United States, 1992



From Scherer 2009

Figure 10 – Extent of Drainage in McLeod County

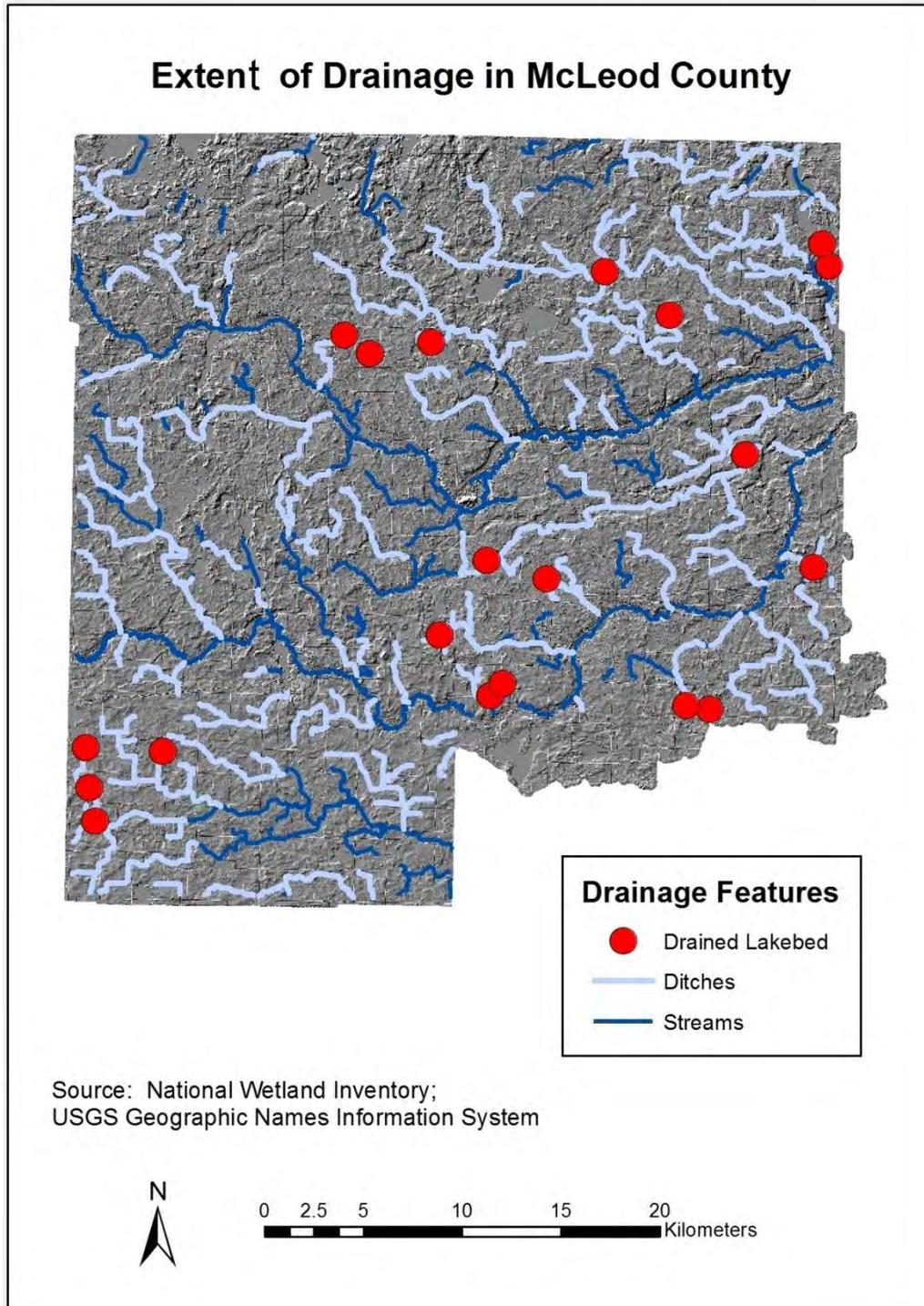


Figure 11 – Drained Land in McLeod County c. 2010

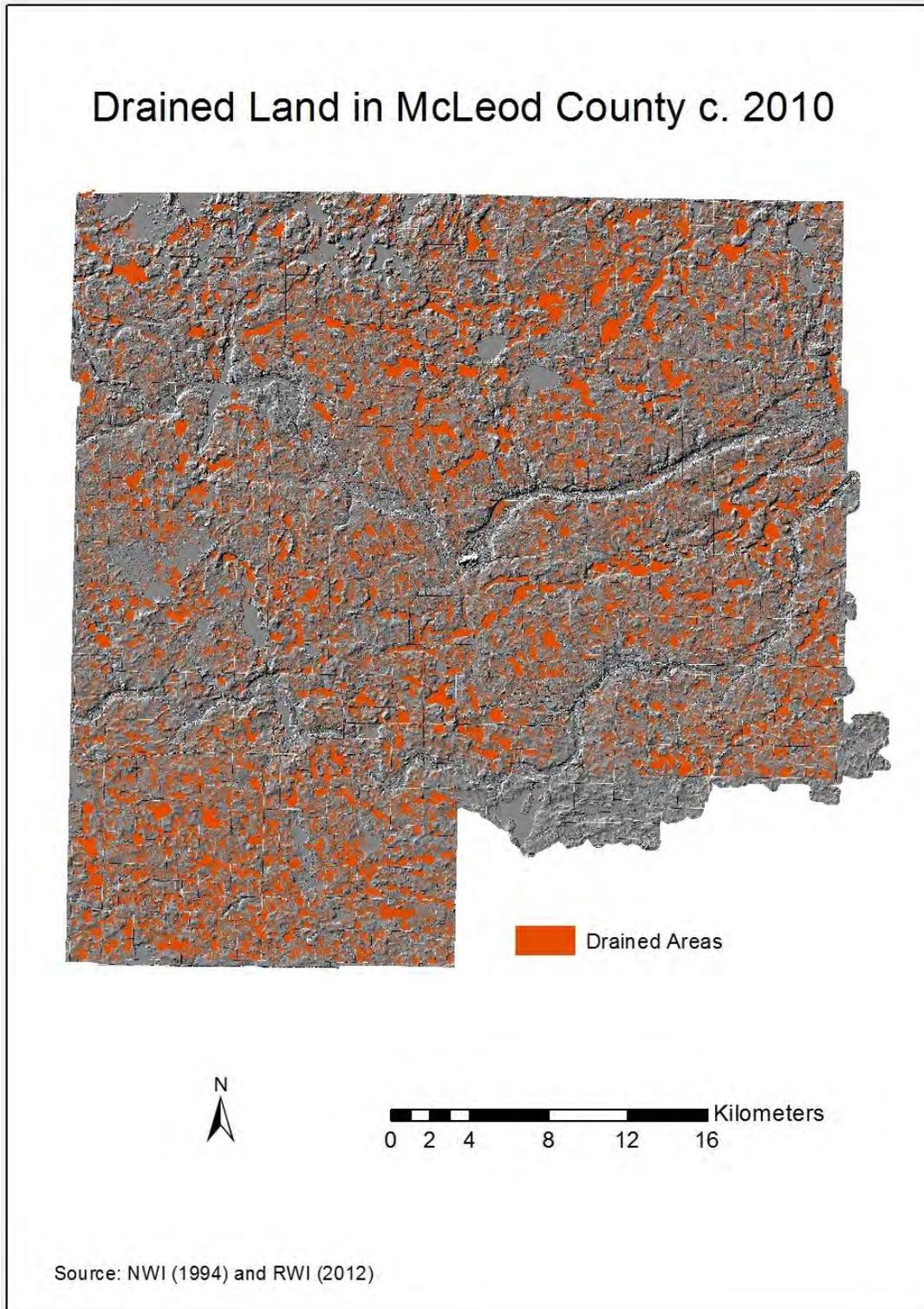
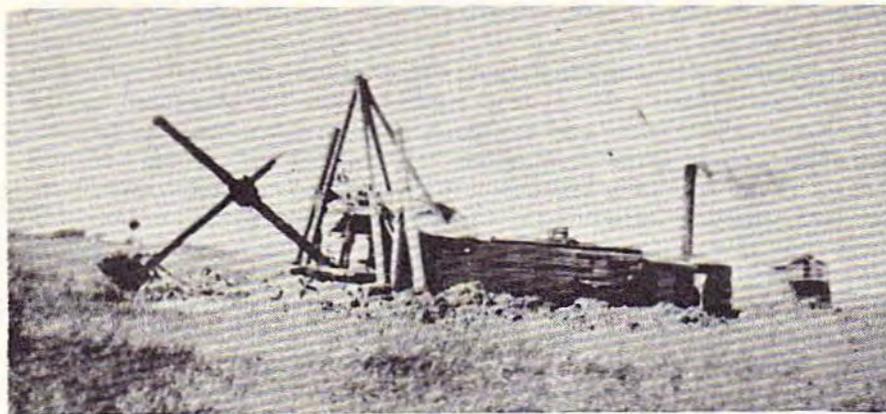


Figure 12 – Original Silver Creek Watershed and Brush Lake, Bergen Township, 1880



Source: Dammann 1886

Figure 13 – Dredging Equipment Used to Construct McLeod County Ditch 5, 1904



Ditching about 1900



House boat pulled behind the dredge that dug County Ditch #5.

From Dammann 1986

Figure 14 – Former Location of Brush Creek in Bergen Township, 1955



Source: OL-2P-9, June 16, 1955. Photo Available on the Borchert Map Library Minnesota Historical Aerial Photography Online Website at <http://map.lib.umn.edu/mhapo>

Figure 15 – Modern Brush Lake Area Topography, Bergen Township

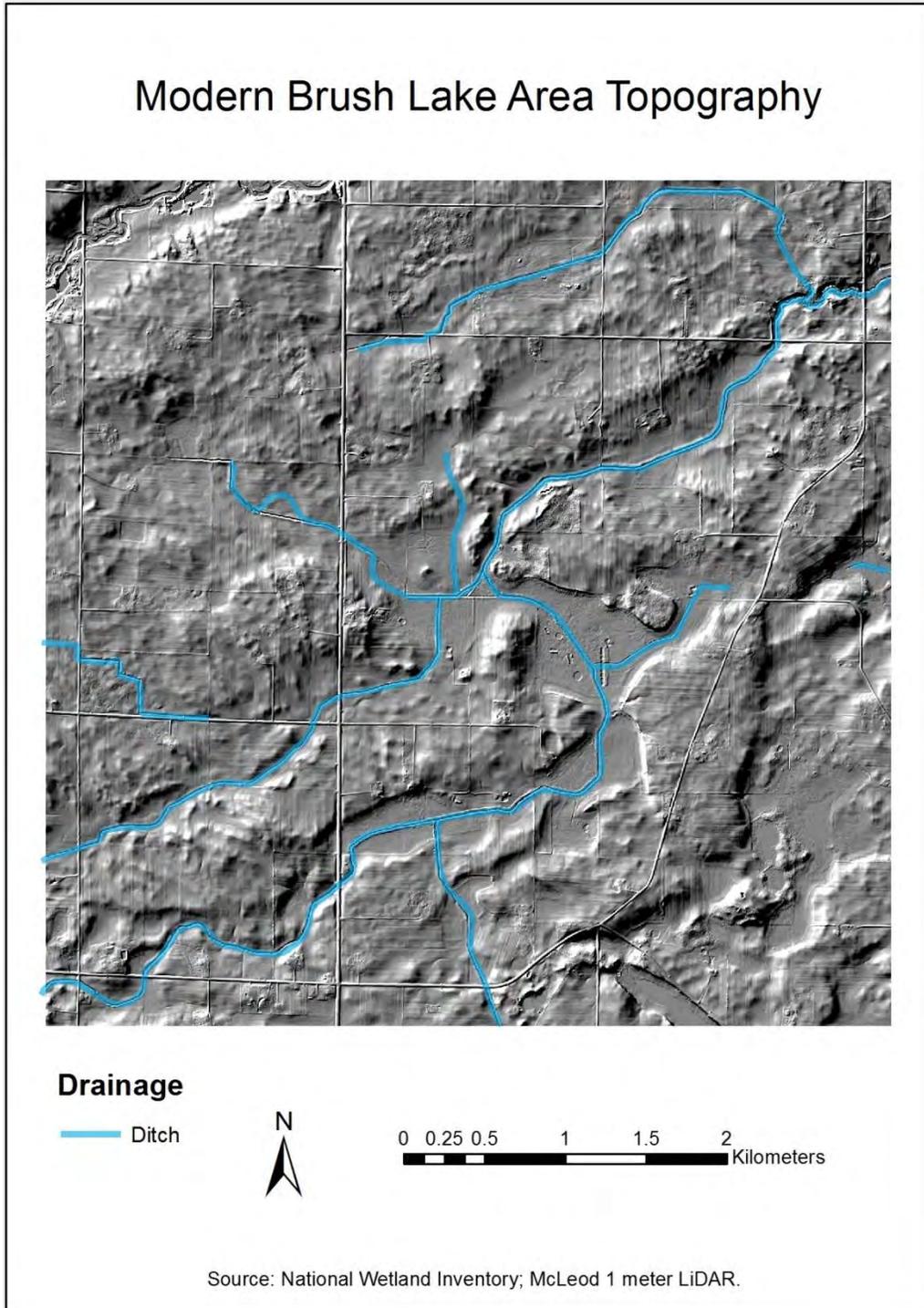
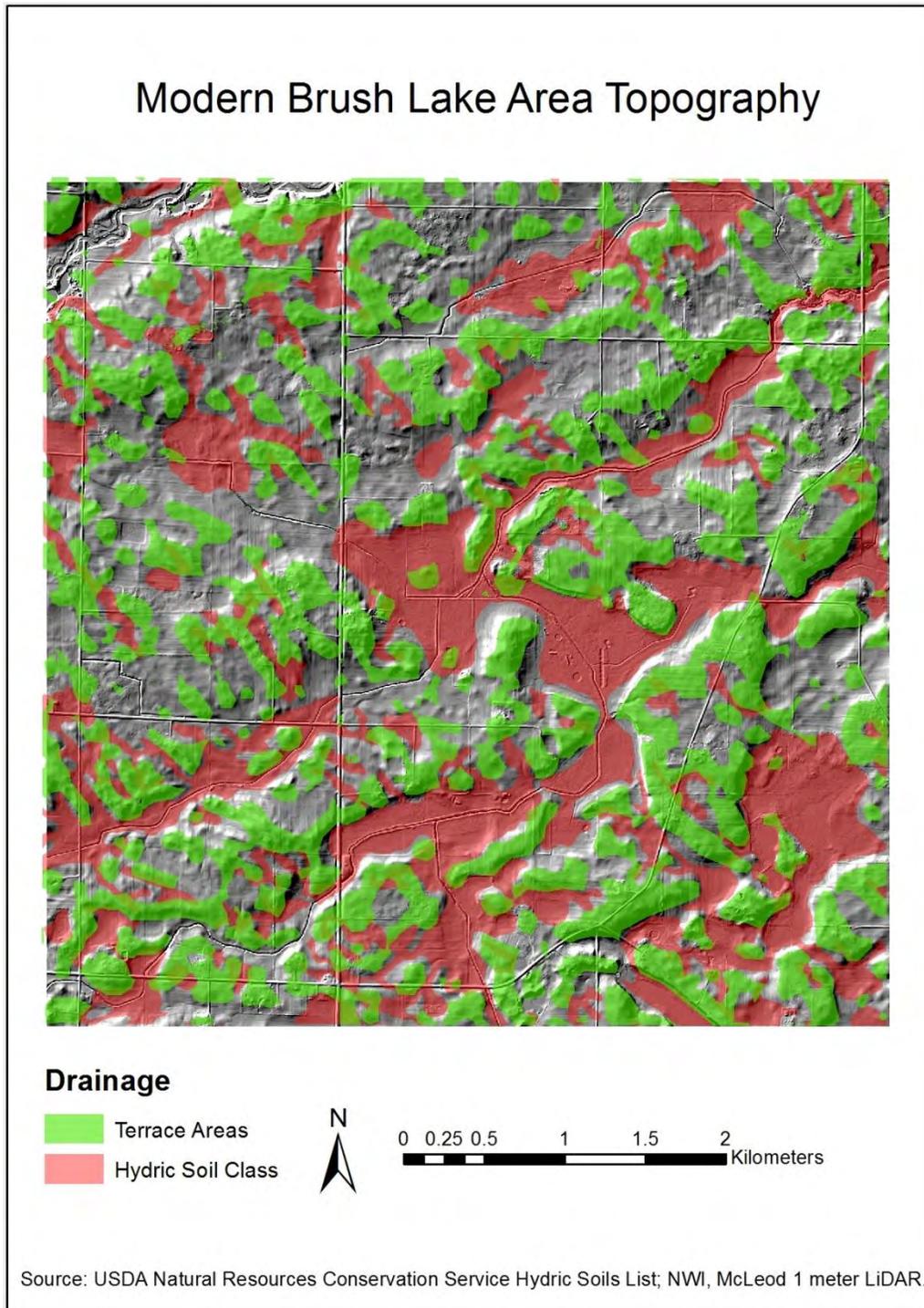


Figure 16 – Modern Brush Lake Area 2010 Imagery, Bergen Township



Figure 17 – Modern Brush Lake Area Topography, Hydric Soils and TPI Model



ARCHAEOLOGICAL CONTEXTS

McLeod County is located in a transitional area of the state, with the prairies to the south and west and the hardwood forests to the north and east. The County partly lies within the Prairie Lake Region, a region within southwestern Minnesota that was defined in Anfinson (1997) based on both naturally occurring elements and cultural patterns. The Prairie Lake Region contains prairie tallgrass vegetation and concentrations of shallow, alkaline lakes. This region also appears to have inhabitants that exhibit similar behavioral patterns, especially in terms of the period from 3,000 BC to AD 900 (Anfinson 1997: 2).

