Contents

The Southern Missouri River Study Unit

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2016

The North Dakota landscape has been changed considerably in most places by the large-scale developments of the 20th and 21st centuries. But a few places have been minimally altered, and some are nearly as they were late in prehistoric times. For example, in the Missouri River valley between Riverdale and Bismarck, there are largely undeveloped areas that must be very similar to the way they were when that stretch of river was part of the central homeland of pre-contact Mandan and Hidatsa peoples. The Nature Conservancy is endeavoring to restore and maintain a pristine sample of this land in the bottomlands, breaks, and upland grasslands at the Cross Ranch that will enable us to visually comprehend the premodern natural setting.

The associated historical record for the late 1700s and 1800s is virtually unparalleled in the wealth of information about the Missouri River valley and its inhabitants. There are many narrative descriptions of the river and the valley in the journals of explorers and traders who entered the North Dakota portion of the land of the Mandans, Hidatsas, and Arikaras. The journals of the Lewis and Clark Expedition are preeminent among the earliest historic accounts for significant notations regarding the natural history of this study unit (SU). The strengths and weaknesses of the various published versions of Lewis and Clark journals have been described in a condensed fashion by Clay Jenkinson (1988). In addition, Volumes 2 and 3 (Witte and Gallagher ed. 2010 and 2012) of *The North American Journals of Prince Maximillian of Wied* are essential resources documenting the 1833-1834 journey along the Missouri River into the interior of North America with vivid descriptions of native peoples, topography, natural history, and the extended stay at Fort Clark. Artist Karl Bodmer provides exquisite watercolors documenting the landscape and its peoples. *Twilight of the Upper Missouri River Fur Trade: The Journals of Henry A. Boller* (Wood ed. 2008) serves as another important historic reference for the mid-1800s. Numerous other artists, scientists, explorers, traders, and anthropologists provide a wealth of information during this time.

Description of the Southern Missouri River Study Unit

The Southern Missouri River Study Unit (SMRSU) is located in south-central North Dakota comprising portions of Burleigh, Emmons, Kidder, Logan, McIntosh, McLean, Mercer, Morton, Oliver, Sheridan, Sioux, and Stutsman counties. It contains lands on both the east and west banks of the Missouri from near Stanton in Mercer County, south to the North Dakota-South Dakota border (Figures 5.1 and 5.1A). The broadest expanses of territory lie east of the river in Missouri Coteau (the Coteau) terrain and Coteau Slope terrain outside of the Missouri River Trench (the Trench). The complete list of townships contained within the SMRSU is presented in Table 5.1.

Figure 5.1: Map of the Southern Missouri River Study Unit.

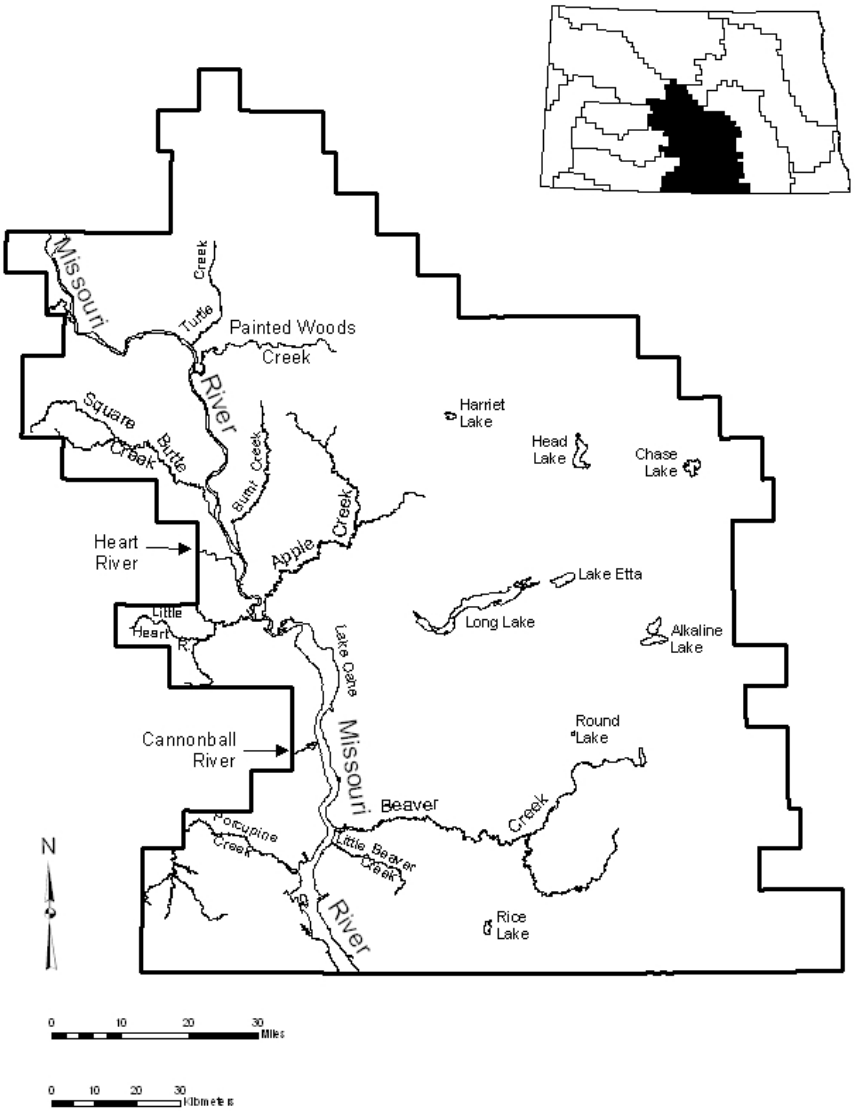

Figure 5.1A: Shaded Relief Map of the Southern Missouri River Study Unit.

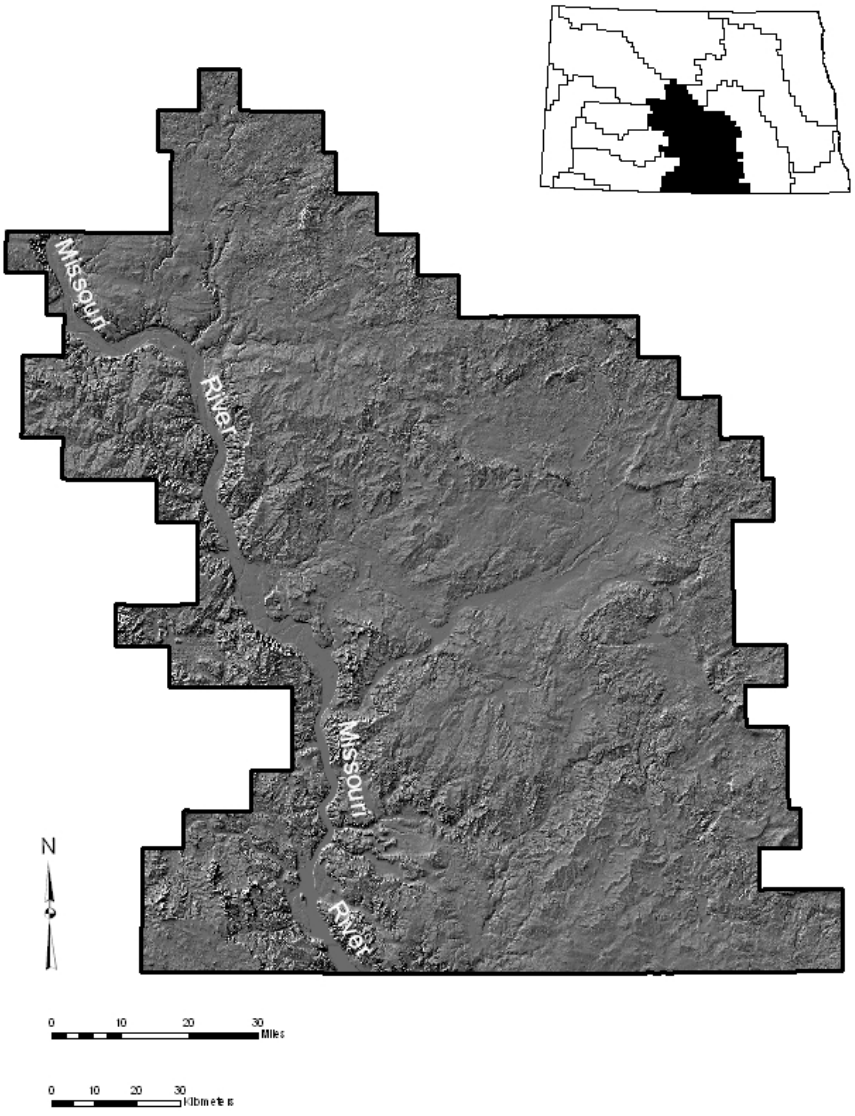

Table 5.1: Townships in the Southern Missouri River Study Unit.

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TOWNSHIP	RANGE
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TOWNSHIP	RANGE
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TOWNSHIP	RANGE
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TOWNSHIP	RANGE
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TOWNSHIP	RANGE
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The Standing Rock Sioux Tribe assumed State Historic Preservation Officer functions in Sioux County effective on August 14, 1996 (National Park Service letter dated September 11, 1996 to James E. Sperry of the State Historical Society of North Dakota). The functions assumed by the tribe in Sioux County include:

- Conduct a survey and maintain an inventory of historic properties
- Review Federal undertakings pursuant to Section 106
- Carry out comprehensive historic preservation planning
- Conduct educational activities
- Advise and assist Federal and State agencies and local governments

Since that date (August 14, 1996), any projects in Sioux County have been directed to:

Tribal Historic Preservation Officer
Standing Rock Sioux Tribe
PO Box D
Fort Yates ND 58538

There are 208 mi² of Sioux County within the SMRSU. The SMRSU section provides information currently housed at the SHSND up to August 5, 2015. The SHSND however has not received site forms or cultural resource reports for work conducted in Sioux County since National Park Service approval of Standing Rock as a Tribal Historic Preservation Office.