The County itself has also undergone environmental and climatic transformations that have affected resources available for its early inhabitants. There are not many known archaeological sites within the county, and many of the sites have not been assigned to a specific archaeological context. Of the sites that have been assigned to a context, the most common is Woodland. There are five Woodland sites, of which one also contains Oneota tradition, and one is suspected to contain Plano and Archaic, and confirmed Plains Villiage affiliated artifacts. One site has been categorized as suspected Plains Village tradition. Seven sites have not been affiliated with a specific context or tradition; they are identified as prehistoric or pre-contact.

PALEOINDIAN TRADITION

The Paleoindian Tradition within McLeod County is poorly understood. There have been limited surface finds by collectors and landowners, primarily projectile points. As of 2012 one archaeological site is suspected to contain Paleoindian artifacts, specifically from the Plano context, 21MC0012. Most of what we know about the Paleoindian Tradition in McLeod County is based on comparisons with excavated sites found elsewhere in North America. In all likelihood, people began migrating to McLeod County once the land was able to support a variety of plant and animal resources after the retreat of the glaciers, sometime after 14,000 cal BP (Buhta et al. 2011). The people of the Paleoindian Tradition were hunters and gatherers that took Ice Age megafauna, medium and small sized animals like deer, rabbits, birds and other mammals, as well as berries, seeds, nuts and other plant resources (Johnson 1988; Mississippi Valley Archaeology Center 2004B). The ground moraines of the retreating glaciers left the swell and swale topography. These low-lying areas and gently rolling hills contained many shallow lakes of varying size (Anfinson 1997:1). These lakes held an abundant variety of lacustrine resources such as fish, waterfowl, and muskrats. Riverine and wetland resources such as shellfish and waterfowl and wetland plants would have also been important food sources. Their settlement pattern is poorly understood, although it is hypothesized that the hunters and gatherers may have lived in small family groups, traveling to find food and resources to sustain themselves (Office of the State Archaeologist 2012; Mississippi Valley Archaeology Center 2004B). Likely, the local environmental circumstances would have affected technologies, subsistence, and overall adaptations (Buhta et al. 2011).

The Paleoindian Tradition in Minnesota has been further divided into two cultural groups which are based primarily on their point typology (Higginbottom 1996). It is divided into early, Llano and late, Plano. Llano points are fluted, with Clovis and Folsom being the most common known types. Plano points are unfluted and found in a variety of forms and styles (Gibbon 2012). Toolkits would have minimally included spear points, scrapers, drills, gravers and hammerstones. It may have also included bone and wooden tools (Mississippi Valley Archaeology Center 2004A).

ARCHAIC TRADITION

The Archaic Tradition (6000 BC to 800 BC) is a time period marked by a wider exploitation of subsistence resources and a greater development of regional cultural variations, all occurring in a time of environmental and climatic transformations. Like mentioned previously, McLeod County was found at the transition for the prairie and forest biomes. Throughout the Archaic Tradition the environment was constantly shifting. The beginning of the Archaic Tradition is marked by a warmer and drier climate, contributing to the extinction of some species such as the Ice Age megafauna. The climate again became cooler and moister by 3000 BC (Anfinson 1997: 42).

Minimal archaeological sites are attributed to the Archaic Tradition. One site is suspected to be affiliated with the Prairie Archaic Tradition within McLeod County, 21MC0012. The site form is based on examinations of photographs, which appear to contain Prairie Archaic style projectile points. Within the Prairie Lake Region, one site is well dated to the Prairie Archaic Tradition in Yellow Medicine County, 21YM47. Based on these sites and other Archaic sites identified throughout Minnesota, Archaic peoples developed techniques for making ground and pecked-stone implements, in addition to the chipped-stone tools of the previous area. They also began to fashion woodworking tools such as axes and gouges using basalt and granite as raw materials and make tools of copper, which indicates a substantive change in technology (Johnson, 1988; Fagan, 1991). Intensive bison hunting was the dominate activity in the lives of those living out on the prairies (Anfinson 1997: 35).

WOODLAND TRADITION

It was once believed the transition from Archaic to Woodland Tradition was marked by the simultaneous appearance of the manufacture of pottery vessels, the construction of earthen mounds and the cultivation of domesticated plants of tropical origin. It is now known that these different traits moved into regions at different rates and were selectively accepted or rejected by societies as desired. It is these different traits that have helped to define the Woodland Tradition within the Prairie Lake Region, where it has been divide into three phases: Mountain Lake (3000 – 200 BC, Initial Woodland Fox Lake (200 – AD 700), and Terminal Woodland Lake Benton (AD 700 – 1200). Although none of the known archaeological sites can be affiliated with any of these phases, there does appear to be some similarities in regards to settlement patterns. Within McLeod County, four known archaeological sites that are affiliated with the Woodland Tradition are located on lakes or former lakebeds. One site is located on the banks of the South Fork of the Crow River. This corresponds with other Prairie Lake Region Woodland settlement patterns.

In general, the Woodland Tradition in Minnesota is characterized by the presence of side- and corner-notched projectile points of several varieties. Copper continued to be used for awls or piercing tools and ornaments, although the frequency of copper articles lessened. Scrapers, knives, drills, awls and punches of chipped stone persisted without great modification and the ground-stone woodworking implements continued. The most common of the ground stone tools was the grooved maul: a spherical stone, usually granite, about the size of softball, encircled by a shallow groove and hafted on a wooden handle, probably using rawhide. These pounding tools were undoubtedly multipurpose, but they probably were commonly used to pound dried meat and berries. Their higher frequency in prairie-zone sites, where bison is a staple food, indicates this as a food preparation use (Johnson 1988).

Within McLeod County, limited ceramics have been identified at known archaeological sites and within private collections. Most of the sherds are grit tempered, with cord-marked, (possibly) smoothed or an indistinct surface treatment. The sherds have been assigned an indeterminate Woodland affiliation. The identified ceramic typologies found in the surrounding counties suggest that McLeod County may be

located at the outward extent of various cultural groups. Meeker and Wright Counties to the north contain Kathio, Brainerd, and Onamia Phases, Carver County to the east contains St. Croix Stamped and possibly later Oneota, and Sibley to the south contains Lake Benton and Fox Lake. Fox Lake Phase is also found in Meeker County, suggesting that during the Initial Woodland, McLeod County may have been within the Fox Lake generalized location.

LATE PREHISTORIC PERIOD

By AD 900, the Upper Midwest was ripe for another cultural revolution. Similar to the presence of Fox Lake and Lake Benton Phases, another non-Woodland cultural complex is found in the region during the Late Prehistoric Period, the Plains Village and Mississippian/Oneota Traditions (AD 900 – 1650). An important driving force in this change is the appearance of intense maize cultivation which also coincided with larger village sites (Gibbon et al. 2002).

The Plains Village Tradition (AD 950 – 1200) is contemporary with some Late Woodland phases, although Plains Village had more permanent villages focused on maize cultivation (Arzigian 2008). The tradition appears to have been influenced by both Middle Missouri and Mississippian Traditions. Within the Prairie Lake Region, Cambria and Great Oasis complexes are found (Anfinson 1997: 89). Both complexes likely lived in semi-permanent villages, Great Oasis on the islands, peninsulas, and isthmuses of lakes in the Prairie Lake Region while Cambria is concentrated on terraces of the Minnesota River and its tributaries. Great Oasis and Cambria ceramics are grit tempered, globular vessels. Cambria sites are either large villages, small villages, small habitation sites, or are mortuary sites (Anfinson 1997). Both phases contain worked bone and shell artifacts. Great Oasis sites have not identified house structures, although the density of artifacts and number of storage/trash pits would suggest they have not yet been identified (Anfinson 1997).

The Mississippian/Oneota Tradition was influenced by some Middle Mississippian societies at Cahokia to the south. By AD 1000, two major Mississippian/Oneota Traditions occupation centers were established in Minnesota. One was located near the junction of the Cannon and Mississippi Rivers, north of Red Wing and the other was along the central and upper Minnesota River. The first center was adapted to the forests and tall-grass prairies of the east, the other to the timbered river bottoms and grasslands of the west (Johnson 1988: 24). The Oneota Tradition also encompasses the Blue Earth Phase. The Blue Earth Phase is a part of Northwest Iowa group continuity and is primarily found in south-central Minnesota (Anfinson 1997). The Blue Earth Phase ceramics tend to be shell tempered, globular shaped vessels. Bone, and rarely, shell artifacts have been identified.

Carver County to the east of McLeod has one site that exhibits Oneota affiliation. And nearby Kandiyohi County contained Blue Earth affiliation. Within McLeod County, two known archaeological sites are affiliated with the Plains Village Tradition (21MC0011 and 21MC0012) and one with the Oneota Tradition (21MC0002). The three sites are located overlooking a lake or lakebed, or on an island. No other sites with McLeod County exhibit Late Prehistoric affiliations.

HISTORIC CONTEXT

According to Anfinson (1997), no archaeological sites within the Prairie Lake Region have produced early French trade items. A French era trade bead, a blue square glass bead, has been reported for Alpha Site 21Mca. The SHPO archaeological database reports that site 21MC0001 is a contact era site, although there is no indication of the type of contact era artifacts on the site form. Within six miles of McLeod County, one site is reported to contain contact era artifacts, 21CRs, in Carver County. Undoubtedly, trade goods, ideas, and diseases from early Euroamerican explorers reached different populations within McLeod County and the Prairie Lake Region long before face-to-face interactions took place.

The arrival of Europeans in the east caused a domino effect of westward shifting populations. Nearly all of present-day Minnesota, including McLeod County, was home to Dakota prior to Euroamerican arrival (Westerman and White 2012: 37). The French first encountered the Dakota in the mid-seventeenth century, when they were reported to occupy land from central Minnesota out to the eastern Dakotas (Gibbon 2003:50). According to Gary Clayton Anderson (1997:2), the Dakota also extending into western Wisconsin during contact times. The Glencoe area was inhabited by bands of Wahpeton Dakota. They had camps along the banks of Buffalo Creek and in the woods near Koniska on the South Fork of the Crow River (McLeod County Historic Society 1979:23). Curtiss-Wedge (1917: 11) states that the Dakota preferred to keep the “big woods” for hunting excursions, they did not make many permanent villages or habitations within the forests. He later states that the “big woods” were only occupied on or near the Minnesota River (Curtiss-Wedge 1917:19).

The area that is now Minnesota was acquired by the United States in 1783 by the Treaty of Paris and in 1803 by the Louisiana Purchase and the first Euroamerican settlers into the area arrived by the 1830's. A series of treaties dealt with the land that would become McLeod County. The Treaty of 1825 at Prairie Du Chien in which the Dakota and the Ojibwa arranged a border between their territories, and the Treaty of 1837 in which the Dakota ceded to the United States their lands east of the Mississippi, secured the land that is now McLeod County as Dakota lands. There was very little westward development in Minnesota before the treaty (the Treaty of Mendota) in 1851 in which the Lower Sioux ceded all lands in Minnesota east of Lake Traverse and from the Sioux and Red Rivers to the Mississippi.

Primarily Euroamerican explorers, traders, trappers, and missionaries travelled west of the Mississippi prior to the Treaty of 1851. One missionary was T.S. Williamson who was working with the Dakotas in 1837 and heard stories of when the Dakotas came down from the area that is now Mille Lacs, having been driven out by the Ojibwa. They in turn drove out the Ioway and Cheyenne from the lower Minnesota Valley. As early as 1846 James Baird, a trader, trapper, hunter, and scout visited the area that is now Winsted Township in McLeod County. He was later a part of the team in 1855 selected to help blaze a trail through the Big Woods to build a settlement at Glencoe (Curtiss-Wedge 1917). Intensive Euroamerican settlement followed the signing of the Treaty of Traverse des Sioux (Lass 1998). The nearby Yellow Medicine Agency was established from this treaty. Fort Ridgely, constructed in 1853, was established just south in Nicollet County on the Minnesota River.

McLeod County was established in 1856 and was divided into 14 townships, 12 of which were taken from Carver County and two were taken from Sibley County. The county was named for the Honorable Martin McLeod, one of the original explorers who founded the Town of Glencoe, at the edge of the Big Woods and the banks of Buffalo Creek, in May of 1855. The group of explorers also included Colonel John H. Stevens, A.J. Bell, James H. Mayhall, W.S. Chapman, and the Honorable Robert Vinton (Alden, Ogle & Company 1888; McLeod County Historical Society 1979).

Early settlers recognized that:

“The dense curtain of the ‘Big Woods’ hid from the view of the early settlers of the eastern portion of the State the paradise of wooded plain and grassy prairie that lay hidden behind it.” (Alden, Ogle & Company 1888).

McLeod County’s first permanent Euroamerican settlement was in Glencoe in early summer 1855. The town developed very quickly, and in the fall of 1855 land was plowed in preparation for the spring, and the first post office was established. 1856 saw the first saw mill, the first blacksmith, and the arrival of the first minister, Reverend Henry Elliot a Methodist Episcopal minister. By the winter of 1858-1859 the first bank, the Exchange Bank, was established in Glencoe. Quickly following the establishment of Glencoe in the spring of 1855, another group of men established the town site of Hutchinson in November of that year. This town also developed quickly and the first log cabin was built in December. By May 1856 a passable road with bridges was built connecting Watertown in Winsted Township and Hutchinson. Another settlement developed on the eastern shore of Lake Addie and is the site of the city of Brownston today. In 1856 it was known as Grimshaw’s Settlement and can be seen as such on the earliest maps. The winter of 1856-1857 was severe and travel between the Lake Addie settlement and Glencoe was impossible (Curtiss-Wedge 1917). By 1865 it was the only trading center west of Glencoe. The early pioneers would choose locations to settle where there were trees that could be used for fuel and shelter. The further south west portion of McLeod County, specifically Collins Township, was left open and it was common to see Native American hunting parties there. By 1863, however home seekers starting coming through in wagon trains pulled by oxen and horses to settle the prairie (McLeod County Historical Society 1979). There are eight Alpha Sites that are reported to being the location of ghost towns or abandoned villages established in the mid- to the late-1800s.

Many early accounts from Euroamerican settlers discuss visits from the Dakota Indians. Chief Shakopee, of the Mdewakanton Sioux was a frequent visitor to the county. Mrs. Margaret A. Snider who lived in Glencoe in 1856 tells of a friendly visit by 12 of Chief Shakopee’s people to her house. The Dakota were also known to be camped along Buffalo Creek near Koniska or on the Crow River north of Hutchinson during the fall and winter hunting seasons. They were said to be of a “kindly disposition” and would trade with the settlers (Curtiss-Wedge 1917). The Cheyenne would also visit the “Big Woods” on hunting and trapping excursions. The Ojibwa would seldom pass through and only for expeditions against the Dakota. One such incident left two dead and they were buried on the south bank of the Crow River, east of St. George. The early settlers referred to the mound as “the old Indian grave” (Curtiss-Wedge 1917). The exact locations of these activities remain unknown.

It was thought that the so-called “Mound Builders” did not have a strong presence (Curtiss-Wedge 1917). However, a geological surveyor in 1879 recorded a group of 15-20 “artificial mounds” on the northeast side of Lake Brewster in the south of section 29 in Glencoe (same purported location as newly identified 21MC0014 and 21MC0015), another similar grouping of mounds in the south east part of section 34 north of Hutchinson covering about ten acres or more, and 30 or more mounds in the north east of section 33 and the west half of section 34 in Helen Township (Curtiss-Wedge 1917). The exact locations of these activities remain unknown.

In 1855, the town of Glencoe was established and named the county seat. That same year, the town of Hutchinson was settled. The economic Panic of 1857 slowed development within McLeod County. In 1858 mail started to be delivered in Glencoe three times a week. It was carried by stagecoach, branching off the main line at Blakely on its way to Belle Plaine. The stagecoach would stop at Glencoe for fresh horses and continue on to New Ulm and Fort Ridgely.

Although major battles related to the U.S.-Dakota War of 1862 did not take place within McLeod County, skirmishes did, particularly in the Cities of Hutchinson and Glencoe (Alden, Ogle & Company 1888). Stockades were constructed in the Cities of Hutchinson, Glencoe, and Brownton. Little Crow, who was considered by many to be the Dakota leader in the U.S.-Dakota War of 1862, was killed approximately six miles north of Hutchinson in Meeker County. His mutilated body was brought back to the City of Hutchinson where it was further defiled.

The growth and population of McLeod County slowed through the 1860s. The railroad, Hastings & Dakota Railroad Co., brought to the City of Glencoe in 1872, helped transform the small town into a viable economic community and increased its population. The railroad also led to the City of Hutchinson in 1886. By 1900 most of the roads and cart ways connecting the towns of McLeod County were already established (McLeod County Historical Society 1979).

METHODOLOGY

LITERATURE SEARCH

Background research was completed to identify archaeological and historical sites documented through 2012. This research included reviewing cultural resource reports, site forms, maps and other available information within the county. Early county histories were searched for reports of mounds and settlement activity. Information reviewed included those available at the MHS library and internet site, the Office of the State Archaeologist (OSA) and the State Historic Preservation Office (SHPO). SHPO and OSA archaeological site and survey files were search for records within the county. OSA burial files were also reviewed. Historic General Land Office (GLO) survey maps, Trygg maps and Plat maps were reviewed as well.

PRIVATE COLLECTIONS

To gain knowledge on the history of McLeod County and to learn of unrecorded sites, an ad was placed in the Hutchinson Leader Newspaper prior to the start of fieldwork. A local collector and enthusiast responded as did a local historian. An event to interview local collectors and review their collections was organized with the McLeod County Historical Society in July 2012. An announcement was placed in society's newsletter. Of the two collections brought to the event, neither from McLeod County. At the present time, no active collectors have donated their collections to the McLeod County Historical Society, which is one of the things that the current director is trying to change, through informative programs and various fundraising events. Most of the collectors, while willing to mention to the director of the historical society that they were collectors, were unwilling to discuss their collections with professional archaeologists.

FIELD SURVEY

A total of 230 landowners were contacted requesting permission to survey their property. Properties containing archaeological sites that meet any of the following conditions were omitted from this right-of-entry request: site is otherwise publicly accessible, alpha site is historic in nature, or site has been visited by a professional archaeologist recently. Owners of 19 sites and alpha sites were contacted.

Criteria for contacting other landowners and selecting property for survey were threefold. First, we identified several localities that, based on USGS topographic maps appeared to feature the topography and water resources that may attract people into the area. Second, we wished to capture a broad geographical range that would provide meaningful coverage of the entire county by requesting access to parcels in each township. Finally, we sought a range of landforms that also included general upland to provide a sample of potentially high, medium and low probability areas. Of the 230 landowners that were contacted, 56 allowed access (24.3%), 10 denied access (4.3%), and 164 elicited no response (71.3%).

Pedestrian survey was conducted using 15-meter interval transects on areas of tilled agricultural fields. When an artifact was located, additional transects were walked at a 5-meter interval within 30 meters of the find spot. The surveys were conducted from the end of March to the end of June 2012, with the majority of the survey completed during the month of April. Photographs were taken depicting surface exposure, items of interest and overall views of the area. Field notes and sketch maps of the area were completed as part of this review.

Site re-visits were conducted at previously known sites, primarily those sites that have not been visited by a professional archaeologist within the past ten years. A total of seven previously recorded sites were

revisited. Sites that were not revisited included, sites that according to the *SHPO Manual for Archaeological Projects in Minnesota* (Anfinson 2005) had been revisited within the last ten years by a professional archaeologist. Other sites were on private land with no viable access road onto the property, such as with Site 21MC0011, which was on an island in the middle of Cedar Lake. For other sites landowner permission had been denied such as in the case of Alpha Site 21MCm, which was a gravel pit where human remains were reportedly found several years before the 1990 County State Aid Highway (CSAH) 9 Survey took place. In this instance, the landowner cited the fact they didn't want anyone in the gravel pit due to insurance reasons.

LOCATIONAL MODEL

Several iterations of a predictive model were generated using a Geographic Information System (GIS) environment. The purposes of the predictive model are 1) to provide a visual representation of some of the information in Table 1 for quick reference and 2) to provide a baseline for this and future characterizations of archaeology in the county. With the development of such a model, further statistical measures can be performed and any narrative predictive model can be properly evaluated and refined. Following the generation of the data below, an iterative process to score and refine the variables in the predictive model continued with feedback from the field survey.

The preliminary model was a simple, narrative model that primarily referenced USGS maps for geographical features that appeared likely to attract people to the area. This was done both intuitively and based on location of previously identified sites. Table 1 includes a list of geographical features of sites or portions of sites. The features listed there are not intended to be exhaustive or mutually exclusive.

It is clear by reviewing the table that previously identified sites are all located on elevated land within 150 meters of water. It is also apparent that these sites are predominantly located near the east to southeast shores of water features. Habitation sites in particular appear likely to be situated upon lake peninsulas.

With the distance to water variable's clear significance, the first modeling activity that is necessary for an accurate portrayal of archaeology probability is mapping historic water resources. Following generation of this dataset, we are able to account for locations that historically would have been adjacent to water, and therefore, should be assigned a higher probability value. We can also mask off areas that would have been historically too wet for intensive use, and therefore, should be assigned a lower probability value.

Lakes data provided by MNDNR were of course used for present water bodies. Several variables and datasets were used to derive the historical lakes and wet areas data. Hydric soil ratings and the presence of ponded, relict lakebed or drained attributes were used as a surrogate variable for the identification of former wetlands and wet areas that have been drained for agricultural improvement. We follow Donnelly's (2001) method of combining hydric soil classification with NWI wetlands and Restorable Wetlands (RWI) data which allows for mapping areas that would have been inundated frequently enough in the past to form hydric soils. A map unit was deemed hydric if it consists of at least 70% hydric components, thus ensuring that wet soils in high locations are included along with those in low lying wet areas (Donnelly 2001).

The resultant raster layer correlates well to historic USGS GNIS drained lakebeds and visual evidence found on 1930s –1950's air photos. This layer serves as a historic/existing water resource layer representing areas that are assumed to be not conducive for intensive activity.

The second attribute that is common to all previously identified sites is an elevated topographic position. To isolate elevated landforms, the method established by Jenness (2006) to calculate the Topographic

Position Index (TPI) proved to be very efficient. TPI enables the classification of a digital elevation model (DEM) into landform categories. TPI calculates the difference between the elevation of each raster cell and the average elevation of surrounding cells within a user-defined neighborhood. This method has been used effectively to delineate relatively high flat areas for landscape research (Jenness 2006). In this study, the model made available by Jenness (2006) was used to calculate the TPI.

Table 1 – Previously Identified Site Landforms

Site Number	Peninsula/ island in water feature	River terrace	Elevated topographic position	Within 150m of water feature	East/southeast side of water feature (inc. island)	Concentration /junction of large water features w/n 250m	General upland
21MC0001*	X		X	X	X		
21MC0002*	X		X	X	X		
21MC0003	X		X	X			
21MC0004			X	X	X	X	
21MC0005			X	X			
21MC0006			X	X	X		
21MC0007		X	X	X	X		
21MC0008			X	X	X	X	
21MC0009			X	X			
21MC0010		X	X	X	X		
21MC0011	X		X	X	X		
21MC0012*	X	X	X	X	X	X	
21MC0013			X	X			

* Denotes Known Habitation Site

A 10-meter DEM was used for the TPI calculations. After several iterations that experimented with different neighborhood settings as recommended by Jenness (2006), a 250-meter radius was selected as the neighborhood distance. TPI also enables the classification of a DEM into landform categories. After calculating the index for the entire county the cells were reclassified into three classes using the standard deviation method employed and recommended by Jenness (2006). Since the county’s glacial till surface is generally undulating, the cells within ± 0.5 standard deviations were considered as the flat slope areas and the areas greater than or equal to 0.5 standard deviation was considered as the high flat surfaces. All the areas less than – 0.5 standard deviation was considered as valleys and lower slope (Sermin and Jenness 2008).

Hobbs *et al.* (2002) found that 96% of 1,874 modeled archaeological sites are found on slopes of 10 degrees or less, thus any slopes greater than 10 degrees are considered steep. The scheme used by Hobbs *et al.* (2002) was used in this analysis as well. A three-meter DEM was used to calculate slope. The resultant raster was used to mask off steep slopes that are unlikely to contain archaeological sites.

With the data layers above created, the scoring and classification of areas proceeded relatively simply with the cell values scored as follows:

Distance to historic and existing water resources greater than 4 acres:

- Within 50 meters = value of 4
- Between 50 meters and 250 meters = value of 3
- Between 150 meters and 250 meters = value of 2
- Areas beyond 250 meters = value of 1

Topographic Position Index (TPI):

- Relatively high, flat areas = value of 3
- Areas of relatively average elevation = value of 1
- Valley bottoms and lower slopes = value of 0

Distance to multiple water features:

- Areas within 250 meters of more than one existing or drained water body = value of 1
 - Areas within 250 meters of a junction of a water body and a water course = value of 1
- Note: these values are additive*

Historic/existing water resource:

- Water resource covers cell = value of 0
- Water resource does not cover cell = value of 1

Steep Slopes:

- Cell has a steep slope = value of 0
- Cell does not have a steep slope = value of 1

The cell values of the resultant rasters were combined into one using the raster calculator function below:

$$([Distance\ to\ Water] + [TPI\ Class] + [Multiple\ Water\ Bodies] + [Junction\ of\ Water\ Bodies\ \&\ Courses]) * [Historic/Existing\ Water\ Resource] * [Steep\ Slope]$$

As the function indicates, cells that contain steep slopes and water features multiply their given value of 0 to any other value that has been added given the presence of any of the top three environmental conditions; in this way, the model masks off areas of steep slopes and water features to give such a cell a total value of 0. We note that while sites do exist within water bodies and on steep slopes (e.g. submerged canoes, projectile points that may have been lost, *etc.*), for the purpose of this general probability model, these types of sites are sporadic in nature and do not warrant assigning a higher probability to such areas. Cells values were then classified into four categories: High, Medium, Low and Lowest. Table 19 includes the classification the county’s percentage that is included in each class. Figure A-3 depicts these classes.

Raster Value	Class	Total Cells	Percent Coverage	Total Class Area	Total Class Percent
0	Lowest	40987301	28.2%	40987301	28.2%
1	Low	8192676	5.6%		
2	Low	24986514	17.2%		
3	Low	14320526	9.9%	47499716	32.7%
4	Medium	27708247	19.1%	42502008	29.2%
5	Medium	14793761	10.2%		
6	High	10414527	7.2%		
7	High	3320061	2.3%		
8	High	569726	0.4%		
9	High	49704	0.0%	14354018	9.9%
Total		145343043	100.0%	145343043	100.0%

RESULTS

PREVIOUSLY RECORDED SITES AND REVISITS

All previous site forms in the county were examined in order to determine what had previously been found. Confirmed sites that were given site numbers, but had not been revisited or had the site forms updated in the last ten years were physically checked. Alpha Sites were not revisited. All sites were revisited on March 15, 2012 by Alison Hruby.

Thirteen sites have previously been identified. The sites include Woodland, Plains Village, and Oneota components, with possible Plano and Archaic components. The sites were either on the shoreline or on a hilltop overlooking a lake, river or wetland. The first two sites inventoried, 21MC0001 and 21MC0002 are considered mounds and habitation sites. The other 11 sites are as artifact or lithic scatters. These include 21MC0003, 21MC0004, 21MC0005, 21MC0006, 21MC0007, 21MC0008, 21MC0009, 21MC0010, 21MC0011, 21MC0012 and 21MC0013. Below is a summary of what was found at each site.

Site #	Size (Acres)	Contexts	Site Type	Last Update
21MC0001	15.8	Woodland & Contact	Mounds/Artifact Scatter	1978
21MC0002	2	Woodland & Oneota	Mounds/Artifact Scatter	1975
21MC0003	1	Precontact	Lithic Scatter	1987
21MC0004*	0.8	Woodland	Artifact Scatter	1990
21MC0005*	0.8	Precontact	Lithic Scatter	1990
21MC0006*	2.5	Precontact	Lithic Scatter	1990
21MC0007*	1.3	Precontact	Lithic Scatter	1980
21MC0008	19.9	Precontact	Lithic Scatter	2006
21MC0009*	0.1	Precontact	Lithic Scatter	1996
21MC0010*	1.2	Woodland	Artifact Scatter	1997
21MC0011	5.2	Probable Plains Village	Lithic Scatter	1999
21MC0012*	120.7	Woodland & Plains Village, probable Archaic & Plano	Artifact Scatter	2001
21MC0013	0.1	Precontact	Lithic Scatter	2006

** Denotes Site Revisit in 2012*

Site 21MC0001: The site was originally recorded in 1944 as an earthwork and village site. Leonard Littfin farmed the 65 acres on the eastern shore of Winsted Lake and reported the site. All the mounds showed evidence of being “dug into.” The updated site form (1978) stated that there were two new houses in the area and no mounds were visible. The site is currently in residential land use with small areas in agricultural land use or fallow. The site was not revisited. Bolton & Menk is continuing to review collections housed at the McLeod County Historical Society and that of a local collector. An updated site form will be submitted upon completion of that research, anticipated in fall of 2013.

Site 21MC0002: This site, recorded in 1975, was located on a terrace approximately two meters above a drained lake (Red Lake). Two of the small hills in the area had been removed for gravel and the rest of the site area was under cultivation. This habitation site contained a surface collection with side and corner notched points, pottery and numerous flakes representing Woodland and Oneota occupations. Landowner permission was not granted and the site was inaccessible from the road, therefore the site was not revisited and no site form update was submitted.

Site 21MC0003: This site is located on the southwest side of Bullhead Lake, which was drained in the 1930s and is now a wetland. The site is four to six feet above the original lake shore and it was noted that the site had been disturbed. The surface collection consisted of two hammerstones and ten groundstone implements. The owner of the property, Gerald Harris also had additional artifacts that he collected, which included a maul and one projectile point. Landowner permission was not granted in time for a site revisit and a site form update was not submitted.



Site 21MC0004: This site is located just off County Road 61 on the north shore of Echo Lake and seven miles northeast of Hutchinson, Minnesota. The site was located on a small knoll that was currently under cultivation. A surface deposit consisted of flaked tools, cores, debitage, and undifferentiated Woodland body sherds.

Revisit

Landowner permission could not be attained, therefore, no walkover could be done. A DNR boat launch was located on an adjacent parcel to the west, so taking photographs was possible, in addition to examining the property through binocular. An update site form was completed

Signs around the edge of the property stated that the site had been turned into a conservation area. The land appeared to have been originally a field, but had been left fallow for numerous years judging by the thick grass covering the area. There was a small, dirt trail that ran parallel to the fence that the DNR had constructed as a property boundary between the private property and the boat launch. Three tree lines ran parallel to the fence to reinforce the boundary, two on the side of the site area and on the DNR side of the fence. The site appeared well protected due to the fact that plowing activity had ceased and the area had been allowed to return to its natural state since it was turned into a conservation area.

Site 21MC0005: Found on a rise above the Otter Creek bottomland that was under cultivation at the time, the site was identified in 1990. A surface collection was found to contain indeterminate, prehistoric lithic material, including chert debitage and a unifacial scraper.

Revisit

The site sits on a small rise just north of Lester Prairie. The site area was on private property and it was bisected by a long driveway that led to two recently built houses. The two homes were built on the east of the site in addition to a large garage. The rest of the site area appeared to be cultivated in hay or alfalfa. Permission was not granted, therefore the site condition remains unassessed. No walkover was possible.



Current development on 21MC0005, looking east

Site 21MC0006: Located on both sides of CSAH 9 and two miles north of Plato, Minnesota on a terrace above Buffalo Creek. Lithic debitage was discovered which included a siltstone biface. The site was recorded in 1990.

Revisit

This site was accessible from the road, therefore the site was revisited and an update site form was completed. The site originally extended to both sides of CSAH 9. The area to the west of the road was a small plot of deeply tilled farmland, that consisted of well sorted sand patches and silty loam, which ran downhill from north to south with the sloping landscape. There were numerous large rocks evident in the field, even though it appeared that no plowing had yet taken place on the parcel. The area further west was wooded and the trees surrounded a small, unnamed lake.

On the east side of CSAH 9 it was evident that the ditch area had been mowed the previous fall. Starting approximately 15 meters from the east edge of the road, sumac bushes and other vegetation began to encroach, but the area appeared relatively undisturbed. Even though a walkover was done across both site areas on each side of the road, no artifacts were observed.

Site 21MC0007: A lithic scatter was found on the shoreline of Otter Lake in what is now McDonalds Park in the City of Hutchinson. Items found were indeterminate flakes and debitage. The site was recorded in 1980.

Revisit

McDonalds Park Site is located on public property and a site update form was completed. The site is currently a restored native prairie area within park boundaries. There is a gravel walking path around half of the prairie. The area where the original site was located appears to flood on a regular basis and the area was very wet when visited. There appears to be a small channel between the park property and the private property located to the west. Within the channel, the water appears to drain to the north from Otter Lake. The area may have been originally wetland. No artifacts were observed.



McDonalds Park Site 21-MC-0007, looking north

Site 21MC0008: Recorded as a site update in 2006, this site was located on the southeast side of Belle Lake, approximately six miles northwest of Hutchinson. The site falls within the boundaries of Piepenburg County Park. A single artifact was listed as debitage/unidentified bone on the site form. The site was heavily disturbed due to the recreational nature of the site area. The site form was updated in 2006, therefore, it was not revisited.

Site 21MC0009: Recorded in 1996, this site, located in a field to the east of Trunk Highway (TH) 15 consisted of a lithic scatter of flaked stone tools and debitage from the Pre-Contact Period.

Revisit

Landowner permission was granted, therefore the site was revisited and an update site form was completed. The site was heavily vegetated. A few of the original shovel tests could still be seen. A line of old oak trees are located further to the east overlooking Buffalo Creek. While close to the right-of-way with telephone poles located overhead, there does not appear to be any other disturbance to the site. No artifacts were observed.

Site 21MC0010: The site was located on both sides of Trunk Highway 261, on two small knolls, on the south bank of the South Fork Crow River. Located on fallow ground and consisting of an artifact scatter, the site was recorded in 1997 and consisted of lithic debitage and grit tempered ceramics that included one indeterminate cord-marked ceramic rim sherd from the Woodland Period.