Physiography

The SMRSU is contained within the Glaciated Missouri Plateau Subsection of the Missouri Plateau Section of the Great Plains physiographic province (Bluemle 2016; Fenneman 1931; Hunt 1974; Pirkle and Yoho 1977). The three most prominent physiographic districts within the SMRSU are the Missouri Coteau, the Coteau Slope, and the Missouri River Trench districts. Also included is a small portion of an unnamed upland district immediately to the west of the Trench. The Missouri Coteau is of glacial origin, consisting of a dead-ice moraine with associated ice-disintegration features (Kume and Hansen 1965:1). Potholes and sloughs dot the surface of the rolling terrain of the Coteau. The Coteau Slope is a glaciated bedrock slope situated between the Coteau and the east wall of the Trench. Stream erosion from drainages flowing into the Missouri River has modified this sloping landform. Finally, the Trench is a broad Pleistocene valley composed of a minimum of four alluvial and outwash terraces (Clayton et al. 1976; Kume and Hansen 1965:1).

The physiographic and ecological diversity found within the SMRSU and the Garrison SU upriver fostered some of the most intensive prehistoric human settlement the state has witnessed, especially directly within the Missouri River valley and major tributary stream confluence environs. Within the Trench, Native Americans established essentially permanent residential bases in the bottomlands. Other site types such as mortuaries and special purpose ceremonial locations occur as well. Prehistoric

settlements, especially campsites, are also numerous in the prairie pothole country of the Coteau.

Drainage

The drainage pattern in the SMRSU is prescribed by the location of the Coteau. All drainage within this SU west of the Coteau flows into the Missouri River and the Mississippi River system draining southward to the Gulf of Mexico. This pattern holds for the vast majority of the SMRSU. The Coteau is essentially internally drained. Along the extreme northeastern fringe of the SMRSU, some minor drainages may flow northward into the Red River system and Hudson Bay.

The most prominent physical feature unquestionably is the Missouri River. Before the construction of impoundments such as Lake Oahe, the Missouri River flowed southward unimpeded in a broad, deeply entrenched valley. The Missouri River within the reach of this SU is fed by a series of higher order drainages including the Heart and the Cannonball, as well as a host of other lower order streams. These include Turtle Creek, Painted Woods Creek, Burnt Creek, Apple Creek, Beaver Creek, and Little Beaver Creek along the east bank, and Square Butte Creek, the Little Heart River, and Porcupine Creek along the west bank.

A number of good-sized natural lakes are found east of the Missouri River. These include Harriet Lake, Horse Head Lake, Chase Lake, Lake Etta, Long Lake, Alkaline Lake, Round Lake, Beaver Lake, and Rice Lake. All of these water bodies would have attracted game animals and human settlement during times of sufficient annual precipitation.

Climate

The present climate of the SMRSU is classified as a semiarid continental type. Seasonal extremes in temperature fluctuation are common. Summers are hot, while winters are long and cold. The mean January temperature is 9° F. The July mean rises to 72° F (NDSPB 1939a). Average precipitation in Oliver County is about 17 inches per year (Weiser 1975). Records for Bismarck earlier in this century indicate a slightly lower rainfall of about 14 inches per year (NDSPB 1939a). The North Dakota weather did not inhibit native groups from occupying the Trench on a year-round basis in early historic times (cf. Chomko 1986).

Landforms and Soils

Major landforms encountered in the SMRSU include (1) upland till plain, (2) breaks terrain, (3) river terraces, and (4) river floodplains (Lehmer 1971:49-54). Pedogenesis is different for each landform depending upon the particular parent material involved.

Natural Resources Conservation Service (NRCS) official soil survey resources are available online (NRCS 2016a, b, c). The Web Soil Survey in particular may be useful, as it has replaced the traditional county soil survey books.

- Electronic Field Office Technical Guide: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/
- Soil Data Mart: http://sdmdataaccess.nrcs.usda.gov/
- Web Soil Survey: https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/

Floodplains

The floodplains of the Missouri River and other watercourses are those parts of the valleys subject to annual flooding. Within the Missouri River valley, this is often termed Missouri Terrace 0 (MT-0). Prior to dam and reservoir construction, the Missouri River floodplain was expansive, in some cases as much as two miles wide, with the river meandering within this zone (Lehmer 1971:53). Today, one of the only remaining pristine portions of unflooded Missouri River bottomland occurs at the Cross Ranch near Hensler in Oliver County (Ahler et al. 1981, 1982).

The floodplain of the Missouri River comprises alluvial sediments that have built up to variable thicknesses since final retreat of Pleistocene glaciers. Like other major river systems in the Northern Plains, floodplain deposits may vary from several meters to many meters in thickness (Clayton et al. 1976; Toom 1988). The thickness of Holocene alluvial sediments in the Missouri River valley may be 30 m or more as they are in other major glacial meltwater drainageways in the state such as the James River and upper Souris River valleys. Often the floodplain is subdivided into lower (MT-O/A) and upper (MT-O/B) portions (Coogan 1983:7.9, Figure 7.5).

Terraces

These terraces are typically lateral, uneroded margins of prior stream beds or remains of former floodplains which now lie above the existing floodplain. Along other stretches of the Missouri River valley upstream and downstream from the SMRSU, three terraces have been defined (i.e., MT-1, MT-2, and MT-3) (Coogan 1980: Figure 7.6; Coogan and Irving 1959; McFaul 1985). The uppermost sediments in these terraces are Holocene in age, eolian in origin, and are classified in the Oahe Formation (Clayton et al. 1976; Reiten 1983). These flood-free, well-drained terrace surfaces were heavily utilized for situating warm weather residential settlements, most conspicuously in the form of earthlodge villages during the Plains Village period.

Breaks Terrain

The Missouri River “breaks” refers to the eroded and steeply dissected margins of the Trench. This distinctive terrain is similar in many respects to the valley wall and alluvial fan landforms described for smaller river valleys in the other SU. Intermittent and more permanent drainages enter the valley at many locations. Often times these appear as

woody draws along the Trench margin. Breaks terrain was very important to the hunting and gathering pursuits of Native Americans (cf. Ahler et al. 1981, 1982).

Upland Plains

The Missouri River Trench is incised into an Upland Till Plain. Soils developed from glacial outwash parent material form a thin mantle from the rim of the Trench out onto the upland plain away from the Missouri River. Numerous pothole lakes and sloughs dot the landscape in the uplands east of the river. The topography is primarily characterized by rolling knob and kettle terrain. There is archeological evidence of native use of the upland plains dating back to the Late Plains Archaic period (Root et al. 1983). Sites with stone rings and other rock features such as cairns were the most common types of sites encountered along the Northern Border Pipeline transect running northwest-southeast through the southern portion of this SU (ibid.).

Flora and Fauna

Numerous species of plants and animals were distributed across the landforms described above. Much of the following floral summary is abstracted from Burgess et al. (1973), while the faunal discussion is taken from Shelford (1963) and Seabloom et al. (1978).

The Northern Floodplain Forest occurs today in riparian zones which have not been cleared along the Missouri River and at the confluences with major tributaries. These forested areas are dominated by cottonwood *(Populus* sp.) with willow *(Salix* sp.), box elder *(Acer negundo),* and green ash *(Fraxinus lanceolate)* (Griffin 1977). Various sedges and grasses comprise the understory.

Mixed grass prairie covered the terraces and the uplands prior to modern developments. Stands of trees are present in draws, coulees, and other locations with adequate soil moisture below the level of the wind-swept prairie. Green needlegrass *(Stipa viridula),* blue grama *(Bouteloua gracilis)* and western wheatgrass *(Agropyron smithii)* are common components of this plant community. The prairie turnip *(Psoralea esculenta)* which grows in the uplands was an important food for some native people (cf. Denig 1961:11; Reid 1977).

In the report of excavation results for the Dancing Grouse site (32ML107), Deaver and Deaver (1987:11) identified wild plant foods with edible roots available in the site locality as textile onion, biscuitroot, wild turnip, and ground plums with edible fruits. They estimated that harvests of these plant foods during the spring and early summer from an area with a 1 km radius around 32ML107 would yield about 13,000 kg (13 metric tons dry weight) of these foods. They also noted that it has been estimated that people “could have achieved net calorie captures of 400-500 kcal per person-hour gathering these plants” (ibid.:13). Other plant foods in the Dancing Grouse site area included chokecherries, buffaloberries, gooseberries, and wild plums.

In the woody draws of the "breaks," bur oak *(Quercus* sp.) is present along with stands of green ash and cottonwood. The predominance of oak and ash has led to the use of the term "hardwood draws" for this biogeographic setting.

All of these floral communities are components of fit habitats for a variety of fauna. Large mammals include white-tailed deer *(Odocoileus virginianus)* and mule deer *(Odocoileus hemionus).* Bison *(Bison bison),* elk *(Cervus elaphus),* and antelope *(Antilocapra americana)* once were present also.

Predators include the wolf *(Canis lupis),* coyote *(Canis latrans)* and fox *(Vulpes).* A host of other smaller mammals and insectivores occur as well. Semiaquatic fur bearing species like the beaver *(Castor canadensis)* inhabiting the rivers and streams were trapped for their pelts and food (cf. Wishart 1979; Wood and Thiessen 1985). Numerous fish species are present in the Missouri River and tributaries. Catfish *(Ictalurus* sp.) regularly were exploited for food (Snyder 1988). Turtles and various mussels also occur in these aquatic habitats. Mussel shell was an important stock material in native technologies (cf. Picha 1988). Finally, a variety of avian species including eagles, hawks, owls, pelicans, magpies, and diverse waterfowl are recorded as permanent or seasonal inhabitants of the SMRSU. Many, if not all, of these faunal resources were exploited for food, clothing, or other purposes by native peoples who lived here.

Other Natural Resource Potential

A number of other natural resources, in addition to the floral, faunal, and water resources mentioned above, were important to the traditional native economies and technologies. These include various lithic materials employed in stone technologies. These technologies declined only after the introduction of Euro-American metal trade goods. Knife River flint (KRF) was preferred for making chipped stone tools in the northern half of the SMRSU. Other stones such as Tongue River silicified sediment (TRSS) were also important to Plains Village and earlier peoples living to the south near the Missouri-Cannonball confluence (cf. Ahler 1977b). The study of lithic utilization patterns through time and space is linked with many other research topics in the SMRSU.

Lithic materials such as granite and rocks of coal burn origin (clinker and scoria) served important functions in the secular and ceremonial spheres of the Plains Indian lifeways. Cobbles of granite were employed as construction materials and as sources of heat transfer in food preparation and ceremonial sweatbathing (cf. Ahler and Mehrer 1984). Large hammering, grinding, and abrading tools also were fashioned from granite. Clinker and scoria rocks had uses in domestic chores as well as ritual functions in the Plains Village ceremonial practices (cf. Ahler 1988c).