Revisit

Landowner permission was granted, therefore the site was revisited and an update site form was completed. The site area as a whole appears to be partially county ditch and as a result is mowed. The native grass is taller up on the actual hilltop areas. The east side of the road contains cattails in the ditch and a rock and brush dam that may indicate the area is very wet and that the water moves swiftly towards the Crow River to the north. Both sides of the road show little if any erosion. No evidence of previous shovel tests could be seen even though there was an excellent site map that accompanied the previous forms. No artifacts were observed.



Site 21-MC-0010, looking northeast

Site 21MC0011: Recorded in 1999, this site was described as containing a possible fire hearth or pit and lithic scatter, located in recreational woodland on an island in the middle of Cedar Lake. The site consisted of flaked stone tools, debitage and animal remains, along with fire cracked rock. Landowner permission was not granted and the site, being an island, was inaccessible therefore there was no site update.

Site 21MC0012: Listed as the Orville Rickert Site, this site is located on the east side of Lake Addie, north of Brownton, Minnesota. The site was recorded in 2001 and appears to be made from reviewing photos and not an actual field visit. It is an artifact scatter located in a cultivated area. The photos contained one possible precontact lanceolate point from the Paleo-Indian tradition, Archaic and Woodland point varieties, and one rat tail copper point. Ceramic sherds consisted of both smooth and corded surfaces, most appear to be grit tempered.

Revisit

Landowner permission was granted, therefore the site was revisited and an update site form was completed. The Orville Rickert Site is located on the northwest edge of the town of Brownton in what is now a large plowed field. The site is accessible at the end of 5th Street North in Brownton, however the last two blocks of the street were never paved and the streets are grass. Utilities however, are apparent along what would be considered the edge of the street or the right-of-way.

The site was deeply plowed and appeared to extend to the edge of the lake. The site area was too muddy at the time of the site visit for a walkover. No artifacts were visible from the edge of the field and it appeared that the site was plowed last fall. A stand of cottonwoods and river birch were observed on the western edge of the property, overlooking Lake Addie. When looking north by northwest there appears to be a large depression in the middle of the field. On air photos it is obvious that something bisects the current field in that particular area, however it appears to be too large to be from a drainage tile.

Site 21MC0013: Listed in 2006, this site is a lithic scatter, found on a grassland hilltop overlooking a wetland. The site consists of debitage from the Pre-Contact Period. The site is currently on private

property and is listed as the Schramm Farms. The site was revisited in 2006. Since the site has been revisited in the past ten years, no update was completed.

Alpha Sites

Additionally, 14 sites labeled “Alpha Sites” were identified. These sites consist of three lithic scatter sites (MCa, MCb, and MCo), two mound sites (MCc and MCn), eight sites listed as ghost towns or abandoned villages (MCd, MCe, MCf, MCg, MCh, MCI, MCj and Mck) and one site was located in a gravel pit where an interview stated that several years before the initial survey in 1990, human remains were found. Due to limited information on these site forms, no timeline can be established for any of the sites except the abandoned villages and ghost towns. Alpha Site 21MCc, was surveyed. Please see the Field Survey – Svoboda Parcel subsection for results of this survey.

PRIVATE COLLECTIONS

The various collections at the McLeod County Historical Society were reviewed to gain information regarding what had previously been found in the county in terms of archaeological and paleontological collections. There were several large collections from a few individuals that had been donated to the society. All of the individuals discussed in this section, who collected these artifacts are deceased. While the majority of the collection contained very little specific information as to where the artifacts were found, we are continuing to research at the McLeod County Historical Society for better information with the ultimate goal of identifying broad trends across the county. As a result of this ongoing work, we intend to provide updated site forms and information to OSA, as relevant.

Dr. J.H. Burns Collection

Dr. Jay Burns was a prominent dentist in Hutchinson from 1903 until his retirement in the early 1960s. He was an avid collector and many of the artifacts found in his collections were presumed to have come from McLeod County. He also received many artifacts as gifts from friends. He was an advocate for keeping “rare and valuable relics” in the county and he realized that artifacts could enhance historical society collections. Dr. Burns started collecting points when he was a boy in Oakfield, Wisconsin. In a newspaper article dated 1935, Dr. Burns stated that he “preferred to hunt for artifacts around Bear and Belle Lakes,” and this confirms what was written on some of his artifact in the Historical Society.

The majority of his 2,000 piece collection consists of sets of mounted and framed chert points, collected in the early 1900s. The majority of these points have no provenience associated with them and of those that are labeled most of them were not from McLeod County or Minnesota. The rest of the collection consists of grinding stones, projectile points (arrowhead and spearhead), game stones, hammerstones, celts, gorgets, axes, mauls, pestles, mortars, fossils and a mastodon tooth.

Upon building a new office in Hutchinson in the 1930s, Dr. Burns had a fireplace built in the basement in which he decorated the façade by encasing various artifacts from projectile points, to fossils, to pottery, axes, mauls and unique rocks he had found. No provenience is known for these artifacts.



Artifacts embedded in the fireplace of Dr. J.H. Burns

The current dentists that reside in this building are Dr. Steven Flinn and Dr. David Mach. The building is slated to be sold later this year after the current dental practice has moved to a larger office.

Littfin Family Collection

A memo, sent to McLeod County on August 13, 1944 stated that Leonard Littfin, 73, of Winsted, Minnesota owned the peninsula property on the east side of Winsted Lake. The site was given the number 21MC0001. This small peninsula juttred out into Winsted Lake and the Littfin farm was

reportedly located on several mounds and a “principal village site” that previously occupied the peninsula. Many of the low mounds had been dug into.

Mr. Littfin reportedly had an excellent collection of pottery from his farm. According to Wilford, it is of the Mille Lacs type. A dugout canoe was also found by Mr. Littfin that was on display at the Minneapolis library. According to a more recent article (Herald Journal: May 23, 2011), the dugout was donated to the state historical society.

The site form was updated in May 1978 and at that time the area where the Littfin Farm had been was platted and houses were being built on the property. Any mounds that had been located on the property were reported to have been destroyed. Stone axes, mauls, hammer stones, flakes, one large knife blade made from Knife River Flint and thirteen projectile points representing Late Archaic through Late Woodland types make up the current collection. No pottery sherds from Mr. Littfin’s collection were donated to the McLeod County Historical Society. In June 2013, the McLeod County Historical Society indicated that site 21MC0001 continues to be collected. Ongoing research and discussions with the director and a local collector of the site will continue. We anticipate submitting an updated site form including this information in fall of 2013.

Jack Knaff Collection

This is a small collection and not much was known about the owner, other than the fact that he was the barber in Hutchinson and he may have collected around the town. Artifacts included in this collection consist of axes, mauls and hammer stones that vary in size, shape and the material used to manufacture the artifacts.

S.S. Beach Collection

In 1935 Mr. Beach was named president of the McLeod County Historical Society. Under his direction, he established the first museum in the basement of the Hutchinson Library. Mr. Beach was also a farmer, school teacher, served on numerous boards throughout the town. Among his hobbies are listed history and geology.

While his main purpose for establishing the county historical society was to receive articles of historic interest and save them for prosperity, he also personally donated several items house in the prehistoric collection.

John Whisler Jr. Collection

One of the smaller collections at the McLeod County Historical Society, this collection consisted of several fossils, an animal claws, what appears to be a ceramic drawer pull, a quartzite flake and 11 pieces of prehistoric ceramic pottery of varying types. At least four pieces of pottery could be labeled as net impressed Brainerd Ware. There also appears to be one piece of horizontal cord-marked Fox Lake ceramic.

While it can be assumed that most of the artifacts in the collection at the McLeod County Historical Society were, in all probability, found in McLeod County, some of them as stated in the corresponding paperwork are not. Of the artifacts that can be assumed to have come from the county, they range from fossil material from 200 to 65 million years ago covering the Jurassic and the Cretaceous Periods.

The artifacts span the entire spectrum from the Eastern Archaic Tradition through the Mississippian Tradition. While the provenience information may not be accurate in most cases, the collection is a good example of when the county was inhabited and what activities the individuals took part in.

FIELD SURVEY

McLeod County encompasses approximately 505 square miles. Land use within the county is largely agricultural, providing ample opportunity for pedestrian survey. Field surveys were conducted in 11 of the 14 townships within McLeod County: Acoma, Hutchinson, Winsted, Lynn, Hassan Valley, Bergen, Collins, Sumter, Glencoe, Helen, and Penn.

As discussed in the Methods section of this report, each parcel was surveyed in 15 meter transects in a linear fashion, unless otherwise noted. When an artifact was located, additional transects were walked at a 5-meter interval. The total acreage for each parcel is listed in Table 4.

All properties with the exception of Schaefer Prairie were agricultural fields. Several owners of targeted properties permitted entry to conduct the survey on their property, but had recently converted their land to fallow with the assistance of the Conservation Reserve Enhancement Program (CREP). Agricultural fields had been plowed at least since last fall, if not more recently. In most cases the corn fields featured blocky peds.

Table 4 – Survey Results			
Parcel	Township	Acres Surveyed*	Identified Sites
Zetah	Acoma	21.7	
Piehl	Acoma	34.6	
Hahn	Acoma	61.5	
Boxelder Farm LLC	Acoma	69.7	
Prieve Farms LLC	Acoma	48.5	
Svoboda	Hutchinson	37	21MC0016 (21MCc), 21MC0017, 21MC0018, 21MC0019, 21MC0020
Klinghagen	Hutchinson	1.4	
Otto	Winsted	55.1	21MC0024, 21MC0025, 21MC0026, 21MC0027, 21MC0028
Piehl	Lyon	17.2	
Trettin	Lyon	100.3	
Duesterhoeft	Lyon	132.5	21MC0021
Reiner	Hassan Valley	95.9	
Algino	Bergen	7.4	
Schramm	Bergen	105	
Griebie	Collins	98.1	
Swift	Sumter	111.9	
K Tongen	Sumter	87.3	
A Tongen	Sumter	42.5	
Summerdorf	Sumter	74.9	
Griebie	Sumter	66.9	21MC0029
Nature Conservancy (Schaefer Prairie)	Sumter	50.3	
Brinkmann	Glencoe	16.6	21MC0014, 21MC0015
Mosey	Glencoe	7.8	21MC0014
Franke	Helen	54.7	
Mackenthun	Helen	59.6	
Paehlke	Penn	109.1	21MC0023
Harbarth	Penn	47.6	21MC0022
		Total: 1615.1*	

*Acreage is deemed to be a reliable estimate of the total area walked and excludes areas that were unsurveyable (e.g. wetlands, homesteads, forests, and etc.)

ACOMA TOWNSHIP

Acoma Township is one of four townships within McLeod County that has not been extensively drained after the arrival of Europeans. It still contains multiple lakes and wetlands. The South Fork of the Crow River also crosses through the southeast corner of the township. The township experiences great growth due to its close proximity to the City of Hutchinson and its lakes and varied landscape (County Planning Commission 1995: 8). Five property owners participated within Acoma Township: Zetah, Piehl, Hahn, Boxelder Farm LLC, and Prieve Farms LLC. No archaeological sites were identified within this township.

ZETAH PARCEL

The Zetah parcel is located in the northeastern portion of Acoma Township. The parcel is an agricultural field that is characterized by gently rolling hills, a significant portion of the southern and west-central portions contain wetland environments. The land slopes gently towards the wetlands along the southern boundary. This parcel was identified due to its close proximity to multiple smaller lakes and wetlands within the township. At the time of the survey the parcel had not been tilled since the previous fall. Personal communication with the present owner, Dennis Zetah on April 3, 2012, indicated that the parcel will no longer be farmed; it will be returned to prairie grasses. No cultural material was observed. See Appendix B: Figure 1 for a map of the survey area.

PIEHL PARCEL

Located along the banks of the South Fork of the Crow River, this landform has a few rises set back from the terrace edge. This parcel was not surveyed in entirety; a 50 meter portion was surveyed along the terrace edge and within a 50 meter boundary of the wetland found in the southwestern portion. This parcel was identified due to its location on the banks of the South Fork of the Crow River. At the time of the survey the parcel was an agricultural field. No cultural material was observed. See Appendix B: Figure 2 for a map of the survey area.

HAHN PARCEL

A corner of this parcel is adjacent to the South Fork of the Crow River. A wide, flat ridgeline ran north south near the western boundary. This parcel was chosen due to its proximity to the South Fork of the Crow River and its relatively hilly terrain. At the time of the survey the parcel was a tilled agricultural field. This parcel was not surveyed in entirety. Transects concentrated in the western and southern halves of the parcel. No cultural material was observed. See Appendix B: Figure 2 for a map of the survey area.

BOXELDER FARM LLC PARCEL

This parcel is located northwest of the Otter Lake/Campbell Lake reservoir. The parcel contained many small wetlands interspersed between ridgelines and hill tops. This parcel was identified due to its close proximity to the South Fork of the Crow River. At the time of the survey the parcel was a tilled agricultural field. No cultural material was observed. See Appendix B: Figure 3 for a map of the survey area.

PRIEVE FARMS LLC PARCEL

This parcel is located northwest of the Otter Lake/Campbell Lake reservoir. The parcel sloped significantly to the southwest in the western half. There was a small wetland along the northern parcel boundary. This parcel was identified due to its close proximity to the South Fork of the Crow River. At the time of the survey the parcel was a tilled agricultural field. No cultural material was observed. See Appendix B: Figure 3 for a map of the survey area.



Boxelder Farm LLC parcel, looking southwest



Piehl parcel, looking south

HUTCHINSON TOWNSHIP

Hutchinson Township is one of four townships within McLeod County that has not been extensively drained after the arrival of Europeans. It still contains a cluster of lakes and wetlands in the northern half of the township. Few small streams and wetlands are found in the southern half. The township experiences great growth due to its close proximity to the City of Hutchinson and its lakes and varied landscape (County Planning Commission 1995: 8). Two property owners participated within Hutchinson Township: Svoboda and Klinghagen. Five archaeological sites were identified within this township.

KLINGHAGEN PARCEL

The Klinghagen parcel is directly north of the Svoboda parcel. The terrain is a continuation of the ridgeline found on the Svoboda's parcel. The eastern half of the parcel is a wetland which is adjacent to the Lake. Another Lake is found along the western parcel boundary. This parcel was chosen due to its close proximity to an Alpha Site, 21MCc, its close relationship with nearby lakes, and the hilly terrain. A thin tract of land was recently tilled along the parcel boundaries, allowing for ground surface visibility. The ground surface of the remainder of the parcel is obscured by prairie grasses and home and yard construction. No cultural material was observed. See Appendix B: Figure 4 for a map of the survey area.

SVOBODA PARCEL

The Svoboda parcel is situated within an area of dramatic topographic relief along the northern boundary of the county. A cluster of lakes and wetlands is dispersed about the hills. The parcel straddles a high ridgeline, overlooking the Lake to the northwest, another Lake and a wetland to the northeast, and a third Lake and another wetland to the south. A smaller, low-lying portion of land is located in the southwest corner of the parcel between the Lake and a wetland.

Alpha Site 21MCc, which was reported to MHS by the present landowner in 1981. The Svobodas purchased the land in 1973, from a man who lived on the parcel nearly his whole life. Numerous arrowheads were found and some small burial mounds were reportedly present during the boyhood of the previous owner. Just prior to the purchase by the Svobodas, the previous landowner auctioned a personal collection of artifacts reportedly gathered from the property. A trade post is reported to have been located where the current residence was built (Frank and Joan Svoboda, personal communication, 2012).

Currently, a long winding driveway leads to the center of the parcel, on the top of the ridge, where the farmstead is located. The farmstead consists of a farmhouse, garage, barn, chicken coop, and an outbuilding, surrounded by grass and large, older trees. Agricultural fields surround the farmstead. The present pedestrian survey identified five archaeological sites on the Svoboda parcel, Svoboda 1, Svoboda 2, Svoboda 3, Svoboda 4, and Svoboda 5. At the time of the survey the parcel was a tilled agricultural field, with large blocky peds. A collector visited the parcel during the summer of 2011; artifacts were reportedly returned to the landowner, however, the only objects that were returned were clearly not artifacts. It is unknown if artifacts were collected from the property at that time. See Appendix B: Figure 4 for a map of the survey area.

Svoboda 1 Site

The largest site, Svoboda 1, consisted of 23 lithics and two square nails over 6.2 acres. This site overlaps the boundaries of 21MCc. It is located on top of and on the down slopes of the ridgeline in the north-central portion of the parcel. The site consisted of Find Spots (FS) 03, 04, 05, 06, 08, 09, and 20. The lithic material consisted of unidentified chert (n=9, 39.1%), Prairie du Chien Chert (n=8, 34.8%), quartz (n=3, 13.0%), Swan River Chert (n=2, 8.7%), and Jasper Taconite (n=1, 4.3%). There were 17 tertiary flakes, 2 secondary flakes, and 2 shatter fragments identified. One retouch flake and one small projectile

point tip, each of Prairie du Chien Chert. See table below for artifact summary. The Svoboda 1 site was assigned Minnesota Archaeological Site No. 21MC0016. See site form 21MC0016 in Appendix C.