Overview of Previous Archeological Work

This section attempts to mention the most significant past archeological work that has been undertaken in the SMRSU.

Inventory Projects

As of 5 August 2015, there were 1,482 archeological sites and 911 archeological site leads and isolated finds in the state site files for the SMRSU. With an area of 9,639 mi², there is one site recorded for each 6.5 mi^2. The low number of recorded sites is due to several factors. First, the total of all intensively surveyed areas makes up only a small percentage of the 9,639 mi^2. Only 6.8% of the SU has been surveyed. This is especially apparent for lands situated outside of the Trench. Secondly, inundation of vast areas of Missouri bottomlands by the waters of Lake Oahe has hidden innumerable sites which would be found by modern site surveys. Many of the sites recorded in areas now inundated by the waters of Lake Oahe are prominent earthlodge village sites. Cultural resource management site inventory work preceding reservoir construction certainly did not meet today's standards. This assertion is based on results of more recent survey work undertaken in unflooded reaches of Missouri River bottomlands (cf. Larson et al. 1983, 1986; Penny et al. 1987; Weston et al. 1980).

The following comments are based on data for the 1,482 archeological sites. Tabular summaries on the following three pages consider variations in cultural/temporal affiliation and landform and property type. A word of caution: site totals vary in some cases because of incompletely coded data or uncoded data for some variables, and in other cases because multiple variables are recorded for some variables (e.g., a site might have both Middle Woodland and Plains Village components).

Inspection of Table 5.2 indicates that cultural/temporal affiliation is recorded as "unknown" for approximately 85% of the sites. This highlights the fact that less than 25% of the sites have been formally tested or excavated resulting in limited information regarding those locations.

Table 5.3 identifies the types of settings in which sites have been recorded. About 70.1% of earthlodge villages are on terraces. Terrace settings are also where several other kinds of sites frequently are encountered: CM scatters, earthworks, fortifications, graves, hearths, mounds, pits, and trails. Only a few property types are more prevalent on other landforms. Stone rings, other rock features, and rock art sites are more common on hills, knolls, bluffs, and ridges. There is less site diversity out on the plains away from the Trench and major tributary stream valleys.

The very low percentage of the sample located in draws (1%) is surely a reflection of the difficulty of finding sites in draws rather than an indication of actual site density in this setting. Throughout prehistory, draws have been favored for big and small game hunting and gathering a variety of wild plant foods. However, site deposits in this geomorphic setting are easily obliterated by gully-washing runoff, readily buried by alluvial sedimentation, and naturally concealed by dense ground cover of grasses, shrubs, and trees. Ahler et al. (1981:31-82) reported on the multiple component Bundlemaker site (32OL159) located in one of these woody draws in the breaks on the Cross Ranch. Test excavation revealed buried stratified cultural deposits reflective of a bison kill/processing

location. Other equally significant sites likely are present in similar physical settings throughout the SMRSU.

Table 5.2: Cultural/Temporal Affiliation of Archeological Sites in the Southern Missouri River Study Unit, 5 August 2015.

Paleo-Indian	
Clovis	1
Plano	1
Unspecified	12
Total	**14**
Archaic	
Early Large Side-Notched	2
Oxbow	3
McKean/Duncan/Hanna	19
Pelican Lake	16
Unspecified	35
Total	**75**
Woodland	
Sonota/Besant	28
Avonlea	4
Blackduck	1
Early Woodland	5
Middle Woodland	13
Late Woodland	4
Unspecified	4
Total	**59**
Plains Village	
Middle Missouri	12
Plains Village	129
Total	**141**
Plains Nomadic	
Total	**2**
Late Prehistoric	
Unspecified	86
Total	**86**
Historic	
Cheyenne	1
Hidatsa	5
Mandan	6
Sioux	2
Other	1
Unspecified	11
Total	**26**
Unknown	**2,227**

Table 5.3: Feature Type by Landform for Archeological Sites in the Southern Missouri River Study Unit, 5 August 2015.

	Cairn	Conical	CMS	Eagle	Village	Earth	Fort	Grave	Hearth	Jump	Mound	ORF	Pit	Quarry	Art	Shelter	Circle	Trail	Misc	TOTAL
Alluvial fan			2						1											3
Beach-River bank	1		27		2			5	6				3	1						45
Beach-line (glacial)			2						1											3
Butte			6		3	1		2	1			1			2		1			17
Canyon																	3			3
Delta												1								1
Draw			10		2	1				3	1	1	1				4		2	25
Flood-plain			14		12	1			7	2		1	2				3	1	1	44
Hill-Knoll-Bluff	91		169	1	6	3	1	18	11	1	10	77	13	1	10	1	193	1	2	609
Island			1																	1
Levee			1																	1
Other	4		20		3			3	2		2	2	2		1		10			49
Ridge	71		97	1		1	1	5	12	1	5	54	6	2	5	2	201	3	1	468
Saddle			4						1		1	1					4			11
Sandbar			2					1												3
Spur	3		23			1		2	2		1	1	1				12	1		47
Swale	1		4			1			1			2					5			14
Terrace	6		295		114	15	12	32	50	2	20	3	46	1	1		14	7	10	628
Upland Plain	17	2	48					6	1		2	6	4		1		56	2	4	149
Valley wall foot slope	1		37		19	1		2	3		2	1	5	1			6	1	1	80
TOTAL	195	2	762	2	161	25	14	76	99	9	44	151	83	6	20	3	512	16	21	2201

Conical=Conical Timber Lodge; CMS=Cultural Material Scatter; Eagle=Eagle Trapping Feature; Village=Earthlodge Village; Earth=Earthwork; Fort=Fortification; ORF=Other Rock Feature; Art=Rock Art; Shelter=Rock Shelter; Circle=Stone Circle; Misc=Miscellaneous

Western American cartography provides a valuable source of information regarding the course of the Missouri River over time. In addition, these maps detail information regarding ecological and cultural features. The earliest maps relevant to this SU include those of Mackay and Evans (Wood 2003), Lewis and Clark (Moulton 1983), Lieutenant G.K. Warren's 1855 and 1856 maps (Callaway and Wood 2012), and the 1893 Missouri River Commission maps.

The first reported inventory work is attributed to Theodore H. Lewis (1890). Lewis, an avocational archeologist and surveyor, located and mapped eight mound sites along the Missouri River on behalf of the Northwestern Archeological Surveys (NWAS) sponsored by Alfred J. Hill. Lewis also visited a number of prominent earthlodge villages in the Upper Knife-Heart region and in 1883 produced a detailed map of the Molander site (32OL7). He also prepared sketch maps and took notes regarding several other village sites during his 1883 excursion (Wood 1986c:49). These NWAS materials are currently housed at a Minnesota Historical Society archives facility in St. Paul.

A number of site reconnaissance and mapping projects were carried out during the early decades of the 20th century which are not listed below. Wood (1986:49-54), in a seminal article about early cartography in the upper Missouri, summarizes early mapping projects overseen by Orin G. Libby of the SHSND. These maps and other Libby documents are housed at the Heritage Center, Bismarck, North Dakota. A number of other individuals were actively involved in documenting the location of Indian villages and campsites in the Missouri River valley. These include George F. Will, Herbert J. Spinden, and Thad C. Hecker, among others. Contributions from these early investigations are apparent in the following works: Will and Spinden (1906), Will and Hyde (1917), Will (1924), and Will and Hecker (1944). During this same period, other researchers such as Gilbert L. Wilson, were working upriver collecting valuable ethnographic and ethnohistoric information among the Hidatsa (cf. Bowers 1963; Gilman and Schneider 1987; Weitzner 1979; Wilson 1910, 1916, 1917, 1924, 1928, 1934, 1971).

During the 1920s and 1930s, reconnaissance work focused primarily on the prominent earthlodge village sites in the Trench. Information developed by investigators such as William Duncan Strong (Strong 1940) and Alfred W. Bowers (1930, 1948, 1950, 1963) is referred to below in the archeological context discussions.

Following World War II, site inventory projects were conducted by Smithsonian Institution, River Basin Surveys (SIRBS) personnel on several occasions (Banks and Czaplicki 2014; Thiessen 1999). This work was tied to anticipated construction of the Garrison Reservoir (Kivett 1948; Metcalf 1951; Metcalf et al. 1953) and the Oahe Reservoir (Cooper 1953; SIRBS 1965). After the inundation of Missouri River bottomlands by these massive man-made lakes following completion of the dams in 1953 and 1958 respectively, little additional site inventory work was conducted anywhere in the SMRSU for 15 years.

As a result of compliance with new public laws and regulations requiring that prehistoric and historic properties be considered in the process of planning federally

funded developments, an increasing number of site inventory projects were conducted in the late-1970s (Swenson et al. 2016:65-84). Many of these surveys were undertaken where coal and electric power developments and road improvements were planned.

Several of the site inventory projects involving expansive tracts of land resulted in the identification of large numbers of previously unrecorded sites. In 1979, 10,000 acres were surveyed at the Cross Ranch in Oliver County. A total of 159 archeological and historical sites and 41 isolated finds were identified (Weston et al. 1980:20). Subsequent investigations at Cross Ranch have added more sites to this total (Ahler et al. 1981, 1982). Archeological properties were found in all four physiographic zones of the Trench defined for the Cross Ranch area. The results of this survey suggest great numbers of archeological sites previously existed above water along stretches of the Trench now inundated or otherwise disturbed or destroyed by construction of the dam reservoir project.

Intensive cultural resources inventory work at the Knife River Indian Villages National Historic Site (KNRI) resulted in the identification of a significant number of previously unrecorded sites (Lovick and Ahler 1982). “Intensive” survey of the KNRI involved implementing a variety of site identification field procedures resulting in the documentation of a sometimes continuous distribution of artifacts from Native American occupations spread across extensive portions of the KNRI; 55 sites were recorded covering 25% of the 1300-acre surface area of this National Park Service (NPS) property.

From 1976 through 1981, magnetic surveys were conducted at select areas of the KNRI, including Sakakawea Village (32ME11), Lower Hidatsa Village (32ME10), and Big Hidatsa Village (32ME12) (Weymouth 1988). Eleven of the 1,300 total acres were investigated. Two proton magnetometers in difference mode were used to cover each 20-x-20-m survey block (ibid.:5). The most common anomalies observed were remnants of earthlodges, middens, and past excavation trenches.