Table 5 – Svoboda 1 Artifacts			
	Object	Material	Notes
FS-03a	Tertiary flake	Prairie du Chien Chert	Distal fragment
FS-03b	Tertiary flake	Chert	Proximal fragment
FS-03c	Tertiary flake	Chert	Proximal fragment
FS-03d	Tertiary flake	Chert	
FS-03e	Tertiary flake	Chert	
FS-03f	Tertiary flake	Chert	
FS-04a	Secondary flake	Jasper Taconite	
FS-04b	Tertiary flake	Prairie du Chien Chert	
FS-04c	Shatter	Chert	
FS-05a	Shatter	Swan River Chert	
FS-05b	Tertiary flake	Chert	
FS-05c	Secondary flake	Prairie du Chien Chert	
FS-05d	Tertiary flake	Prairie du Chien Chert	
FS-05e	Tertiary flake	Quartz	
FS-05f	Tertiary flake	Quartz	
FS-06a	Projectile Point	Prairie du Chien Chert	Tip fragment
FS-06b	Tertiary flake	Chert	Proximal fragment
FS-06c	Microdebitage: retouch flake	Prairie du Chien Chert	Proximal fragment
FS-08	Tertiary flake	Prairie du Chien Chert	Proximal fragment
FS-09a	Square nail	Metal	
FS-09b	Square nail	Metal	
FS-09c	Tertiary flake	Chert	Medial fragment
FS-09d	Tertiary flake	Prairie du Chien Chert	
FS-09e	Tertiary flake	Quartz	
FS-20	Tertiary flake	Swan River Chert	



Svoboda 1 site overview, looking west towards the Lake



Svoboda 1 site overview, looking east

Svoboda 2 Site

An isolated surface find, Svoboda 2, was identified in the far northeast corner of the parcel. The landform on the parcel slopes to a low-lying projection of land that extends into wetlands that border the Lake. The open water of the Lake is found approximately 100 meters northeast of Svoboda 2. The site consisted of FS-07. See table below for artifact summary. The Svoboda 2 site was assigned Minnesota Archaeological Site No. 21MC0017. See site form 21MC0017 in Appendix C.



Svoboda 2 site in center of picture, looking northwest

Table 6 – Svoboda 2 Artifacts			
	Object	Material	Notes
FS-07	Tertiary flake	Chert	

Svoboda 3 Site

The Svoboda 3 site contained two tertiary flakes observed on an easterly facing slope. A wetland is found at the bottom of the slope, approximately 1/8 mile to the west. See table below for artifact summary. The Svoboda 3 site was assigned Minnesota Archaeological Site No. 21MC0018. See site form 21MC0018 in Appendix C.



Svoboda 3 site in center of picture, looking northeast

Table 7 – Svoboda 3 Artifacts			
	Object	Material	Notes
FS-10	Tertiary flake	Chert	Banded gray chert
FS-11	Tertiary flake	Swan River Chert	

Svoboda 4 Site

Site Svoboda 4 was identified in the small field in the southwestern corner of the parcel. The landform is a low lying terrace between a wetland to the east and the Lake to the west. See table below for artifact summary. The Svoboda 4 site was assigned Minnesota Archaeological Site No. 21MC0019. See site form 21MC0019 in Appendix C.



Svoboda 4 site overview, looking east

Table 8 – Svoboda 4 Artifacts			
	Object	Material	Notes
FS-13	Tertiary flake	Chert	

Svoboda 5 Site

Site Svoboda 5 was identified in the small field in the southwestern corner of the parcel, nearest the Lake. It was observed at the base of a slight rise, overlooking a wetland to the east and the Lake to the north. See table below for artifact summary. The Svoboda 5 site was assigned Minnesota Archaeological Site No. 21MC0020. See site form 21MC0020 in Appendix C.



Svoboda 5 site overview, looking north

Table 9 – Svoboda 5 Artifacts			
	Object	Material	Notes
FS-14	Secondary flake	Chert	
FS-15	Secondary flake	Prairie du Chien Chert	

WINSTED TOWNSHIP

Winsted Township is located in the northeastern corner of the county. It contains a few smaller sized lakes and multiple drainages and streams, much of the original wetlands and lakes have been drained. The township contains the City of Winsted which supported an increase in commercial and industrial development. Townships along the county’s eastern boundary also experience the greatest development due to their close proximity to the Twin Cities Metropolitan area. One property owner participated within the Township: Otto. Five archaeological sites were identified within this township.

OTTO PARCEL

This parcel has gently rolling hills south of the Lake and northwest of a drained lake and wetland. This parcel was identified due to its relation with an existing lake and a lakebed. The parcel also appeared to be relatively hilly with multiple areas of higher elevations. Five archaeological sites were identified on this parcel, Otto 1, Otto 2, Otto 3, Otto 4, and Otto 5. The sites are considered sparse lithic scatters, consisting of between one and three lithics. At the time of the survey the parcel was planted in corn, approximately one to two feet high. See Appendix B: Figure 5 for a map of the survey area.

Otto 1 Site

Otto 1 site was observed in the southeastern portion of the parcel, on a southeasterly facing down slope. This site overlooks the northern end of a wetland and drained lake bed. See table below for artifact summary. The Otto 1 site was assigned Minnesota Archaeological Site No. 21MC0024. See site form 21MC0024 in Appendix C.



Otto 1 site overview, looking south towards Lakebed

Table 10 – Otto 1 Artifacts			
	Object	Material	Notes
FS-21	Tertiary flake	Chalcedony	Distal fragment
FS-22	Secondary flake	Chert	

Otto 2 Site

The Otto 2 site was observed on a northwesterly facing slope, overlooking the southern end of the Lake. The site consists of three artifacts, two flakes and one shatter fragment. See table below for artifact summary. The Otto 2 site was assigned Minnesota Archaeological Site No. 21MC0025. See site form 21MC0025 in Appendix C.

	Object	Material	Notes
FS-23a	Secondary flake	Quartz	
FS-23b	Tertiary flake	Chert	Proximal fragment
FS-23c	Shatter	Chert	

Otto 3 Site

The Otto 3 site was observed on a north facing slope overlooking the southern end of the Lake. Otto 3 consisted of three artifacts, a projectile point fragment and two flakes, summarized in Table 8. The projectile point fragment appears to be unfinished and unidentifiable. The point measures 22.42 mm long and 15.18 mm at the widest point. See table below for artifact summary. The Otto 3 site was assigned Minnesota Archaeological Site No. 21MC0026. See site form 21MC0026 in Appendix C.



Svoboda 1 site overview, looking west towards the Lake



FS-24a

	Object	Material	Notes
FS-24a	Projectile point	Quartz	Tip fragment
FS-24b	Tertiary flake	Quartz	Proximal fragment
FS-24c	Tertiary flake	Quartz	

Otto 4 Site

The Otto 4 site is located on a hilltop overlooking the southern end of the Lake. The site consists of one flake. See table below for artifact summary. The Otto 4 site was assigned Minnesota Archaeological Site No. 21MC0027. See site form 21MC0027 in Appendix C.

Table 13 – Otto 4 Artifacts			
	Object	Material	Notes
FS-25	Tertiary flake	Chert	

Otto 5 Site

The Otto 5 site is located on a southwesterly facing down slope. It is within 800 feet of the Lake. The site consists of one core. See table below for artifact summary. The Otto 5 site was assigned Minnesota Archaeological Site No. 21MC0028. See site form 21MC0028 in Appendix C.

Table 14 – Otto 5 Artifacts			
	Object	Material	Notes
FS-26	Core	Chert	

LYNN TOWNSHIP

Lynn Township is one of four townships within McLeod County that has not been extensively drained after the arrival of Europeans. It still contains many low lying lakes and wetlands along the eastern and southern boundaries, with drainage channels and streams in the northwestern portion of the parcel. Although the township borders the City of Hutchinson, it is quite agricultural, partially limited in development potential due to the airport southeast of Hutchinson (County Planning Commission 1995: 8). The surveys in this township were focused on the upland areas found in the northwest portion. Four property owners participated in Lynn Township: Piehl, Trettin, Duestehoef, and Reiner. One archaeological site was identified within this township.

PIEHL PARCEL

This parcel is located along the banks of the South Fork of the Crow River and is relatively low lying. This parcel was identified due to its location on the banks of the South Fork of the Crow River. This parcel was not surveyed in entirety; a 60 meter portion was surveyed along the terrace edge of the banks of the South Fork of the Crow River. At the time of the survey this parcel was a tilled agricultural field. No cultural material was observed. See Appendix B: Figure 2 for a map of the survey area.

TRETTIN PARCEL

This parcel is an upland area, overlooking wetland environments to the east and south. No existing drainage channels or ditches cross the parcel, it appears natural drainages may have crossed in the southwest corner and another near the center of the parcel prior to agricultural activity. This parcel was identified as part of a general upland overlooking a low lying area with multiple natural drainages and wetlands. At the time of the survey the parcel was a tilled agricultural field. No cultural material was observed. See Appendix B: Figure 6 for a map of the survey area.



Trettin Parcel overview, looking west

DUESTERHOEFT PARCEL

The Duesterhoeft parcel is composed of four smaller individual parcels. A straightened drainage ditch crosses in the northern half. A road bisects the parcel. These four parcels were identified as part of a general upland overlooking a low lying area with multiple natural drainages and wetlands.

Duesterhoeft Site

One site, Duesterhoeft site, consists of a single projectile point (FS-16) of a grayish white chert. The point was observed on the surface in a general upland environment. The base is broken diagonally, exposing one shoulder and a possible corner. A small piece of the tip is also broken. The point may be Samantha-like; however, in the absence of a base, this is uncertain. It measures 33.07 mm long and 16.72 mm at the widest. See table below for artifact summary. See Appendix B: Figure 7 for a map of the survey area. The Duesterhoeft site was assigned Minnesota Archaeological Site No. 21MC0021. See site form 21MC0021 in Appendix C.



Duesterhoeft site overview,
looking east towards judicial ditch



FS-16

Table 15 – Duesterhoeft Artifacts			
	Object	Material	Notes
FS-16	Projectile point	Chert	Broken base and tip

HASSAN VALLEY

Hassan Valley Township is located southeast of the City of Hutchinson, bisected by the South Fork of the Crow River. The township contains a few judicial ditches, likely straightened creeks. Much of the original wetlands and lakes have been drained by early pioneers. Hassan Valley contains the City of Biscay and borders the City of Hutchinson. One property owner participated with Hassan Valley Township: Reiner. No archaeological sites were identified within this township.

REINER PARCEL

The Reiner parcel is located near McCuen Creek and the South Fork of the Crow River. The parcel consisted of gently rolling hills. It sloped to the south and southeast to McCuen Creek, a straightened tributary of the South Fork of the Crow River. This parcel was identified due to its proximity to a tributary to the South Fork of the Crow River. At the time of the survey the parcel was a tilled agricultural field. No cultural material was observed. See Appendix B: Figure 8 for a map of the survey area.



Reiner Parcel overview, looking east

BERGEN TOWNSHIP

Bergen Township is located along the eastern boundary of the county. It is bisected by many streams and creeks, notably the South Fork of the Crow River and Buffalo Creek, much of the original wetlands and lakes have been drained. The township contains the City of Lester Prairie in the northeastern corner. Townships along the county's eastern boundary experience the greatest development due to their close proximity to the Twin Cities Metropolitan area. Two property owners participated within Bergen Township: Algino and Schramm. No archaeological sites were identified within this township.

ALGINO PARCEL

The Algino parcel was a long, thin parcel. The parcel sloped to the center where it was bisected by the South Fork of the Crow River. This parcel was identified due to its close proximity to the South Fork of the Crow River. The parcel was recently disturbed in the southern portion by the construction of a new home. At the time of the survey the parcel was a tilled agricultural field. Pedestrian survey transects were only conducted south of the South Fork of the Crow River. No cultural material was observed. See Appendix B: Figure 9 for a map of the survey area.

SCHRAMM PARCEL

The Schramm parcel consisted of rolling hills with occasional steeper slopes. Wetland environments are found to the east of the parcel, where Buffalo Creek is located. This parcel was chosen due to its close proximity to Buffalo Creek and wetland resources, the historical Camden Road (Trygg 1964), and distinct topographic position. At the time of the survey the parcel was a tilled agricultural field. No cultural material was observed. See Appendix B: Figure 10 for a map of the survey area.



Algino Parcel overview, looking south



Schramm Parcel overview, looking south

COLLINS TOWNSHIP

Collins Township is located in the southwestern portion of the county. It contains a couple of lakes and smaller creeks. Buffalo Creek crosses the township in the southwestern corner, much of the original wetlands and lakes have been drained. The township contains the City of Brownton in the southwestern corner. It is primarily agricultural with any development attributed to agricultural buildings (County Planning Commission 1995: 10). One property owner participated within Collins Township: Griebie. No archaeological sites were identified within this township.

GRIEBIE PARCEL

The Griebie parcel was chosen due to its close proximity to Buffalo Creek and Lake Addie. The parcel was bordered to the north by groves of trees along the creek. The remainder of the parcel was an agricultural field, with wetlands along the eastern boundary and a thick grove of trees in the southeast from an abandoned homestead. The terrain was gentle slopes with slightly higher elevations in the southern half of the parcel. At the time of the survey the field had short soy plantings. The far eastern portion of the parcel is found within the Sumter Township. The survey identified one site, the Griebie site, within the Sumter Township. Please see next Sumter Township section for site information. See Appendix B: Figure 11 for a map of the survey area.

SUMTER TOWNSHIP

Sumter Township is located along the western boundary of the county. It contains three lakes: Eagle Lake, Lake Whitney, and Lake Marion. Buffalo Creek crosses the township, much of the original wetlands and lakes have been drained. The township contains the City of Stewart in the southwestern corner. It is primarily agricultural with limited development along Lake Marion (County Planning Commission 1995: 10). Six property owners participated within Sumter Township: Swift, K. Tongen, A. Tongen, Sommerdorf, Griebie, and the Nature Conservancy. One archaeological site was identified within this township.

SWIFT PARCEL

The Swift parcel contained gently rolling hills, sloping to a large wetland in the southeast and southwest corners. This parcel was identified due to its location between two tributaries to the South Fork of the Crow River. At the time of the survey the parcel was a tilled agricultural field. No cultural material was observed. See Appendix B: Figure 12 for a map of the survey area.

K. TONGEN PARCEL

The K. Tongen parcel was chosen due to its location on both sides of the banks of Buffalo Creek just east of the City of Brownnton. At the time of the survey the parcel was planted in corn, soy, and other agricultural products. The corn varied in height from approximately 1 foot to over 5 feet tall. The elevation of the land varied within the parcel. Overall, higher terraces and ridgelines were found further away from the creek banks. At the time of the survey Buffalo Creek had extended onto the agricultural field primarily on the south side of the creek. The parcel was not surveyed in entirety. The parcel was wooded along the north and south banks of the creek. No cultural material was observed. See Appendix B: Figure 13 for a map of the survey area.

A. TONGEN PARCEL

The A. Tongen parcel was chosen due to its location on both sides of the banks of Buffalo Creek just east of the City of Brownnton. At the time of the survey the parcel was planted in corn. The corn varied in height from approximately 1 foot to over 4 feet tall. In general, the elevation of the land was fairly flat, sloping to Buffalo Creek. At the time of the survey Buffalo Creek had extended onto the agricultural field primarily on the south side of the creek. The parcel was not surveyed in entirety. The parcel was wooded along the north and south banks of the creek. No cultural material was observed. See Appendix B: Figure 13 for a map of the survey area.

SOMMERDORF PARCEL

The Sommerdorf parcel is located on the banks of Buffalo Creek just east of the City of Brownnton. This parcel was chosen due its location to Buffalo Creek, a tributary, and a small lake. The parcel is bisected by Buffalo Creek and smaller tributaries, creating four separate fields. At the time of the survey the largest section of the parcel was planted in soy. A smaller section on the south side of Buffalo Creek was planted in corn, approximately 2 feet high. The remaining sections of field were either not in agriculture (no visibility) or were inaccessible due to the flooding of Buffalo Creek. The terrain was generally gently rolling hills, with down slopes to Buffalo Creek. The parcel was not surveyed in entirety. The parcel was wooded along the north and south banks of the creek. No cultural material was observed. See Appendix B: Figure 13 for a map of the survey area.



K. Tongen parcel overview, looking east



Sommerdorf parcel overview, looking northeast

GRIEBIE PARCEL

Please see previous section on Collins Township for parcel review. The far eastern portion of the Griebie parcel is found within the Sumter Township. This parcel was identified due to its location nearly surrounded by a Creek and its close proximity to a Lake. The survey identified one site, the Griebie site, within Sumter Township. See Appendix B: Figure 11 for a map of the survey area.

Griebie Site

The survey identified one edge modified lithic flake, located 30 meters north of the abandoned homestead. The site consisted of one artifact, a tertiary flake that unifacially edge modified. See table below for artifact summary. The Griebie site was assigned Minnesota Archaeological Site No. 21MC0029. See site form 21MC0029 in Appendix C.



Griebie site overview, looking east



FS-27

Table 16 – Griebie Artifacts			
	Object	Material	Notes
FS-27	Tertiary flake	Chert	Edge modified

SCHAEFER PRAIRIE PARCEL (THE NATURE CONSERVANCY)

Schaefer Prairie is a tallgrass prairie preserve located on the eastern banks of Buffalo Creek. The terrain gently slopes from a knoll on the eastern boundary towards the wetlands, rising again on the west to a gently rolling hill before down sloping to Buffalo Creek. The knoll on the eastern boundary is half on The Nature Conservancy land and half on an adjacent private parcel. The Prairie was purchased by The Nature Conservancy in 1967. Prior to 1967, the Prairie was mowed for hay; a portion in the southwest was in agriculture at that time. The parcel has never been under heavy constant agricultural practices. Currently, the Prairie has been restored to a tallgrass prairie preserve by removing invasive species. The preserve contains prairie and wetland plants, including nearly 250 Minnesota native plant species (www.nature.org/ourinitiatives/regions/northamerica/unitedstates/minnesota/placesweprotect/schaefer-prairie.xml). See Appendix B: Figure 14 for a map of the survey area.

Mound like features were observed at Schaefer Prairie. Surface visibility was limited due to the vegetation. A field visit was conducted to determine if these were actual burial mounds or non-cultural in nature and to take measurements of the features and to ascertain if there was a cultural component. The features were observed on the east side of the parcel, on a westerly facing gentle down slope of a knoll. The highest point of the knoll is now found at the location of Nature Avenue. The area is within and surrounded wetlands.

These features could have a variety of origins, including animal activity, water table fluctuations, wind, convective freeze-thaw activity, or seismic action. However, geomorphic processes tend to create organized mounds, with distinct directional trends (e.g. Lane and BassiriRad 2005; Howarth and Johnson 2006; Seifert et al. 2009; Wilkinson et al. 2009; Cramer et al. 2012).

The features at Schaefer Prairie were generally oval to round shaped. The dimensions of eight mounds were recorded, on average they were 7.3 meters north/south, 7.9 meters east/west, and 1.75 feet high. The smallest mound was 5.8 meters north/south and 6.6 meters east/west, the largest mound was 9.0 meters north/south and 9.4 meters east/west, both were 2 feet high. In many cases, there was a distinctive vegetation change between the vegetation found on the earthwork and the surrounding area. Since the ground surface was obscured by the vegetation, no cultural material was observed. A summary of the field observations can be found in Table 17.

Mound #	N-S (m)	E-W (m)	Height (ft)	Notes:
1	8.8	12.5	1.5	Round, distinctive change in vegetation although curly grass is also found in surrounding vegetation
2	5.8	6.6	2.0	Oval, relatively same vegetation, sparse curly grass
8	8.4	8.4	2	Round, distinctive vegetation change, feature has curly grass and small tree in center. Surrounding vegetation has woody stalks of dried flowers
9	4.0	7.8	1.5	Oval, no vegetation change from surrounding
12	8.2	7.8	2.5	Round, distinctive change in vegetation, mound has curly grass, surrounding s gray/brown
13	5.5	6.3	2.0	Round, feature has woody shrub vegetation, similar variety within 5 feet
19	9.0	9.4	1.5	Round, feature has distinctive stand of vegetation (tall hollow)
21	8.5	4.2	>1.0	Oval, distinctive change in vegetation, at edge of road

According to Finney (2010), mima mounds were once common throughout the Upper Midwest where the substratum was dense and/or experienced periodic to semi-permanent saturation. These environmental conditions prohibited the vertical burrowing of animals, primarily the pocket gopher, instead allowing horizontal burrowing activities that resulted in the mima mounds. Mima mounds generally range from 3 to 36 meters in diameter and 0.3 to 2 meters high (Finney 2010: 8). Finney also states that mima mounds are found in the “western states of Washington, Oregon, and California; the Rocky Mountains; the mid-lower Mississippi Basin; and Louisiana-Texas Gulf Coast” (Finney 2010:1). Schaefer Prairie is listed in Finney’s article as a known mima mound site. The reference used for Schaefer Prairie is an un-authored site guide produced by The Nature Conservancy. It is unknown what fieldwork to place to designate the Schaefer Prairie features as mima mounds.

Finney states that natural mounds “were opportunistically used for prehistoric interments, and later as ideation templates for prehistoric burial, effigy, and other mounds and utilitarian structures” (Finney 2010:1). Finney hypothesizes that the earthworks created by prehistoric populations are replicating the naturally occurring mima mounds. This hypothesis is not supported by the fact that culturally made earthworks are not found in all locations of naturally occurring mima mounds, such as the States of Washington, Oregon, and California, and the Rocky Mountains. His hypothesis also downplays the ingenuity of earthwork creations. According to conversations with Dr. Ronald Schirmer (personal communication 2012), an Associate Professor in Anthropology at Minnesota State University – Mankato, we may never fully understanding the reasons why a particular group created earthworks, why a particular location was chosen, why they appear to be in a particular pattern or are more random, why some contain burials and cultural material, and why some are void of cultural material.

The Nature Conservancy conducts periodic controlled burns to manage the prairie. Observations taken without the vegetative land cover should shed light on whether this location warrants designation as a site or alpha site.

Figure 18 – Schaefer Prairie and Buffalo Creek, on 1 Meter LiDAR Shaded Relief DEM

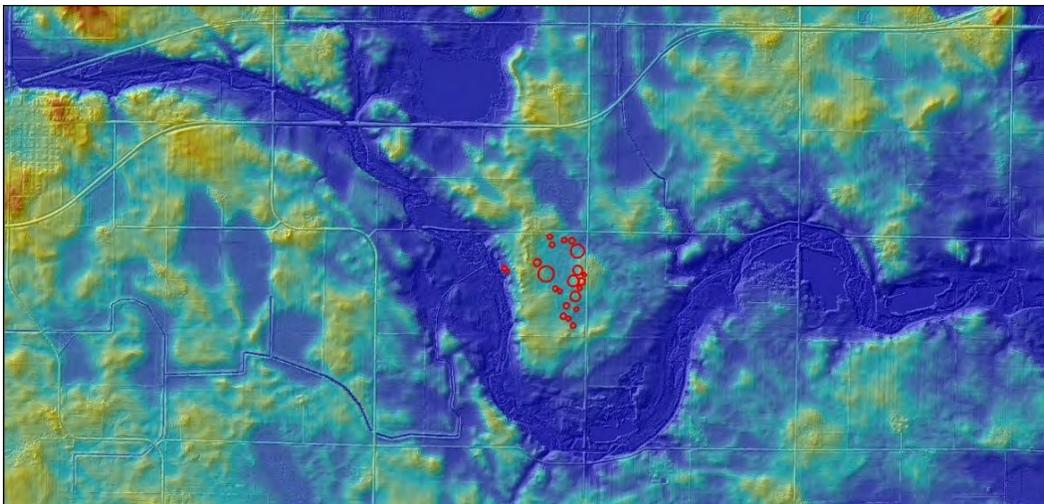


Figure 19 – Schaefer Prairie Mounds, on 1 Meter LiDAR Shaded Relief DEM

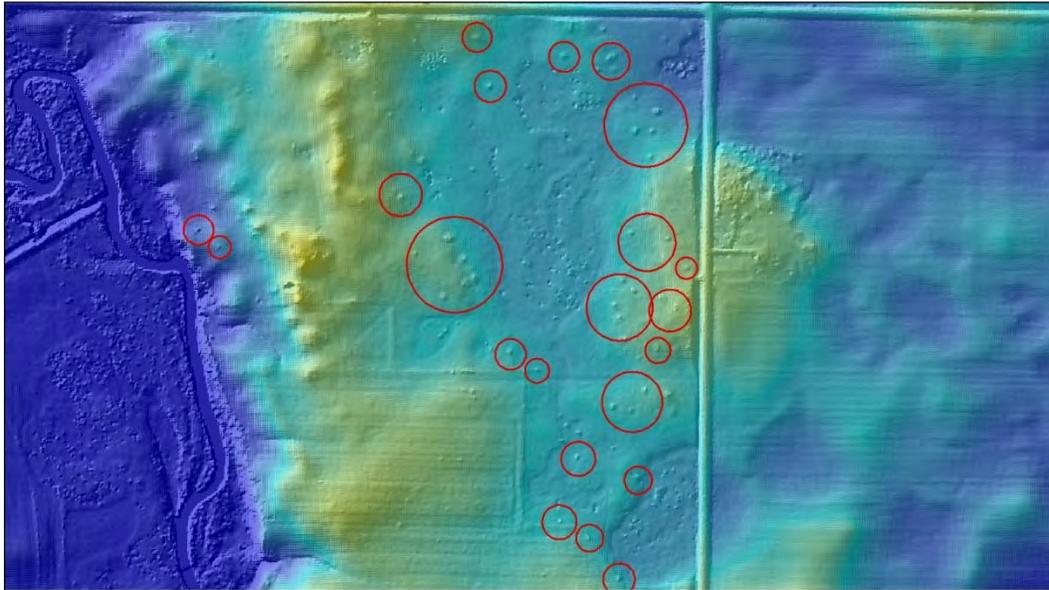
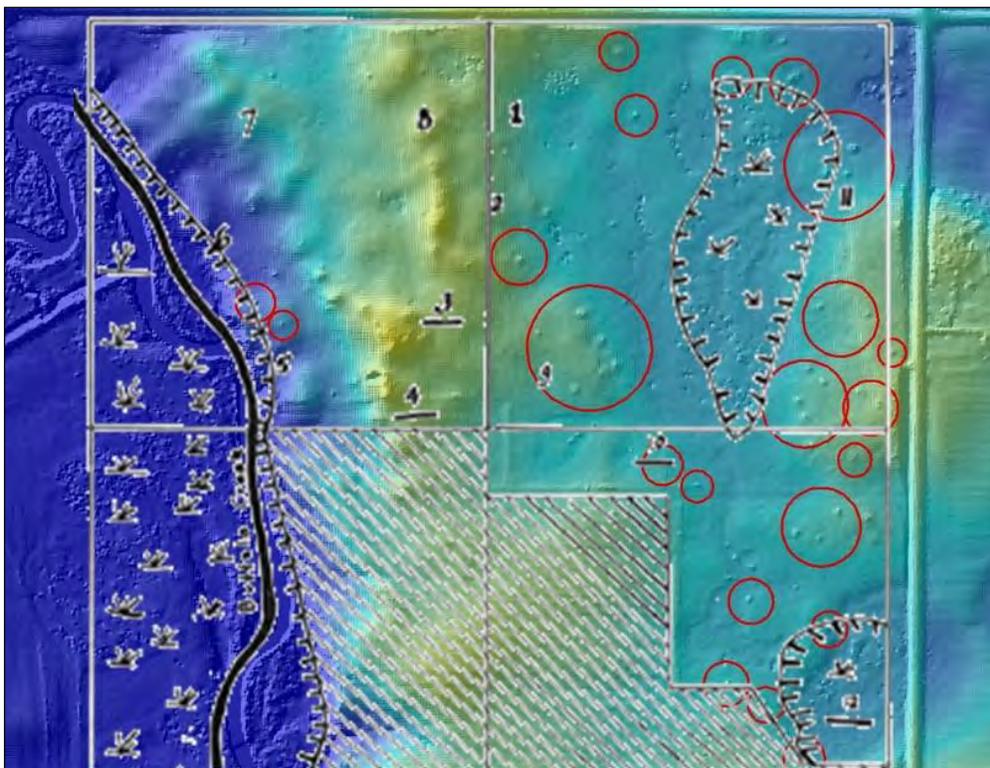


Figure 20 – Shaded Relief Overlaid by Map Depicting Unplowed Portion of Schaefer Prairie



Source: Johnson 1970

Note: The Wetland Area to the Northeast has been identified by the MNDNR as Wild Rice Pond.

GLENCOE TOWNSHIP

Glencoe Township is located in the southeastern portion of the county. It encompasses the City of Glencoe. Buffalo Creek and a few small drainage ditches cross the township, much of the original wetlands and lakes have been drained. Presently, no significant sized lakes exist within the Township. The township is primarily agricultural with limited development along Lake Marion (County Planning Commission 1995: 10). Two property owners participated within Sumter Township: Brinkmann and Mosey. Two archaeological sites were identified within this township.

BRINKMANN PARCEL

The Brinkmann parcel was chosen due to its location on the northeastern shore of a drained lake, Brewster Lakebed. The parcel is relatively flat, with slight slopes to the former lake. The parcel is currently an agricultural field. At the time of the survey, the parcel was tilled, with large blocky peds. Two sites were identified on the parcel, the Brinkmann site and the Brinkmann/Mosey site. See Appendix B: Figure 15 for a map of the survey area.

Brinkmann/Mosey Site

The Brinkmann/Mosey site consisted of three find spots; it is located on both the Brinkmann and the Mosey parcels. FS 1a is a small chert tertiary flake, FS 1b a quartz flake, and FS 1c is a quartz shatter fragment. FS 1a and FS1b were identified on the Brinkmann parcel, FS 1c was identified on the Mosey parcel. The site is located north of the drained Lakebed. See table below for artifact summary. The Brinkmann/Mosey site was assigned Minnesota Archaeological Site No. 21MC0014. See site form 21MC0014 in Appendix C.



Brinkmann/Mosey site overview, looking south

Table 18 – Brinkmann/Mosey Artifacts			
	Object	Material	Notes
FS-1a	Tertiary flake	Chert	
FS-1b	Tertiary flake	Quartz	
FS-1c	Tertiary flake	Quartz	

Brinkmann Site

The Brinkmann site contained three find spots. FS 2a a quartzite secondary flake, FS 2b a chert secondary flake, and FS 2c a quartz shatter. The Brinkmann site is located northeast of the drained Lakebed.

See table below for artifact summary. The Brinkmann site was assigned Minnesota Archaeological Site No. 21MC0015. See site form 21MC0015 in Appendix C.



Brinkmann site overview, looking southwest towards Brewster Lakebed

Table 19 – Brinkmann Artifacts			
	Object	Material	Notes
FS-2a	Secondary flake	Quartzite	
FS-2b	Secondary flake	Chert	
FS-2c	Shatter	Quartz	

MOSEY PARCEL

A small portion of the southeast corner of the Mosey parcel was surveyed. This parcel was chosen due to its close proximity to Brewster Lakebed, a drained lake. At the time of the survey, the parcel was tilled with large blocky peds. Surface visibility was excellent at 100%. A drained lake, is found in the southeast corner of the parcel. The parcel is currently an agricultural field. One archaeological site was identified north of the drained lake, the Brinkamnn/Mosey site, see Brinkmann/Mosey site discussion above. See Appendix B: Figure 15 for a map of the survey area.

HELEN TOWNSHIP

Helen Township is located in the southeastern corner of the county. It is immediately east of the City of Glencoe and encompasses the City of Plato. It contains the confluence of two smaller unnamed creeks (now judicial ditches) and Buffalo Creek. Additional small creeks are found throughout the township, much of the original wetlands and lakes have been drained. Presently, no significant sized lakes exist within the Township. Townships along the county's eastern boundary also experience the greatest development due to their close proximity to the Twin Cities Metropolitan area. Two property owners participated within Sumter Township: Franke and Mackenthun. No archaeological sites were identified within this township.

FRANKE PARCEL

The Franke parcel is bisected by one of the judicial ditches south of Buffalo Creek. This parcel was chosen due to its proximity to a tributary to Buffalo Creek. At the time of the survey the parcel was a tilled agricultural field with large blocky peds. No cultural material was observed. See Appendix B: Figure 16 for a map of the survey area.

MACKENTHUN PARCEL

The Mackenthun parcel is relatively low lying with a slight ridge running north-south. This parcel was chosen due to its proximity to a tributary to Buffalo Creek. At the time of the survey the parcel was a tilled agricultural field with large blocky peds. No cultural material was observed. See Appendix B: Figure 17 for a map of the survey area.



Franke parcel, looking southwest



Mackenthun parcel, looking northwest

PENN TOWNSHIP

Penn Township is located along the southern boundary of the county. It contains many lakes and streams, including a small portion of Buffalo Creek, much of the original wetlands and lakes have been drained. The township is completely rural in character; it has a strong agricultural base (County Planning Commission 1995: 7). Two property owners participated within Sumter Township: Paehlke and Harbarth. Two archaeological sites were identified within this township.

PAEHLKE PARCEL

The Paehlke parcel is located northwest of a Lake. A judicial ditch bisects the northeastern portion of the parcel. Remnants of the Big Woods are found on the edge of the Lake. A knoll was observed in the southwest corner of the parcel, nearest the Lake. This parcel was selected for survey due to its proximity to present and drained water resources and topographic position. According to the landowner, DuWayne Paehlke (personal communication, 2012), pre-contact artifacts had been found on the land and a village once stood on the knoll. Surface survey revealed a sparse scattering of modern household debris on the knoll. While the Paehlke farmstead is a Century Farm, owned by the same family for over 100 years, the property in the west half of the Section was previously owned by another family. Paehlke indicated that the grove of trees in that area has never been harvested, thinned, or cultivated, but that the portions that are farmed have been collected. Many projectile points that were once part of that collection were reportedly auctioned prior to DuWayne Paehlke’s purchase of that property (DuWayne Paehlke, personal communication, 2012). See Appendix B: Figure 18 for a map of the survey area.



FS-19

Paehlke Site

One projectile point made from heat-treated Tongue River Silica was observed on the parcel, east of the Big Woods. The point was observed on a relatively flat landscape, approximately 3/8 mile northeast of the Lake. The point is triangular shaped with excurvate sides. The point has side notches, the base is broken. The artifact is a Late Woodland side-notched point. The absence of a base makes a more specific classification uncertain. It measures 37.55 mm long and 23.55 mm at the widest. See table below for artifact summary. See Appendix B: Figure 18 for a map of the survey area. The Paehlke site was assigned Minnesota Archaeological Site No. 21MC0023. See site form 21MC0023 in Appendix C.