Surface inventory and limited testing were carried out over a 300-acre parcel of the KNRI in 1994. Specifically, the project area was on the west bank of the Missouri River approximately three miles north of the confluence with the Knife River. Archeological sites recorded or updated consisted of artifact scatters, the Stanton Mound Group (32ME104), and the Northern Trail Complex (32ME476) (Metcalf 1995). The Northern Trail Complex is “a series of deeply incised travois trails [that] lead generally northward from Big Hidatsa Village” (ibid.:20). As evinced by the artifacts observed at the 10 sites investigated, the area has been occupied since the Early Plains Archaic period.

A large-scale intensive survey was conducted along a transect for the Northern Border Natural Gas Pipeline right-of-way. Scores of previously unrecorded sites were identified along its narrow corridor through the SMRSU (Root and Gregg 1983).

Three major surveys were conducted along portions of the east and west shores of the Lake Oahe (Larson et al. 1983, 1986; Penny et al. 1987). Even with all of this

attention, resurvey during different times of year and under different lake level conditions inevitably results in the identification of additional previously unrecorded sites, many of which are appraised as “historic properties.”

Between 1988 and September 2007, approximately 500 inventories within the SMRSU were reported to the North Dakota State Historic Preservation Office (ND SHPO), the majority (44%) of which relate to transportation projects. Twenty-two percent result from rural and urban development (waterlines, lagoons, utility lines, and communication lines and towers). Other inventories focus on the natural environment (16%) and energy development and production at coal mines and windfarms (5%).

Over the years, several transportation projects along ND Highway 1806 have required cultural resource inventories and evaluative testing. A lengthy stretch of the road runs north-south, west of the Missouri River in Oliver and Morton counties, an area rich in archeological sites. Within the previously disturbed 100-ft project corridor, the boundaries of two sites (32OL12 and 32OL14) were expanded. The sites are cultural material scatters, with Pelican Lake and Plains Village components identified at 32OL14 (Larson 1992:13, 18).

From 1989 to 1993, the North Dakota Department of Transportation (NDDOT) conducted inventories and evaluative testing for a bypass of ND 1806 around Fort Abraham Lincoln in Morton County. As with other projects along the highway, the corridor had been disturbed by agricultural activities, road construction, and urban expansion. Two sites, 32MO291 and 32MO292, were examined during the investigation. Both sites are cultural material scatters located within the plow zone and heavily disturbed. Artifacts indicate the sites date to the Heart River phase of the Post Contact Coalescent period (Christensen 1993). Monitoring was recommended due to the proximity of the project corridor to Fort Abraham Lincoln.

State Historical Society of North Dakota (SHSND) archeologists delineated boundaries and evaluated sites 32MO42 and 32MO51 in 2000. The sites are earthlodge villages, originally reported by Will and Hecker in 1944, located within the Harmon Village Third Subdivision along ND 1806 (Swenson and Picha 2000:1). Circular earthlodges and ceramics suggest occupation dates of AD 1600 or 1700 for the sites. Sites 32MO42 and 32MO51 have been recommended eligible for the National Register of Historic Places (NRHP).

In 2001, archeologists investigated numerous Plains Village sites and site leads on both sides of the Missouri River from the confluence with the Little Heart River north to the confluence with Coal Lake Coulee. The objectives of the project were (1) to locate, inventory, and update sites, (2) to examine ceramics from site collections curated at the SHSND (Ahler 2001), and (3) to conduct a Class III inventory of 1,120 acres previously not surveyed (Metcalf 2001:1). Archeologists successfully evaluated 44 sites and site leads (ibid.:Table 1).

An inventory was completed for replacement of more than 16 miles of utility lines west of the Missouri River between the Cannonball and Little Heart rivers. Cultural properties identified within the project corridor span the Paleo-Indian (Paleo) through historic periods. The archeological components include unnamed Paleo (32MO163), Hanna and Pelican Lake (32MO98), McKean (32MO100), Besant/Sonota and Avonlea (32MO98, 32MO100, 32MO163), Extended Middle Missouri variant (32MO7, 32MO10), Post Contact Coalescent variant (32MO15), Terminal Middle Missouri variant (32MO104), and unnamed Plains Village (32MO98, 32MO163, 32MO166) (Christensen 1990:Table I).

A 1,920-acre tract, within the drainage area of Square Butte and Otter creeks, was surveyed for a proposed watershed dam. Eighteen archeological sites were recorded, including: 13 cultural material scatters, two stone circle sites, and one rock cairn site (Good 1993:Table I). The artifacts indicate the area has been utilized for at least 1,000 years (ibid.:5).

In 2005, archeologists conducted intensive inventories of several tracts for a proposed wind farm near Wilton, North Dakota. The project area was seven miles east of the Missouri River in rolling grasslands. Three archeological lithic scatters were recorded, two on the surface in plowed fields (32BL545 and 32BL546) and one beneath the surface in native prairie (32BL547) (Stine et al. 2005). Knife River flint, Swan River chert (SRC), and TRSS flakes and tools comprise the lithic artifacts (ibid.:5.3-5.9).

Over the years, several inventories, encompassing tens of thousands of acres, have been conducted for the Falkirk Mining Company within the SMRSU (Boughton and Brownell 1994; Boughton et al. 2007b; Walker-Kuntz 1999). The area of operation ranges from the Missouri River floodplain to terraces cut by drainages to rolling grasslands with intermittent wetlands resulting from glacial advancement and recession. Archeological properties recorded in the area include lithic scatters comprised mainly of KRF, stone circle sites, and rock cairn sites.

Nearly 6,000 acres in Oliver County were inventoried in 2006 for The Coteau Properties Company (Boughton et al. 2007a). Topographically, the project area is in rolling grasslands with Square Butte Creek running west to east through the southern portion. Fourteen prehistoric sites were recorded during the survey, including stone features, lithic scatters, and cultural material scatters. Investigators note that the majority of the scatters were found in plowed fields.

Between September 2007 and August 2015, 490 inventories within the SMRSU were submitted to the ND SHPO. The majority (61%) relate to transportation and material source projects. The high percentage is partially due to the numerous Federal Emergency Management Agency (FEMA) disaster declarations (flooding and storms) in 2009-2011 and 2013-2014 for material source areas for the recovery. Seventeen percent result from rural and urban development (waterlines, utility lines, communication lines and towers). Other projects result from energy development such as coal mines, wind farms, transmission lines, and compressor stations (13%). Various other projects (tree

plantings, fences, bank stabilization, recreation, and research) make up the remaining 9% of submitted reports.

During this time frame the US Army Corps of Engineers (USACE) contracted for surveys along Lake Sakakawea in Mercer and McLean counties for the purpose of (1) relocating previously recorded sites; (2) identifying unrecorded sites; and (3) preparing a comprehensive report of background literature, findings, and recommendations (Baer et al. 2010; Hulbert et al. 2010). The same was undertaken on lands around Lake Oahe in Burleigh, Morton, Emmons and Sioux counties (Ziets et al. 2009). These surveys on federal property are vital in order to monitor conditions of sites previously recorded but include the identification of additional cultural resources.

Another major survey was conducted as a result of Falkirk Mining Company expanding their mining operations within a 20,459-acre area in McLean County (Boughton et al. 2007). These large block surveys in mine areas provide important settlement pattern information over expansive areas across various environs.

Few sites had been recorded along Apple Creek, yet this tributary of the Missouri River is likely to have many prehistoric sites. A Historic Preservation Fund Grant through the SHSND was funded to conduct a Class III cultural resource inventory of select parcels (1,240 acres) (Engel and Barth 2010). Twenty sites were recorded and contacts with many landowners expanded our knowledge of this drainage. Possible Paleo through Plains Village sites are represented.

The preceding brief review of select inventory projects highlights the importance of large- and small-scale surveys in documenting significant sites and areas of high site densities (cf. Ahler et al. 1979; Wilt and Swegle 1980).

As part of background studies for large-scale inventory projects, researchers should attempt to make use of LANDSAT imagery of groundcover available for North Dakota (cf. Reid and Johnson 1978) supplemented by aerial photographic coverage (cf. USDA 1937). Recent digital imagery is available from several online sources (Google Earth 2016; ND GIS 2016; NRCS 2016a), including:

- North Dakota GIS Hub (NDGIS): https://www.nd.gov/itd/statewide-alliances/gis
- Natural Resource Conservation Service: https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/
- Google Earth: https://www.google.com/earth/

Formal Test Excavation Projects

Table 5.4 presents a list of manuscripts from test excavation projects within the SMRSU. The list of investigations classed as test excavation has a somewhat shorter history than those for inventory, major excavations, or other work. However, results derived from these explorations have helped lay the cultural chronological foundations for this SU. Many important contributions to regional prehistory have stemmed from this class of inquiry.

Table 5.4: Test Excavation Projects in the Southern Missouri River Study Unit, 5 August 2015.