Table 20 – Paehlke Artifacts			
	Object	Material	Notes
FS-19	Projectile point	Tongue River Silica	Broken base

HARBARTH PARCEL

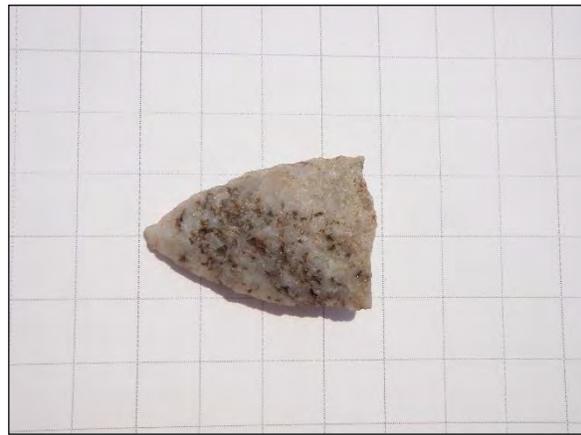
The Harbarth parcel is northeast of the Lake and a wetland, immediately south of the Paehlke parcel. A judicial ditch bisects the parcel. A knoll and slight ridgeline are found in the southwest corner of the parcel. This parcel was identified due to its location on the edge of a lake. See Appendix B: Figure 18 for a map of the survey area.

Harbarth Site

One projectile point made from Swan River Chert was observed in the southwest corner of the parcel. The point was observed on a gentle slope facing southwest towards a pond/wetland environment at the edge of a the Lake. The point is triangular shaped, has excurvate sides and a broken base. The type is indiscernible; however, the dimensions of the fragment suggest that it may be a larger dart point. It measures 37.15 mm long and 24.77 mm at the widest. See table below for artifact summary. See Appendix B: Figure 18 for a map of the survey area. The Harbarth site was assigned Minnesota Archaeological Site No. 21MC0022. See site form 21MC0022 in Appendix C.



Harbarth site overview, looking south



FS-17

Table 21 – Harbarth Artifacts			
	Object	Material	Notes
FS-17	Projectile point	Swan River Chert	Broken base

LOCATIONAL MODEL

We found a clear correlation between known and newly identified archeological sites and positions with high TPI values that occur near present and former large wetlands, lakes and watercourses. Our classification resulted in nearly 10% and 30% of the county being of high or medium probability, respectively. As indicated in Table 22, all but one of the multi-artifact sites is accounted for within these two classes. Overall, 82.2% of the sites’ areas fall within these classes. More complicated quantification of regional environmental and cultural variables may account for countywide distribution. These variables may include neighborhood density of water resources, suitable travel routes and others. The newly recorded sites and the probability model are depicted in Figure A-3.

Table 22 – Site Areas by Probability Class

Site Number	Percent Very Low	Percent Low	Percent Medium	Percent High
21MC0001	17.3	0.3	9.3	73.1
21MC0002	5.9	0.0	28.4	65.8
21MC0003	24.8	0.0	10.5	64.8
21MC0004	6.7	0.0	0.0	93.3
21MC0005	0.0	0.0	60.9	39.1
21MC0006	6.5	0.0	0.0	93.5
21MC0007*	100.0	0.0	0.0	0.0
21MC0008	23.3	0.4	15.6	60.8
21MC0009	100.0	0.0	0.0	0.0
21MC0010	12.1	0.3	8.4	79.1
21MC0011	33.7	0.0	17.6	48.8
21MC0012	15.8	3.4	16.6	64.3
21MC0013	0.0	0.0	0.0	100.0
21MC0014	92.9	0.0	7.1	0.0
21MC0015	0.0	0.0	100.0	0.0
21MC0016	0.0	0.0	0.0	100.0
21MC0017*	54.7	0.0	0.0	45.3
21MC0018	0.0	0.0	0.0	100.0
21MC0019*	0.0	0.0	100.0	0.0
21MC0020	12.6	0.0	63.1	24.3
21MC0021*	0.0	0.0	100.0	0.0
21MC0022*	0.0	0.0	0.0	100.0
21MC0023*	0.0	89.6	10.4	0.0
21MC0024	0.0	0.0	0.0	100.0
21MC0025	0.0	0.0	0.0	100.0
21MC0026	0.0	0.0	0.0	100.0
21MC0027*	0.0	0.0	0.0	100.0
21MC0028*	28.3	1.3	70.4	0.0
21MC0029*	0.0	0.0	1.8	98.2
Total	18.4	3.3	21.4	56.9

DISCUSSION

The survey targeted a broad variety of landforms and geographic locations throughout the county to test for possible sampling biases that may have existed in the previous identification of sites. Table 23 includes the landforms that are present at all recorded sites in McLeod County. Note that the elevated topographic position and distance to water variables remain clearly significant in determining where sites are located.

Two other variables that are common among archaeological sites in the county are their locations to the east/southeast of water features (including 1 island) and nearby concentrations of large water bodies or junctions of water bodies and water courses. These two variables are present for 15 and 11 sites, respectively.

Sites 21MC0001, 21MC0002 and 21MC0012 remain the only identified habitation sites in the county. Along with four other sites, these habitations are all located on peninsulas (one additional site was identified on an island). Site 21MC0012 is also located on a river terrace, an attribute that it shares with just two other sites. Note that we characterize 21MC0007 as being situated on a river terrace as opposed to a lake shore because Otter Lake is an artificial reservoir.

Given these attributes, it generally appears that sites tend to have a greater lakes focus than one on riverine resources. To some extent, the proportions of sites located on rivers and streams versus lakes may equalize as more sites are identified. Our survey, however, including many areas located along rivers and streams in the county and it seems unlikely that this phenomenon is due to a sampling bias.

Our survey also targeted general upland throughout the county. Of the 29 sites now known, none is found in the general upland.

Following the methods used for generating the county-wide probability model, ponded and hydric soils and existing wetlands are of the lowest probability for identifying sites. This historic/existing water resources layer covers 17.5% of the county. Historic/existing water resources and water table within the top 50 centimeters of the surface can be modelled by isolating Mollisols (Aquolls), Entisols (Aquents), Histosols, udorthents (most udorthent soils in McLeod County are quarries along streams and account for a minor proportion of the total area). The resultant high water table/historically standing water layer would cover 66.2% of the county. This supports the discussion in the Historical Drainage in McLeod County subsection of this report that the county was historically extremely wet. It is possible that this abundance of water had a prohibitive effect on habitation prior to the artificial, extensive drainage that took place since the 1880s.

The very low probability class includes 18.4% of site area. Many of the sites represented within the very low class are single artifacts. Sites 21MC0009 and 21MC0014 have all of or the vast majority of their areas within very low probability areas and are not single artifacts. As noted in Table 23, 21MC0009 is situated atop an elevated topographic position and 21MC0014 is within 150 meters of a water feature. We attribute this erroneous classification to a smoothing of the model that occurred through the use of soils data and TPI elevation data.

Hobbs and Nawrocki (2002) note, following Hasenstab (1991), that models accounting for distance to edge of water resources as opposed to distance to water resources may capture the probability of identifying submerged archaeological sites. A more refined model in the county could include this variable. Any elevated probability classification for areas within these water basins to account for

possibly submerged sites would need to be responsive to the data that seem to support the notion that these easily flooded areas were not archaeologically significant in the McLeod County.

Table 23 – Site Landforms

Site Number	Peninsula/ island in water feature	River terrace	Elevated topographic position	Within 150m of water feature	East/southeast side of water feature (inc. islands)	Concentration /junction of large water features w/n 250m	General upland
21MC0001*	X		X	X	X		
21MC0002*	X		X	X	X		
21MC0003	X		X	X			
21MC0004			X	X	X	X	
21MC0005			X	X			
21MC0006			X	X	X		
21MC0007		X	X	X	X		
21MC0008	X		X	X	X	X	
21MC0009			X	X			
21MC0010		X	X	X	X		
21MC0011	X		X	X	X		
21MC0012*	X	X	X	X	X	X	
21MC0013			X	X			
21MC0014				X			
21MC0015				X			
21MC0016	X		X	X	X	X	
21MC0017	X			X	X		
21MC0018			X	X		X	
21MC0019				X		X	
21MC0020			X	X	X	X	
21MC0021				X			
21MC0022			X	X	X		
21MC0023				X	X	X	
21MC0024			X	X		X	
21MC0025			X	X	X	X	
21MC0026			X	X			
21MC0027			X	X			
21MC0028			X				
21MC0029			X	X		X	

* Denotes Known Habitation Site

SUMMARY

Team members from the Bolton & Menk, Inc. Cultural Resource Team, led by Dale E. Maul, and from Minnesota State University – Mankato Geography Department, Dr. Donald Friend, Dr. Cynthia Miller, Rama Mohapatra, Ginger Schmid and Dr. Forrest Wilkerson, conducted the county-wide archaeological survey of McLeod County. The purpose of the county-wide archaeological survey was to summarize the prehistoric human occupation of the county, provide updated site files for known sites, find new sites, and to create a predictive model for site locations.

A surface reconnaissance survey was conducted for the McLeod County archaeological survey from March to June, 2012, by the Bolton & Menk, Inc. Cultural Resource Team. The McLeod County-wide survey began with reviewing the archaeological collections held by the McLeod County Historical Society and local collectors. Landowners within the county were contacted requesting permission to access their land for field surveys. Approximately 2,000 acres were surveyed in eleven townships: Acoma, Hutchinson, Winsted, Lyon, Hassan Valley, Bergen, Collins, Sumter, Glencoe, Helen, and Penn. McLeod County is within the Minnesota Archaeological Region 2n. McLeod County contained 13 previously known archaeological sites and 14 “Alpha Sites” prior to the survey.

The McLeod County-wide survey yielded 16 new archaeological sites, one of which was a confirmed Alpha Site, 21Mcc. All of the 16 sites identified are find spots or are sparse lithic scatters. Nine sites are considered Find Spots under *Thematic Context: Lithic Scatter* (Anfinson 1994:8). Find spots are characterized as containing a single artifact, usually a lithic tool or debitage. Sparse lithic scatters are described in *Thematic Context: Lithic Scatter* (Anfinson 1994:5) as sites with artifact densities of less than 0.01 per square meter. Seven sites are characterized as sparse lithic scatters, each consisting of between two and three lithics. The sparse lithic scatters all contained artifact densities of less than 0.01 per square meter. Lithic scatters are described in *Thematic Context: Lithic Scatter* (Anfinson 1994:5) as sites characterized as more than 5,000 square meters and artifact densities of more than 0.01 per square meter. Even the densest lithic scatter identified during the McLeod survey has an artifact density of just .0009 per square meter. The known sites encompass the Paleoindian, Archaic, Woodland, and Mississippian periods.

Of the nine Find Spots, four were identified by non-diagnostic artifacts, one was a single core, and one was an edge-modified flake. Three of the Find Spots and two sparse lithic scatters contained single projectile points. The projectile points were each incomplete, making it hard to assign a specific projectile point type. The Otto 3 projectile point is a point tip and is unidentifiable. The Harbarth projectile point was an isolated find located on a gentle slope toward a pond and wetland complex. This point may be a larger dart, but that is very uncertain due to the lack of distinguishing characteristics. The Duesterhoeft projectile point is a Samantha-like point. That point was identified in general upland that is not well-drained. The Paehkle projectile point is a Late Woodland side-notched point that was identified in general upland. This point was identified within a seasonally flooded basin near a judicial ditch. The Svoboda 1 projectile point exhibits reddish algal banding that may have caused unfavorable breakage patterns while knapping the point. The point appears to be incomplete at the tip and broken above the shoulders. It is made of Praire du Chien Chert and was identified 30 meters from a retouch flake of similar Praire du Chien Chert.

Of the 49 total pre-contact artifacts identified, the most common material type observed was chert (n=22), at 44.9 percent. Other prevalent material types include quartz (n=10, 20.4 percent) and Prairie du Chien Chert (n=9, 18.4 percent). Lesser amounts of Swan River Chert (n=4, 8.2 percent), Jasper Taconite (n=1, 2.0 percent), quartzite (n=1, 2.0 percent), Tongue River Silica (n=1, 2.0 percent), and chalcedony (n=1, 2.0 percent) were also observed. Of the raw materials identified, all are available within the State

of Minnesota. Prairie du Chien Chert is available in south central and southeastern Minnesota, Swan River Chert is found in northwestern, north central, and southwestern Minnesota, Jasper Taconite is found mostly in northeastern and east central Minnesota, and Tongue River Silica is found in central and parts of southern Minnesota (Bakken 1995).

Archaeological site **21MC0016**, the Svoboda 1 Site, consisted of 23 lithics and 2 square nails. The lithic material consisted of chert (n=9, 39.1%), Prairie du Chien Chert (n=8, 34.8%), quartz (n=3, 13.0%), Swan River Chert (n=2, 8.7%), and Jasper Taconite (n=1, 4.3%). The lithics consisted of 17 tertiary flakes, 2 secondary flakes, 2 shatter fragments, 1 microdebitage secondary flake, and the aforementioned projectile point tip.

The most important variables in site selection appears to be proximity to water and elevated topographic positions. A majority of sites are located near the east to southeast shores of water resources. Sites also commonly are within 250 meters of junctions of water bodies and water courses or near concentrations of large water bodies. The only known habitation sites are located on lake peninsulas.

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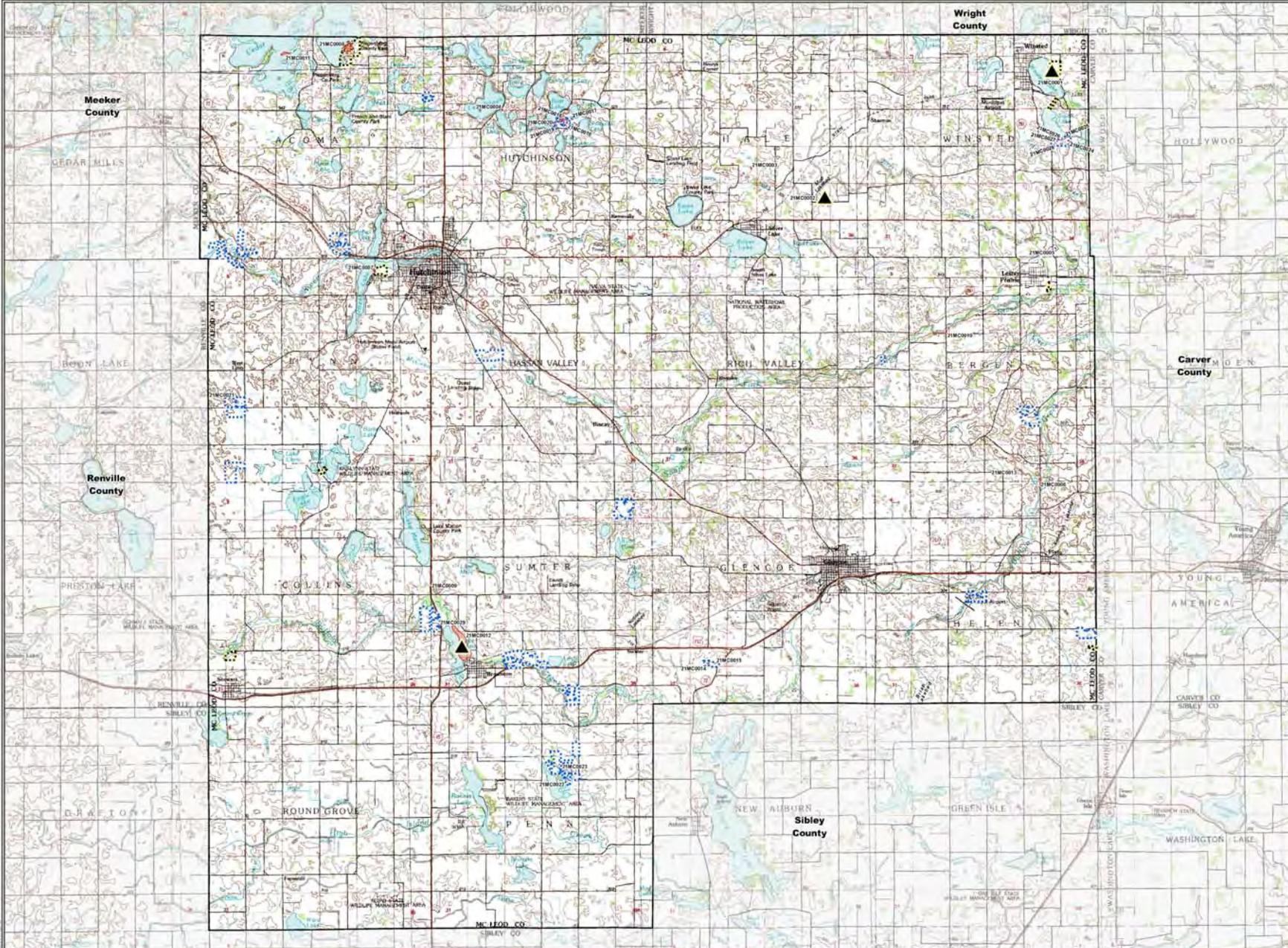
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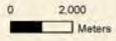
APPENDIX A – COUNTY-WIDE FIGURES



Legend

- ▲ Known Habitation Site
- Archaeological Site
- 2012 Survey Area
- Previous Survey