Year	First Author	Second Author	Title	Site Number	Ms #
1978	Dill, C.		Preliminary Report: Baukol-Noonan Center Mine Tipi Ring Sites Testing Project- 1978, Oliver County, ND	32OL116, 32OL118, 32OL119, 32OL120, 32OL121, 32OL122, 32OL123, 32OL124	307
1978	Good, K.	J. Hauff	Archaeological Test Excavation at the Anderson Tipi Ring Site (32ML111), McLean County, ND: A Cultural Resource Study in Central ND	32ML111	552
1978	Taylor, J.		Report of Cultural Resource Inventory Concerning a Proposed Road and Bridge Relocation Project of Mercer County Route 542 Through the Knife River Indian Villages National Historic Site, McKenzie County, ND	32ME410	586
1978	Ahler, S.		Archaeological Field Research in the Knife River Indian Villages National Historic Site, Summer 1978, Mercer County, ND	32ME407, 32ME10, 32ME409, 32ME 408	
1978	Griffin, D.	S. Ahler	Testing and Evaluation of Archeological Sites 32ML404 and 32ML406 in McLean County, ND	32ML404, 32ML406	647
1979	Weston, T.	S. Ahler	Cultural Resources Survey and Test Excavations in the Path of Proposed Widening and Upgrading of County Route FAS 2910 in Mercer County, ND	32ME74	924
1979	Ahler, S.		Archaeological Field Research in the Knife River Indian Villages National Historic Site, Summer 1979, Mercer County, ND	32ME413, 32ME412, 32ME9	934
1980	Ahler, S.	F. Schneider	Test Excavations at the Slant Village Site (32MO26), Fort Lincoln State Park, ND	32MO26	1693
1981	Rippeteau, B.		Oliver County, Lewis & Clark Trail Testing Program	32OL416, 32OL419,	2412
1981	Rippeteau, B.		Oliver County Lewis & Clark Trail Testing Addendum: Continued Testing at 32OL417/418 (Badcurve Site), 32OL9 (Smith Farm Village Site), 32OL11 (Lower Sanger Village Site), and 32OL421 (Blackwater Site)	32OL9, 32OL11, 32OL421	2413
1981	Rippeteau, B.		Lewis & Clark Trail Test Site 32OL258	32OL258	2414
1981	Ahler, S.	T. Weston	Test Excavations at Lower Hidatsa Village (32ME10), Knife River Indian Villages National Historic Site	32ME10	2476
1981	Ahler, S.	E. L. Mehrer	Consol 4 Project: Archeological Reconnaissance and Test Excavations in the Glenharold Mine Area, Oliver County, ND	32OL207, 32OL210, 32OL265	2481
1981	Good, K.	M. Schreiner	Historical and Archaeological Survey and Testing Project--Proposed Mining Area--Falkirk Mine, McLean County, ND	32ML108, 32ML109	2542
1981	Ahler, S.		Preliminary Report Concerning Location and/or Evaluation of Eight Archaeological Sites in Section 9, T143N, R84W, in the Glenharold Mine Area, Oliver County, ND	32OL207, 32OL210, 32OL265	2559
1981	Root, M.		Archeological Site Survey and Testing Along the Northern Border Pipeline, North Dakota:	32EM18, 32EM22, 32EM23, 32EM24,	2564

Year	First Author	Second Author	Title	Site Number	Ms #
			Annual Progress Report, 1980, McKenzie, Mercer, Dunn, Stark, Morton, Emmons, McIntosh, and Williams Counties	32EM25	
1981	Ahler, S.	C. Ho Lee	Cross Ranch Archeology, Test Excavations at Eight Sites in the Breaks Zone, 1980-81 Program (Contribution No. 154), Oliver County, ND	32OL159, 32OL252, 32OL161, 32OL156, 32OL165, 32OL163, 32OL173, 32OL178	3668
1982	Robson, L.		Proposed Land Sales Along McClusky Canal, Burleigh, Sheridan, and McLean Counties, ND	32BL35, 32SH191, 32SH181, 32SH178, 32SH187	2848
1982	Schreiner, M.	D. Melton	Archeological Test Excavation Project: Three Previously Recorded Archeological Sites, Glenharold Mine, Oliver County, ND	32OL209, 32OL263, 32OL264	2893
1982	Good, K.	D. Melton	Cultural Resource Investigations: Archeological Testing and Mapping of Site 32ME519 and Mapping of Site 32ME87, Glenharold Mine, Mercer County, ND	32ME519	3230
1982	Ahler, S.	C. R. Falk	Cross Ranch Archeology, Test Excavations at Twelve Sites in the Breaks and Upland Zones, 1981-82 Program (Contribution No. 174), Oliver County, ND	32OL162, 32OL177, 32OL253, 32OL153, 32OL175, 32OL172, 32OL170, 32OL266, 32OL179, 32OL260, 32OL261, 32OL165	3669
1983	Kjos, J.	G. Fox	Evaluations of Five Archaeological Sites and One Historic Site, Glenharold Mine Area, Oliver County, ND Volumes I and II	32OL226, 32OL242, 32OL267, 32OL269, 32OL270	3132
1983	Herbort, D.	P. Anderson	Cultural Resource Evaluation and Assessment on the Proposed Falkirk Mining Areas D, F, and G, McLean County, ND	32ML144, 32ML148, 32ML152, 32ML153, 32ML159, 32ML160, 32ML147, 32ML151, 32ML161	3120
1983	Good, K.		Testing and Evaluation of Seven Archeological Sites Within Glenharold Mine, Oliver County, ND	32OL226, 32OL242, 32OL267, 32OL269, 32OL270	3233
1983	Root, M.	M. Gregg	Archeology of the Northern Border Pipeline, ND: Volume 3, Test Excavations, McIntosh, Emmons, Morton, Stark, Mercer, Dunn, McKenzie, and Williams Counties, ND	32MO78, 32MO80, 32MO256, 32MO259, 32MO61, 32EM21, 32EM33, 32EM57, 32EM58, 32EM59, 32EM60, 32EM61, 32EM62, 32EM38, 32EM106, 32EM107, 32EM25, 32EM44, 32EM49, 32EM18, 32EM22, 32EM23, 32EM24, 32MT59	3456
1984	Ahler, S.	E. Mehrer	The KNRI Small Sites Report: Test Excavations at 8 Plains Village Archeological Sites in the Knife River Indian Villages National Historic Site, Mercer County, ND	32ME412, 32ME383, 32ME9, 32ME407, 32ME409, 32ME413, 32ME414, 32ME415	3547
1984	Deaver, K.	B. Coutant	Archaeological Site Testing and Evaluation of Sites 32ML148 and 32ML270 McLean County , ND	32ML148, 32ML270	4610

Year	First Author	Second Author	Title	Site Number	Ms #
1984	Deaver, K.	B. Coutant	Archaeological Site Testing and Evaluation of Site 32ML265, McLean County, ND	32ML265	4663
1984	Deaver, K.	B. Coutant	Archaeological Site Testing and Evaluation of Sites 32ML107, 32ML110 and 32ML210, McLean County, ND	32ML107, 32ML110, 32ML210	3944
1984	Fredlund, L.	D. Herbort	The Mitigation of Archeological Site 32OL270, Glenharold Mine, ND, Volumes I and II	32OL270	3246
1984	Greiser, T.		Testing & Evaluation of Site 32ML152 Near Underwood, McLean County, ND	32ML152	3365
1985	Deaver, K.		Letter Report: Pulver Mound (32ML112) Site Test Results	32ML112	3948
1985	Toom, D.	S. Ahler	Archeological Investigations for Small-Scale Construction Projects at Six Locations in the Knife River Indian Villages National Historic Site (Contribution No. 226), Mercer County, ND	32ME366, 32ME9, 32ME312, 32ME409	3888
1985	Toom, D.	S. Ahler	Test Excavations at the Lower Hidatsa West Site (32ME499), Knife River Indian Villages National Historic Site	32ME499	3553
1986	Borchert, J.		Archaeological Testing at the Five Sites in the Baukol-Noonan Center Mine, Oliver County, ND	32OL282, 32OL289	4104
1987	Hunt, W.		Subsurface Test Excavation at a Water Well Head, Taylor Bluff Site (32ME366), Knife River Indian Villages National Historic Site, ND	32ME366	4286
1989	Borchert, J.		Evaluative Test Excavations at 32MO137, 32MO138 and 32MO140 Morton County, ND	32MO140	4796
1989	Spath, C.	R. Christensen	Otter Creek Class III Cultural Resource Inventory, Oliver County, ND	32OL317	4932
1990	Peterson, L.	D. Klinner	Evaluation of 15 Prehistoric and Historic Sites in the BNI Coal, Ltd, Center Mine, Oliver County, ND	32OL298, 32OL299, 32OL300, 32OL301, 32OL302, 32OL303, 32OL304, 32OL305, 32OL306, 32OL307, 32OL308	5033
1990	Späth, C.		Square Butte Creek, in Morton County, Reach Three Project, Phase I Testing	32MO148, 32M037	5084
1990	Wermers, G.	J. Borchert	32OL293 and 32OL294 Archaeological Investigations West Sanger Road Oliver County, ND	32OL293, 32OL294	5259
1992	Christensen, R.		32MO177: NDDOT 1992 Test Excavations Project #NH-1-006(006)042	32MO177	5683
1993	Christensen, R.		ND Highway 1806 Archaeology: Class III Inventory and Evaluative Testing at 32MO141, 32MO291 and 32MO292 Project No. DPC-1-806(018)062	32MO291, 32MO292	6088
1994	McKibbin, A.	M. McFaul	32EM72: Results of Test Excavations on the East Shore of Lake Oahe, Emmons County, ND	32EM72	6475
1995	Metcalf, M.		Knife River Indian Villages National Historic Site in Mercer County: Cultural Resource Inventory of the 300 acre Krieger Parcel	32ME104, 32ME299	6495
1996	Peterson, L.		Investigation at 32ML872 a Stone Ring Site in	32ML872	6687