Source: MnDNR, MnGEO, USGS

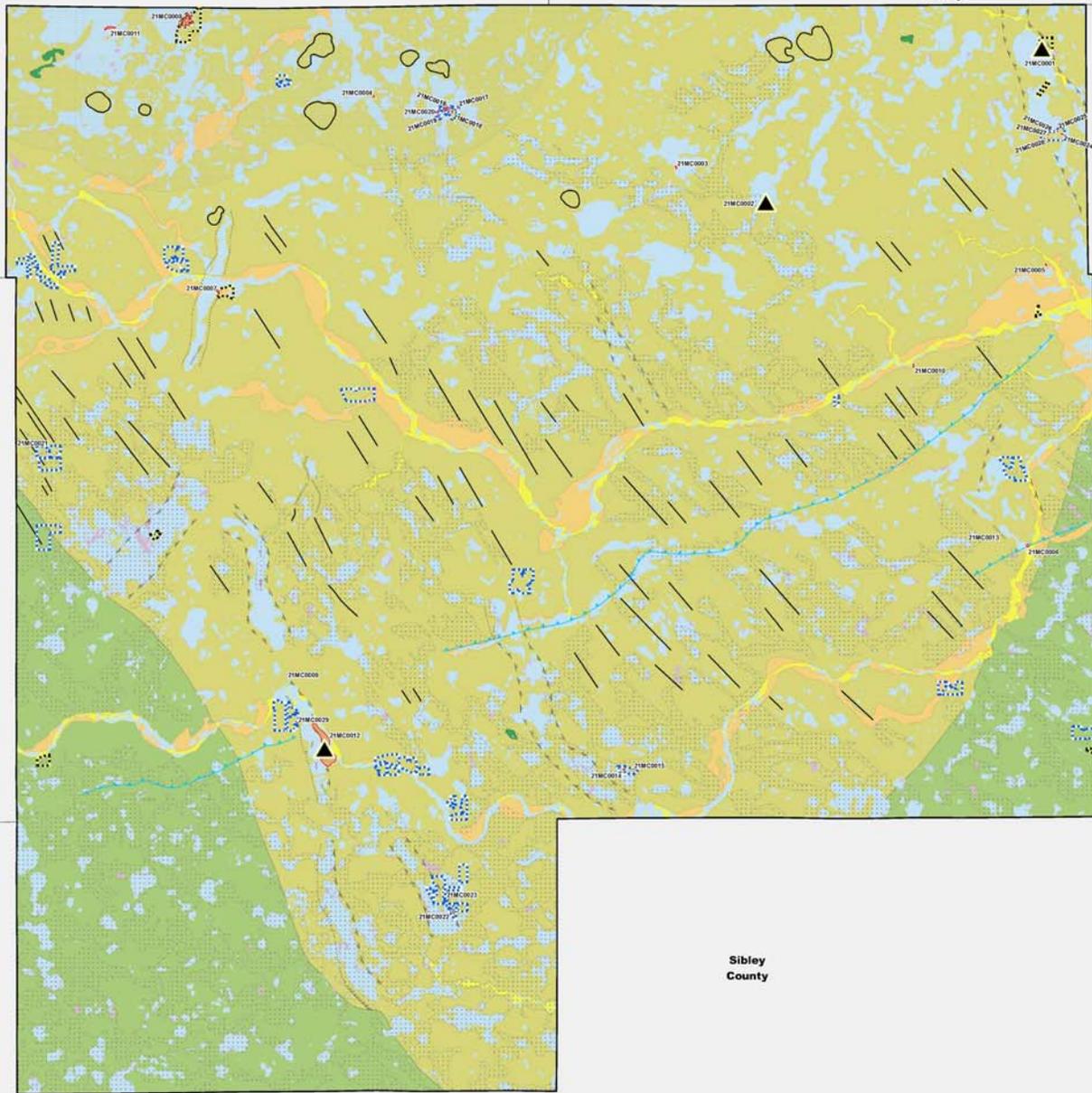


County Map

Figure A-1

July, 2013





Meeker County

Renville County

Wright County

Carver County

Sibley County

Legend

- ▲ Known Habitation Site
- Archaeological Site
- 2012 Survey Area
- Previous Survey
- Quaternary Geology**
- Lakebed Sediment, Silty Clay Loam to Loam
- Till, Loam to Clay Loam
- Till, Clay Loam to Sandy Loam
- Hummocky Terrain
- Thin Silt Loam to Silty Clay
- Geomorphic Features**
- Linear Ridge
- - - Broad, indistinct, irregular trough
- Esker
- Ice Margin
- Plateau

Source: MnDNR, MGS



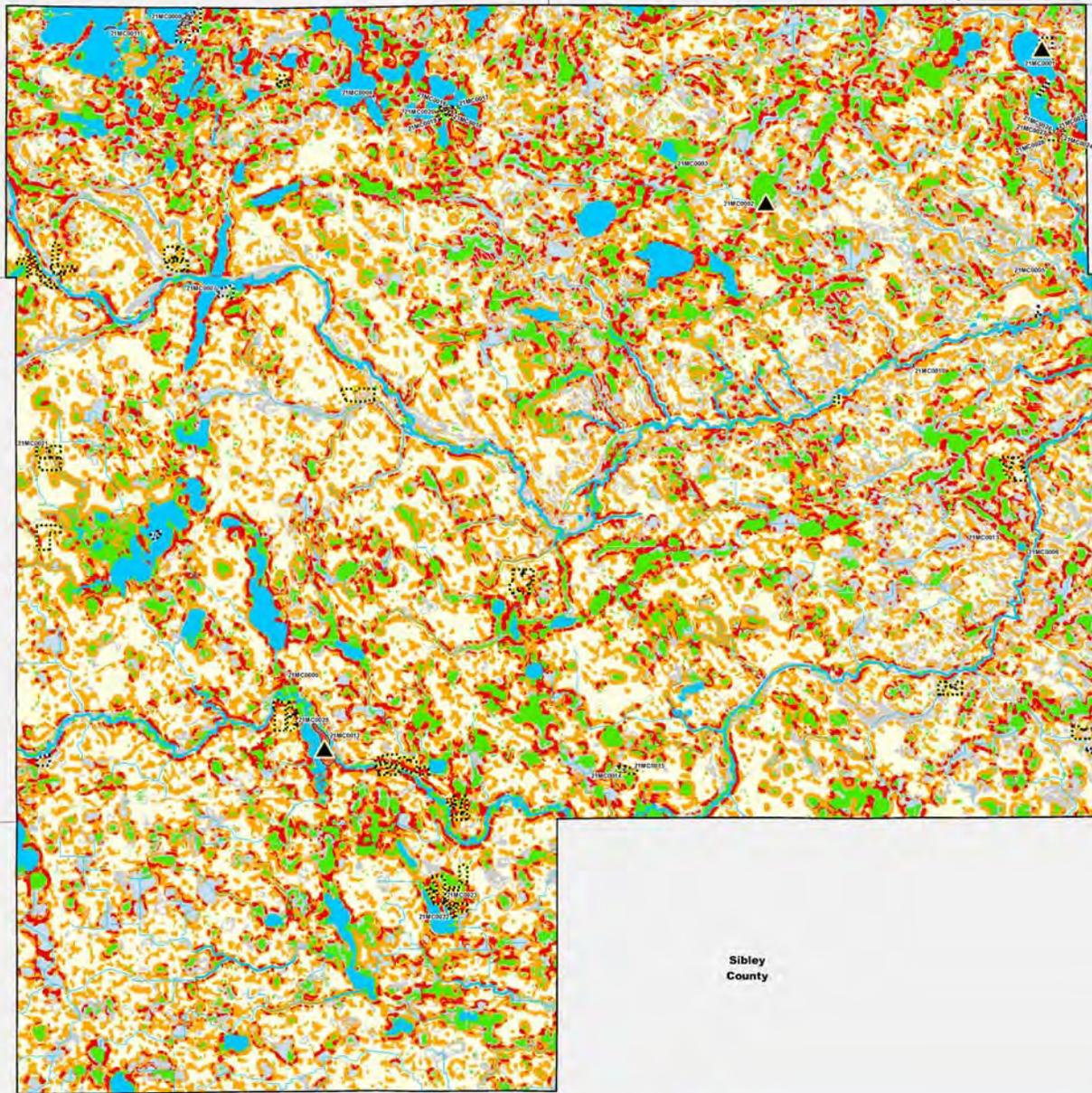
0 2,000
Meters

MGS County Atlas - Geology

Figure A-2

July, 2013





Legend

- ▲ Known Habitation Site
- ▭ Archaeological Site Boundary
- ⊙ 2012 Survey Area
- ⊙ Previous Survey

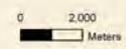
Water Resources

- Existing Lake
- Existing Wetland
- Former Lake/Wet Area
- Major Watercourse
- Stream or Ditch

Probability Class

- Very Low
- Low
- Medium
- High

Note: Some surveys (including those conducted along existing highways and pipelines) were omitted from this graphic due to variable survey methods.
Source: MCHS, RM, WRC



County-Wide
Probability
Model

Figure A-3

July, 2013



APPENDIX B – SURVEY AREA MAPS

Survey Area Maps Edited Out
of Public Version.

APPENDIX C – SITE FORMS

Site Forms Edited Out of Public Version

APPENDIX D – CATALOG

Catalog of Newly Identified Sites in McLeod County

Catalog #	Material	Object Name	Descriptor 2	Descriptor 3	Description	RecoveryDate	Length (mm)	Width (mm)	Weight (gr)	Collection Method	Horizontal Unit#	Landowner	Site Number
1.1	chert	tertiary flake			A tertiary flake of gray chert with some banding	03/30/2012	12.78	9.42	*	General surface	1a	Brian & Konnie Brinkmann	21MC0014
1.2	quartz	tertiary flake				03/30/2012	22.67	17.70	4	General surface	1b	Brian & Konnie Brinkmann	21MC0014
1.3	quartz	shatter				03/30/2012	15.75	12.04	1	General surface	1c	Wayne & Nathleen Mosey	21MC0014
2.1	quartzite	secondary flake			Light brown quartzite	03/30/2012	24.36	13.56	3	General surface	2a	Brian & Konnie Brinkmann	21MC0015
2.2	chert	secondary flake			Dark tan chert	03/30/2012	20.02	17.54	6	General surface	2b	Brian & Konnie Brinkmann	21MC0015
2.3	quartz	shatter			White quartz with some reddish color and crystalline structure	03/30/2012	17.84	13.94	1	General surface	2c	Brian & Konnie Brinkmann	21MC0015
3.1	Prairie du Chien chert	tertiary flake	distal fragment	heat-treated		03/30/2012	11.62	12.41	*	General surface	3a	Franklin & Joan Svoboda	21MC0016
3.2	chert	tertiary flake	proximal fragment		White chert	03/30/2012	14.51	19.34	1	General surface	3b	Franklin & Joan Svoboda	21MC0016
3.3	chert	tertiary flake	proximal fragment		Grayish white chert	03/30/2012	15.50	18.10	*	General surface	3c	Franklin & Joan Svoboda	21MC0016
3.4	chert	tertiary flake			Grayish white chert	03/30/2012	22.19	15.77	*	General surface	3d	Franklin & Joan Svoboda	21MC0016
3.5	chert	tertiary flake			Banded pink chert	03/30/2012	13.86	10.57	*	General surface	3e	Franklin & Joan Svoboda	21MC0016
3.6	chert	tertiary flake			Gray chert	03/30/2012	10.02	19.21	*	General surface	3f	Franklin & Joan Svoboda	21MC0016
4.1	jasper taconite	secondary flake				03/30/2012	25.49	32.77	7	General surface	4a	Franklin & Joan Svoboda	21MC0016
4.2	Prairie du Chien chert	tertiary flake	heat-treated			03/30/2012	20.01	19.27	2	General surface	4b	Franklin & Joan Svoboda	21MC0016
4.3	chert	shatter			Gray chert	03/30/2012	23.68	16.57	4	General surface	4c	Franklin & Joan Svoboda	21MC0016
5.1	Swan River chert	shatter				04/05/2012	20.10	15.97	2	General surface	5a	Franklin & Joan Svoboda	21MC0016
5.2	chert	tertiary flake			Gray and white baded chert	04/05/2012	13.42	10.80	*	General surface	5b	Franklin & Joan Svoboda	21MC0016
5.3	Prairie du Chien chert	secondary flake	heat-treated			04/05/2012	36.34	17.96	7	General surface	5c	Franklin & Joan Svoboda	21MC0016
5.4	Prairie du Chien chert	tertiary flake				04/05/2012	13.87	7.20	*	General surface	5d	Franklin & Joan Svoboda	21MC0016
5.5	quartz	tertiary flake				04/05/2012	30.07	21.81	9	General surface	5e	Franklin & Joan Svoboda	21MC0016
5.6	quartz	tertiary flake				04/05/2012	36.48	15.42	3	General surface	5f	Franklin & Joan Svoboda	21MC0016

Catalog of Newly Identified Sites in McLeod County

6.1	Prairie du Chien chert	projectile point	tip fragment	heat-treated	Heat treated Prairie du Chien chert projectile point, incomplete tip with broken base above shoulders	04/05/2012	23.76	24.40	4	General surface	6a	Franklin & Joan Svoboda	21MC0016
6.2	chert	tertiary flake	proximal fragment		White chert	04/05/2012	14.36	12.06	*	General surface	6b	Franklin & Joan Svoboda	21MC0016
6.3	Prairie du Chien chert	microdebitage	secondary flake	heat-treated	Proximal fragment of a microdebitage secondary flake	04/05/2012	5.75	3.81	*	General surface	6c	Franklin & Joan Svoboda	21MC0016
7	chert	tertiary flake			White chert	04/05/2012	13.04	20.41	*	General surface	7	Franklin & Joan Svoboda	21MC0017
8	Prairie du Chien chert	tertiary flake	proximal fragment			04/05/2012	13.43	13.15	*	General surface	8	Franklin & Joan Svoboda	21MC0016
9.3	chert	tertiary flake	medial fragment		White chert	04/05/2012	6.63	9.29	*	General surface	9c	Franklin & Joan Svoboda	21MC0016
9.4	Prairie du Chien chert	tertiary flake	heat-treated			04/05/2012	14.68	17.73	*	General surface	9d	Franklin & Joan Svoboda	21MC0016
9.5	quartz	tertiary flake				04/05/2012	13.17	7.53	*	General surface	9e	Franklin & Joan Svoboda	21MC0016
10	chert	tertiary flake			Banded gray chert	04/05/2012	12.77	8.54	*	General surface	10	Franklin & Joan Svoboda	21MC0018
11	Swan River chert	tertiary flake				04/05/2012	20.73	23.53	3	General surface	11	Franklin & Joan Svoboda	21MC0018
13	chert	tertiary flake			Grayish white chert	04/05/2012	24.55	14.84	2	General surface	13	Franklin & Joan Svoboda	21MC0019
14	chert	secondary flake			Grayish white chert	04/05/2012	25.39	32.24	12	General surface	14	Franklin & Joan Svoboda	21MC0020
15	Prairie du Chien chert	secondary flake	heat-treated			04/05/2012	27.21	40.05	8	General surface	15	Franklin & Joan Svoboda	21MC0020
16	chert	projectile point			Grayish white chert projectile point with a broken base and tip, base appears to be a short stem with slight corner notches	04/19/2012	33.07	16.72	3	General surface	16	Nathan Duesterhoeft	21MC0021
17	Swan River chert	projectile point			Triangular shaped point with excurvate sides and a broken base, material is Swan River chert with crystalline filled vugs	04/20/2012	37.15	24.77	7	General surface	17	Willmar & Eldonna Harbarth	21MC0022
19	Tongue River silica	projectile point			Tongue River silica triangular point with excurvate sides with side notches, broken base	04/26/2012	37.55	23.55	5	General surface	19	DuWayne Paehlke	21MC0023
20	Swan River chert	tertiary flake				04/05/2012	25.01	24.99	4	General surface	20	Franklin & Joan Svoboda	21MC0016
21	chalcedony	tertiary flake	distal fragment		Gray semi-translucent chalcedony	06/07/2012	16.55	22.07	1	General surface	21	Robert & Laurence Otto	21MC0024

Catalog of Newly Identified Sites in McLeod County

22	chert	secondary flake			Gray and tan chert	06/07/2012	29.67	19.02	5	General surface	22	Robert & Laurence Otto	21MC0024
23.1	quartz	secondary flake			Quartz secondary flake with vugs	06/07/2012	12.5	16.02	1	General surface	23a	Robert & Laurence Otto	21MC0025
23.2	chert	tertiary flake	proximal fragment		Gray chert	06/07/2012	26.98	22.64	2	General surface	23b	Robert & Laurence Otto	21MC0025
23.3	chert	shatter			Gray and white chert	06/07/2012	20.10	14.71	2	General surface	23c	Robert & Laurence Otto	21MC0025
24.1	quartz	projectile point	tip fragment		White quartz projectile point tip, appears to have fractured while finishing, broken base	06/07/2012	22.42	15.18	2	General surface	24a	Robert & Laurence Otto	21MC0026
24.2	quartz	tertiary flake	proximal fragment		Grayish white quartz	06/07/2012	15.68	13.85	*	General surface	24b	Robert & Laurence Otto	21MC0026
24.3	quartz	tertiary flake			Grayish white quartz	06/07/2012	18.62	21.17	2	General surface	24c	Robert & Laurence Otto	21MC0026
25	chert	tertiary flake			White chert	06/07/2012	15.06	9.14	*	General surface	25	Robert & Laurence Otto	21MC0027
26	chert	core			Grayish white chert core with banding, some cortex	06/07/2012	53.58	34.05	40	General surface	26	Robert & Laurence Otto	21MC0028
27	chert	tertiary flake	edge-modified			6/28/2012	25.68	17.74	3	General surface		Joel & Sheilia Griebie	21MC0029
9.1	metal	nail			Square nail	04/05/2012	70.05	7.46	12	General surface	9a	Franklin & Joan Svoboda	21MC0016
9.2	metal	nail			Square nail	04/05/2012	76.52	8.46	8	General surface	9b	Franklin & Joan Svoboda	21MC0016
										*denotes less than one whole gram			