Year	First Author	Second Author	Title	Site Number	Ms #
			McLean County, ND		
1996	Stine, E.		32EM1086 and 32EM1088: Results of Testing for a Bridge Replacement & Road Realignment, Emmons County, ND	32EM1086, 32EM1088	6739
1997	Kulevsky, A.	E. Stine	32MO27 Evaluative Testing, Morton County, ND	32MO27	6870
1997	Boughton, J.		BNI Coal Mine: Testing & Evaluation of 32OL286 and 32OL338 Two Prehistoric Sites Southwest of Center, ND	32OL286, 32OL338	6940
1997	Rothwell, S.	T. Larson	Results From an Archeological Testing Program Carried Out at 32SL286, 39WW46, 39WW47, 39WW48 and 32EM203, Lake Oahe	32EM203	6958
1997	Christensen, R.		ND Highway 1806 Archaeology: 32MO1040 Evaluation Project No. DPC-1-806(018)062	32MO1040	6984
1998	Lieb, J.		Testing and Evaluation of 32ML868 and 32ML869, Two Stone Ring Sites Located Southeast of Coal Lake in McLean County, ND	32ML868, 32ML869	7240
2000	Klinner, D.	G. Wermers	Evaluative Testing Program at Site 32OL122, Oliver County, ND UW #2161	32OL122	7585
2002	Klinner, D.	G. Wermers	McClusky Canal 2000 Evaluative Test Excavations at Archeological Sites 32BL144, 32BL145, 32BL175, 32ML896, 32ML899 and 32ML901, Burleigh and McLean Counties, ND	32BL144, 32BL145, 32BL175, 32ML896, 32ML899, 32ML901	9061
2003	Bales, J.	S. Wagers	Cultural Resources of the Falkirk Riverdale Third Increment, McLean County, ND	32ML1004, 32ML1005, 32ML1006, 32ML1007, 32ML1008, 32ML1009	8707
2005	Bleier, A.	D. Hiemstra	Verifications Locale South of Mandan: Evaluative Testing of 32MO1378, Morton County, ND	32MO1378	9058
2005	Butler, T.	T. Chadderton	Archaeological Evaluation of Sites 32MO300, 32MO1374, and 32MO1375 Square Butte Watershed Dam Site Number 6 Morton County, ND	32MO300, 32MO1374, 32MO1375	9124
2005	Bleier, A.	A. Kulevsky	Capital Electric's Substation: Evaluative Testing at 32BL538, Burleigh County, ND	32BL538	9132
2005	Klinner, D.	J. Morrison	Lincoln Lagoon Expansion Project: Results of a Class III Cultural Resource Inventory, and Evaluative Testing of Site 32BL543, Burleigh County, ND	32BL543	9170
2005	Stine, E.		Site 32OL371: Results from Evaluative Testing in Oliver County, ND	32OL371	9174
2005	Bleier, A.		Highway 1804: Evaluative Testing at 32BL233, Burleigh County, ND	32BL233	9178
2005	Peterson, L.	T. Parkins	NRHP Evaluation of 25 Prehistoric Sites in Permit Area NAFK-8405, McLean County, ND for the Falkirk Mining Company	32ME811	9307
2006	Peterson, L.	S. Hope	Falkirk: Testing and Evaluation of 14 Prehistoric Sites Located within the Northeast (6th) Addition, McLean County, ND	32ML1034- 32ML1047	9780
2006	Ahler, S.		Geophysical Survey and Test Excavation During 2005 at Boley Village (32MO37), Morton County, ND	32MO37	9836
2007	Stine, E.		Mor-Gran-Sou's Evaluative Testing at	32MO1365	9992

Year	First Author	Second Author	Title	Site Number	Ms #
			32MO1365 Morton County, ND		
2007	Mitchell, M.		Geophysical Survey and Test Excavation During 2006 at Larson Village, Burleigh County, ND	32BL9	10188
2008	Ferry, J.		Testing and Evaluation of Fourteen Prehistoric Sites near Hannover and Center, Oliver Co., ND	32OL317, 32OL369, 32OL370, 32OL396, 32OL397, 32OL399, 32OL400, 32OL450, 32OL464, 32OL465, 32OL466, 32OL467, 32OL468, 32OL469. 32OL470	10479
2008	Croll, K.	S. Larmore	Results of Archaeological Testing Big White Site (32ME4) Mercer Co., ND	32ME4	11045
2009	Broedel, R.	L. Peterson	Falkirk: Testing and Evaluation of 29 Sites Southwest of Underwood in McLean County, ND	32ML890, 32ML1055-32ML1081, 32ML1095	11025
2010	Peterson, L.	R. Broedel	BNI Coal: Cultural Resource Investigations in Mine Area C in Oliver County, ND	32OL497-32OL498, 32OL500-32OL509, 32OL519-32OL521, 32OL523, 32OL525-32OL529, 32OL531-32OL533, 32OL535, 32OL541, 32OL543-32OL545, 32OL547-32OL559, 32OL562-32OL571, 32OL573	11462
2011	Metcalf Archaeo-logical Consultants, Inc.		Final Report: Evaluation of 32SK1020 and 32OL427, in Stark and Oliver Counties, ND	32OL427	11556
2011	Martinson, R.	B. Fandrich	BNI Coal: A Class III Cultural Resource Inventory of 1,600 Acres and Testing of 13 Prehistoric Sites in Oliver County, ND	32OL322, 32OL601-32OL606, 32OL608-32OL609, 32OL611-32OL613	12146
2012	Fandrich, B.	L. Peterson	Testing and Evaluation of Site 32OL510, Oliver County, ND	32OL510	13102
2012	Toom, D.	M. Jackson	Elbee Site (32ME408) and Karishta Site (32ME466) 2010 Archeological Test Excavations Knife River Indian Villages National Historic Site, Mercer County, ND	32ME408, 32ME466	13440

Most of the early test excavation projects were directed toward gathering samples of artifacts from earthlodge village sites. Among the first were tests at Sakakawea (32ME11) and Lower Hidatsa (32ME10) in 1965 by Donald J. Lehmer (Lehmer et al. 1978; Wood 1986b:5). Wood (1986b:Table 1) briefly summarizes an array of testing activities at additional Plains Village sites in the Upper Knife-Heart region undertaken in 1968. A great deal of this work has been reported in the form of graduate student theses followed up by condensed articles in refereed journals (e.g., the 1969 testing at Lower Sanger [32OL12] on the Cross Ranch [Stoutamire 1973]).

Beginning in the mid-1970s, the tempo of testing intensified. As indicated in the listing, reporting upsurged beginning in 1978. Test excavation programs were linked to both large- and small-scale cultural resource projects. At the northern end of the SU, much of the reported work was undertaken within the KNRI and at the Cross Ranch. Prominent earthlodge villages including Sakakawea (Ahler et al. 1980), Lower Hidatsa (Ahler and Weston 1981), and Big Hidatsa (Ahler and Swenson 1985b) were tested. Other small Plains Village sites in the KNRI were the subject of inquiry in the late 1970s and early 1980s (Ahler 1984a, b; Ahler and Mehrer 1984; Ahler et al. 1983; Toom et al. 1985). Late Plains Woodland sites were investigated at Cross Ranch (Ahler et al. 1981, 1982). Limited testing at two earthlodge village sites (32OL9 and 32OL11) was reported by Rippeteau (1981).

Sites outside of the Trench received long-overdue attention, but this attention came at the expense of site destruction associated with more large-scale federally licensed undertakings. This included pioneering efforts with tipi rings (e.g., Deaver 1987; Deaver and Coutant 1984a; Good 1983; Good and Schreiner 1981; Good et al. 1982; Herbort and Anderson 1983; Kjos et al. 1983; Root et al. 1983).

The southern half of the SMRSU witnessed a variety of test excavations during this period. On-A-Slant (32MO26), a Heart River phase earthlodge village near the Missouri-Heart River confluence at the northern end of Fort Lincoln State Park, was tested in 1980 (Ahler 1997). During the next two years, numerous sites along the Northern Border Pipeline transect were tested (Root et al. 1983). One of the many significant Northern Border discoveries was a Middle Plains Woodland Sonota/Besant component at the Wounded Knee site (32EM21) (Root 1983v).

Since 1985, much test excavation work has centered on archeological resources within the area of potential effect of coal mining operations in the northwestern portion of the SMRSU. Stone circle sites are commonly the focus of this testing (cf. Deaver 1987). One example was in Falkirk Permit Area D, containing 32ML148 with 13 rings and 32ML270 with 14 rings and three cairns (Deaver and Coutant 1984b). Both sites were mapped, features were mapped and sampled with 1-x-1-m test excavation units, and ¼-inch screen recovery was employed. Testing at both sites encountered nothing but light-density deposits of chipped stone flaking debris (ca. two items/m^2). At 32ML270, two rings and one cairn were tested with five 1-x-1-m units. The sites were evaluated as not eligible for listing in the NRHP due to the paucity of artifacts encountered during testing. Portions of both sites were stripped with a grader after testing with an eye toward discovering and exposing cultural features with high artifact content, but results were negative. The sites were interpreted as representing casual and short-term utilization of the uplands by small scattered groups (ibid.). There was no evidence for possible cultural/temporal affiliation of either site. In some cases such as this where a site is to be destroyed in its entirety, shovel probes might be placed inside and outside all rings to insure that any large and distinct artifact concentrations are detected and salvaged.

In 1993, archeological and geoarcheological investigations were undertaken in the southern portion of 32EM72 (McKibbin et al. 1994). Site 32EM72, located on the east

shore of Lake Oahe and overseen by the USACE, has been eroded due to wave action. In addition to test excavations, project activities included soil coring, site mapping, cutbank profiling, and surface collection. Investigations identified eight cultural levels in the cutbank. Suggested date ranges are early Late Plains Archaic through the Late Plains Woodland (ibid.:24). The geoarcheological analysis aided in delineation of the horizontal extent of the site. Further, study of the cutbank revealed that the sedimentary origins of strata containing cultural materials were wind deposited during wet seasons and susceptible to erosion during dry seasons (ibid.:35; cf. Clayton et al. 1976).

A proposed materials pit necessitated test excavations at the Nelson site (32ML903) in 1998 (Morrison 1999b). Approximately 95% of the recovered artifacts consisted of debitage, only four pieces were not KRF. Investigators suggest the two identified components date to the Plains Archaic period but cannot be further distinguished based on recovered artifact samples.

During the summer of 2005, geophysical surveys and test excavations were conducted at Boley Village (32MO37). Boley is situated on a second terrace near the confluence of the Missouri River and Square Butte Creek (Ahler 2006:1). The site is identified as one of the traditional villages of the Mandan located in proximity to the mouth of the Heart River. Based on the artifact assemblage and radiocarbon dates, the area tested indicates occupations ranging from AD 1500s-1725 (ibid.:74). The geophysical survey included magnetic gradiometry and electrical resistance survey, supplemented and verified by systematic coring (ibid.:223). Investigators note, "Geophysical survey methods again proved a wonderful tool for exploring settlement structure on a broad scale as well as guiding pinpoint excavations with great efficiency" (ibid.:226). The geophysical survey and coring program revealed complex middens, two crisscrossing fortification ditches (in addition to the surface visible inner ditch), and numerous isolated pit features at the village margin.

The Larson Village (32BL9) was surveyed utilizing geophysical techniques followed by test excavations in 2006 (Mitchell 2007). The site is one of the traditional villages of the Mandan and was likely founded ca. AD 1500. This village, like Double Ditch State Historic Site, has four fortification systems with the outermost representing the founding community (Mitchell 2007:226). The combined use of geophysical techniques and traditional archeological excavation at this site, as well as others, have revealed the complex nature of the traditional Mandan villages near the Heart River, now believed to have been occupied for some 300 years.

A cultural material scatter site (32MO1365) was evaluated by excavating three 1-x-1-m test units and 60 shovel probes in a location proposed for a substation (Stine 2007). Recovered cultural materials include flakes, chipped stone tools, fire-cracked rock (FCR), bone fragments, and two projectile points. Based on the point fragments the site was thought to have occupied during the Archaic or Woodland period.

An entrance road (for employees and the public) for Leland Olds Power Station was proposed in 2007 (Croll and Larmore 2008). The entrance was planned to be located

at the north edge of 32ME4 (Alderin Creek). The site is a Plains Village earthlodge village. Limited testing was conducted in the project location consisting of shovel testing and a single 1-x-1-m excavation unit. Results of these investigations verified site deposits and features in the area and extended site boundaries 300 meters to the north.

Six lithic scatters and eight stone feature sites were tested in Oliver County for North American Coal Royalty Company (Ferry 2008). Four of the lithic scatters and two of the stone feature sites were recommended as eligible for listing in the NRHP.

Twenty-nine sites were tested to determine eligibility to the NRHP for Falkirk Mining Company (Broedel et al. 2009). This mine area is across the river from KNRI and Fort Clark State Historic Site. Nine of these sites in the mine area were recommended as eligible. Falkirk was able to avoid one site 32ML1064 (stone circle). The remaining eight sites (one cultural material scatter and seven stone feature sites) were recommended for mitigation.

Due to the proposed 8,595-acre expansion area of BNI Coal, 53 sites were tested to determine NRHP eligibility. Site types included stone rings, cairns, alignments, a cultural material scatter, and lithic scatters. Excavations occurred at a lithic scatter, a cultural material scatter, and in 205 stone rings and 28 cairns. Seventeen of these sites were recommended as eligible. According to Peterson and Broedel (2010:7.2):

> With the exception of 32OL544, all of the sites recommended NRHP eligible have demonstrated the potential to address questions associated with lithic technology. All but 32OL544, 32OL497, and 32OL498 have the potential to address questions associated with interior ring activities. Sites 32OL498, 32OL526, 32OL555, 32OL468, 32OL569 and 32OL573 have the potential to address questions associated with the use of flora. Sites 32OL498, 32OL544, 32OL554, 32OL555 and 32OL569 have the potential to address questions associated with faunal exploitation patterns. All recommended sites have potential to increase understanding of occupation periods in central North Dakota.

BNI Coal had 12 prehistoric sites (stone features) evaluated in 2010. Two of the sites (32OL601 and 32OL605) were recommended NRHP eligible since the presence of charcoal indicated the potential to place the sites in a temporal context and possibly address questions regarding floral exploitation (Martinson and Fandrich 2011:7.1).

Site 32OL510 was investigated to determine NRHP eligibility for BNI Coal (Fandrich and Peterson 2012). The site consists of three stone rings and a rock cluster along a ring wall. Excavations consisted of 5.27 square meters and the site was recommended eligible since the work demonstrated the site could be placed in a temporal context and address issues regarding the use of space within a domicile.

Excavations were conducted at two sites at KNRI in 2010 (Toom and Jackson 2012b). Karishta (32ME466) was determined to contain a near-surface deposit during the Late Plains Village period and thought to be similar to an area on the B terrace of Elbee. At Elbee (32ME408) excavations recovered Middle Plains Village deposits in the northern part of the A terrace village area and a probable Late Plains Village earthlodge in the southern part of the A terrace village area.

National Register of Historic Places

A large number of sites have been listed in the NRHP as a result of district nominations for the Knife River Indian Villages National Historic Site and the Cross Ranch. Three sites in this SU are National Historic Landmarks: Huff (32MO11), Menoken (32BL2), and Big Hidatsa (32ME12).

The current list of archeological sites in North Dakota listed in the NRHP is available on the NPS website. The following links are useful (NPS 20016a, b):

- General information and links to specific information: https://www.nps.gov/nr/
- National Register Information System: https://www.nps.gov/nr/research/

Major Excavation Projects

The SMRSU has witnessed more major excavations than any other SU (cf. Lehmer 1971:Appendix 1). Only the Garrison and Knife River SU rival this amount of major excavation. Because of the sheer volume of work and the immensity of significant results, a very brief outline is provided here focusing on highlights of these inquiries. Again, more details regarding these results are incorporated in the archeological context discussions below. Further, excellent summary works have been published by Lehmer (1971), Wood (1986), Ahler (1993), and Johnson (2007). As with test excavation projects, most of the early investigations concentrated on the major villages of the Plains Village period and mounds of the Plains Woodland period. More recently, large, impact-mitigating excavation projects have been directed at other types of properties such as stone feature sites. Table 5.5 lists manuscripts relating to excavation and salvage projects.

Prior to the earliest excavations listed, a number of pioneering archeologists dug at sites in the SMRSU. In 1896, J. V. Brower of the Minnesota Historical Society collected artifacts posited to have been ancestral Mandan near Bismarck (Brower 1904). George Will and Herbert Spinden were active in 1905 (Will and Spinden 1906). Work was carried out by Will (1924). During the late 1920s and early 1930s, two other archeologists were beginning to investigate sites in the Trench. Alfred W. Bowers (1930, 1948) conducted excavations at a number of Plains Village sites which he attributed to the Mandan or their ancestors. Some of William Duncan Strong's (1940) Northern Plains investigations pertain to lands within the SMRSU. Among the sites he excavated were On-A-Slant Village, Big Hidatsa, Lower Hidatsa, and Sakakawea Village.

Table 5.5: Major Excavation Projects in the Southern Missouri River Study Unit, 5 August 2015. Note: A number of these reports/publications are not located in the Archaeology and Historic Preservation Division (AHP) manuscript collection but are available in the AHP library.

Year	First Author	Second Author	Title	Site Number	Ms #
1906	Will, G.	H. Spinden	The Mandans: A Study of Their Culture, Archaeology and Language. Papers of the Peabody Museum of American Archaeology and Ethnology, Harvard University III (4).	32BL8	
1956	Woolworth, A.		Archeological Investigations at Site 32ME59 (Grandmother's Lodge). North Dakota History 23(2):70-102.	32ME59	
1958	Howard, J.		Report of the Investigation of the Tony Glas Site, 32EM3, Emmons County, ND	32EM3	11
1959	Howard, J.		Report of the Investigation of the Huff Site (32MO11), Morton County, ND.	32MO11	40
1960	Hartle, D.		Rock Village: An Ethnohistorical Approach to Hidatsa Archaeology. Ph.D. dissertation, Department of Anthropology, Columbia University.	32ME15	
1961	Wood, W.		The Huff Site, 32MO11, Oahe Reservoir Area, ND: 1960 Excavations	32MO11	41
1964	Wood, W.	A. Woolworth	The Paul Brave Site (32SI4), Oahe Reservoir Area, North Dakota. Bureau of American Ethnology, Bulletin 189, River Basin Surveys Papers 33.	32SI4	
1966	Lehmer, D.		The Fire Heart Creek Site. Smithsonian Institution, River Basin Surveys, Papers in Salvage Archeology 1.	32SI2	
1967	Wood, W.		An Interpretation of Mandan Culture History. Bureau of American Ethnology, Bulletin 198.	32MO11	
1968	Sperry, J.		The Shermer Site, 32EM10. Plains Anthropologist, Memoir 5, 13(42, Part 2).	32EM10	
1972	Smith, H.		Like-A-Fishhook Village and Fort Berthold, Garrison Reservoir, North Dakota. National Park Service, Anthropological Papers.	32ML2	
1972	Calabrese, F.		Cross Ranch: A Study of Variability in a Stable Cultural Tradition. Plains Anthropologist, Memoir 9.	32OL14	
1972	Dill, C.	F. Zimmerman	Lewis & Clark's Amahami Indian Village, Final Report National Endowment for the Humanities Youth Grant, Mercer County, ND	32ME8	31
1973	Lehmer, D.	L. Meston	Structural Details of a Middle Missouri House. Plains Anthropologist 18(60):160-166.	32OL16	
1973	Wood, W.	A. Johnson	High Butte, 32ME13: A Missouri Valley Woodland-Besant Site. Archaeology in Montana 14(3):35-83.	32ME13	
1975	Thiessen, T.		The Bendish Site (32MO2), Morton County, ND	32MO2	39
1976	Franke, N.		Double Ditch Salvage on May 27/May 28, 1976, Burleigh County, ND	32BL8	4242
1978	Ahler, S.		Archaeological Field Research in the Knife River Indian Villages National Historic Site, Summer 1978, Mercer County, ND	32ME11	304
1978	Lehmer, D.	W. Wood	The Knife River Phase. Report produced for the National Park Service, Interagency Archeological Services-Denver.	32ME15 32ML39 32ME8	
1978	Good, K.	J. Hauff	Archaeological Test Excavation at the Anderson Tipi Ring Site (32ML111), McLean County, ND: A Cultural Resource Study in Central ND	32ML111	552

Year	First Author	Second Author	Title	Site Number	Ms #
1980	Snortland, J.		Salvage of Cultural Resources Uncovered by the Ft. Clark Road Project (SHDSOS-1-086(01)000), Mercer County, ND	32ME2	1050
1980	Lee, C.		The Archeology of the White Buffalo Robe Site, Volume I, Mercer County, ND	32ME7	2526
1980	Lee, C.		The Archeology of the White Buffalo Robe Site, Vol. II, Appendices A-F, Mercer County, ND	32ME7	2527
1982	Sperry, J.		The Havens Site (32EM1) 1967 and 1968 Excavations, Emmons County, ND	32EM1	2553
1982	Ahler, S.		Progress Report Concerning Archeological Investigations at the Cross Ranch and in the Knife River Flint Quarry Area, Dunn County and Oliver County, ND	32OL148, 32OL144	2750
1983	Dill, C.	E. Holland	Fort Clark Research Reports, 2 Volumes	32ME2	3136
1983	Hudak, G.		Archeology of the Northern Border Pipeline, Beaver Creek: Volume 5, An Archeological Mitigation of the Beaver Creek Site, 32EM49, Emmons County, ND	32EM49	3459
1984	Griffin, D.		South Cannonball (32SI19): An Extended Middle Missouri Village in Southern North Dakota	32SI19	
1984	Dill, C.		Excavation of an Outhouse Pit, First and Thayer, Bismarck, Burleigh County, ND	No site number	3471
1985	Deaver, K.		Mitigation of the Anderson Tipi Ring Site (32ML111), McLean County, ND (3 volumes)	32ML111	3949
1986	Deaver, K.		Preliminary Report Mitigation of Site 32ML107	32ML107	4205
1986	Wood, W.		Papers in Northern Plains Prehistory and Ethnohistory: Ice Glider 32OL110. Special Publication of the South Dakota Archaeological Society, Number 10.	32OL110	
1987	Deaver, K.	S. Deaver	Dancing Grouse, A Tipi Ring Site in Central McLean County, ND Volume 1: Narrative	32ML107	4600
1988	Ahler, S.		Archeological Mitigation at Taylor Bluff Village (32ME366), Knife River Indian Villages National Historic Site	32ME366	4503
1992	Späth, C.		Stone Circle Site 32OL301, BNI Coal Center Mine, Oliver County, ND: Data Recovery	32OL301	5800
1994	Stine, E.		West River Telecommunications Excavation at 32ME787 Mercer County, ND	32ME787	6394
1995	Sperry, J.		The Havens Site (32EM1): 1967 & 1968 Excavations. Journal of the North Dakota Archaeological Association 6.	32EM1	
1995	Thiessen, T.		The Bendish Site (32MO2). Journal of the North Dakota Archaeological Association 6.	32MO2	
1996	Peterson, L		Data Recovery at a Stone Ring Site in the Southeast Island Permit Area, McLean County, ND	32ML867	7110
1997	Ahler, S.		Archaeology of the Mandan Indians at On-A-Slant Village (32MO26), Fort Abraham Lincoln State Park, Morton County, ND	32MO26	6920
1999	Wood, W.		The Tony Glas Site, 32EM3. North Dakota Archaeology: Journal of the North Dakota Archaeological Association 7.	32EM3	
2000	Ahler, S.	C. Graham	Report of Archaeological Investigations Along Highway 1806, Morton County, North Dakota	32MO291 32MO292 32MO335 32MO359	7617

Year	First Author	Second Author	Title	Site Number	Ms #
2000	Ahler, S.	K. Kvamme	New Geophysical and Archaeological Investigations at Huff Village State Historic Site (32MO11), Morton County, ND	32MO11	7683
2002	Ahler, S.		Prehistory on First Street NE The Archaeology of Scattered Village in Mandan, Morton County, ND	32MO31	8175
2003	Ahler, S.		Archaeology at Menoken Village, A Fortified Late Plains Woodland Community in Central ND, Burleigh County	32BL2	8475
2003	Hunt, W.	S. Ahler	Archeological Investigations at Fort Clark State Historic Site ND: 1973-2003 Studies at the Fort Clark and Primeau Trading Posts (32ME2)	32ME2	8530
2003	Ahler, S.		Archaeological Investigations During 2001 and 2002 at Double Ditch State Historic Site, Burleigh County, ND	32BL8	8719
2004	Ahler, S.		Archaeological Investigations During 2003 at Double Ditch State Historic Site, North Dakota	32BL8	
2004	Toom, D.	M. Jackson	Elbee Village Site (32ME408) 2003 Archeological Test Excavations Knife River Indian Villages National Historic Site Mercer County, ND	32ME408	9008
2005	Butler, T.	T. Chadderdon	Archaeological Mitigation of Site 32MO390 Square Butte Watershed Dam Site Number 6 Morton County, ND	32MO390	9141
2005	Ahler, S.		Archaeological Investigations During 2004 at Double Ditch State Historic Site, Burleigh County, ND	32BL8	9583
2006	Harvey, J.	J. Bennett	Cultural Resources Mitigation at 32MO296, 32MO306, 32MO1374, and 32MO1375 Morton County, ND	32MO296, 32MO306, 32MO1374, 32MO1375	9660
2006	Hope, S.	L. Peterson	Falkirk: Data Recovery at Five Prehistoric Sites in Permit Area NAFK-8405, McLean County, ND	32ML805, 32ML807, 32ML812, 32ML819, 32ML820	9882
2006	Hiemstra, D.	A. Kulevsky	Three Sites Overlooking Turtle Creek and the Missouri River: Archaeological Investigations at 32ML902, 32ML903, and 32ML914, McLean County, ND	32ML902, 32ML903, 32ML914	11247
2007	Strait, J.	L. Peterson	Falkirk: Mitigation and Environmental Reconstruction of the Northeast (6th) Addition, McLean County, ND	32ML1039	10186
2010	Thomas, J.	L. Peterson	Falkirk Mining Company: Data Recovery of 12 Sites in McLean County, ND	32ML890, 32ML1057, 32ML1058, 32ML1060, 32ML1062, 32ML1065, 32ML1067, 32ML1069, 32ML1071, 32ML1073, 32ML1079, 32ML1095	11688
2011	Peterson, L.	J. Thomas	BNI Coal: Data Recovery at Three Prehistoric Archaeological Sites in Oliver County, ND	32OL531, 32OL541, 32OL549	12269
2013	Kuntz, P.	L. Peterson	Falkirk: Data Recovery at 32ML823, A Prehistoric Stone Ring Site in McLean County, ND	32ML823	14456

Year	First Author	Second Author	Title	Site Number	Ms #
2013	Mitchell, M.		Archaeological, Geoarchaeological, and Geophysical Investigations During 2008 at Chief Looking's Village, Burleigh County, North Dakota	32BL3	15377
2014	Mitchell, M.		Archaeological and Geophysical Investigations During 2012 at Fort Clark State Historic Site, Mercer County, North Dakota	32ME2	15194

Shortly thereafter, Thad Hecker was the first to excavate a long rectangular Plains Village house in 1938-1939 at Huff (32MO11) (Wood 1967:28). Later excavations were carried out at this North Dakota State Historic Site in 1959-1960 (Wood 1961). The two decades following the end of WWII saw the expansion of large-scale salvage excavations at sites soon to be inundated by rising reservoir pools. Many of these projects were undertaken by SIRBS personnel along with archeologists from at least 10 other institutions (Lehmer 1971:193; Thiessen 1999) and are indicated in the tabular listing. Lehmer presented the major synthesis of the results of this salvage work in his *Introduction to Middle Missouri Archeology.* More recently, Ahler (1993) presents a synthesis and working model for the taxonomic framework of the Plains Village tradition in the upper Knife-Heart region of the Middle Missouri subarea. In addition, Johnson (2007) reviews and presents new information regarding the chronology of Middle Missouri Plains Village sites.

Other references include Johnson (1998:308-344), Wedel (1961:156-209), Winham and Calabrese (1998:269-307), and Winham and Lueck (1994:149-175) that provide chapter summaries of regional archeology. The Ahler and Kay edited volume (2007) on Plains Village archeology presents more recent summaries covering topics in Middle Missouri archeology. Mitchell (2013) and Fenn (2014) review the political economy and history of the Mandans in the Heart River region from AD 1400 -1800s. Additionally Wood et al. (2011) document Fort Clark Trading Post and its accompanying Mandan and Arikara Village between 1822 and 1860. Hollenback (2012) investigates responses to smallpox epidemics among the Hidatsas as it relates to pottery technology. This "disaster archeology" paradigm follows up on the work of Richard Gould (2007) and others from a world-wide perspective.

Plains Woodland burial mounds were investigated by major excavations in the 1960s. Henning (1965) reported on Alkire Mound (32SI200) and Neuman (1975) discusses Boundary Mound (32SI1) and Schmidt Mound (32MO20).

From 1980 to 1989, only two major excavations were undertaken at Plains Village sites in the valley. Lee (1980) coordinated the reporting for the multiple component White Buffalo Robe site (32ME7). Excavations at Taylor Bluff Village (32ME366) are reported by Ahler (1988). In contrast, large-scale mitigation projects have taken place at three stone circle sites outside of the valley at 32OL270 (Fredlund et al. 1984), Anderson Tipi Ring site (32ML111) (Deaver 1985), and Dancing Grouse (32ML107) (Deaver and Deaver 1987).

Dancing Grouse (32ML107) is a tipi ring site covering approximately nine hectares (22.2 acres) on three small ridges overlooking Coal Lake Coulee. It has around 50 rings, and excavations were conducted at 11 of those plus two non-feature areas, totaling 421 m^2. Circular units were used. Soil phosphate testing and phytolith testing were employed. There are posited to have been at least seven Besant ring occupations dating 1041-1212 RCYBP (ca. AD 700-900). This site is across the coulee from 32ML111, the Anderson Tipi Ring site, and also near 32ML112, the Pulver Mound State Historic Site.

Since the 1990s, major excavation projects have been reported for several Plains Village sites along the Missouri River. Additionally, as documented, there have been more geophysical surveys at archeological sites in the SMRSU than in any other SU. The following discussion briefly mentions some salient issues of the investigations. The reader is directed to the referenced materials for detailed discussions of the research and findings.

On-A-Slant Village (32MO26), a Mandan earthlodge village near the mouth of the Heart River, is located within the boundaries of the present-day Fort Abraham Lincoln State Park. Analysis of excavations in 1980 reveals site occupation dating ca. AD 1575-1785. Changes in the artifact assemblage show how village occupants adapted to the rapidly changing cultural dynamics along the Missouri River. These changes included: (1) simpler ceramic decorative techniques and an increase in Knife River ware; (2) a reliance on local lithic resources; and (3) a more complex subsistence strategy comprising a wider variety of cultigens and wild plants and more emphasis on alternative resources other than bison, such as medium-sized mammals (e.g., deer and pronghorn antelope), fish, river mussels, and fur-bearing animals (Ahler 1997:ii).

During the field seasons of 1996 and 1997, archeologists undertook monitoring of a transportation project on ND Highway 1806 near the confluence of the Heart and Missouri rivers. Known prehistoric sites included 32MO291, 32MO292, 32MO335, 32MO359, and 32MO1043 (Ahler et al. 2000). Truncated occupation surfaces with the basal portions of pits were exposed and salvaged at these sites. In fact, 124 cultural features were salvaged at these sites contributing valuable information of Plains Village life in the Heart River region. Numerous radiocarbon dates indicate site 32MO291 was occupied from AD 1415-1460. Site 32MO292 is near the earthlodge village 32MO27 and based on artifact content in features may represent gardening activities, cooking or animal processing along Beaver Creek. Site 32MO335 is adjacent to the Motsiff village site where three of the 10 features contained human remains. Site 32MO359 is also adjacent to the Motsiff site and is probably an outlier of that village.

Investigations at Huff Village (32MO11) have focused on archeological research supplemented by geophysical investigations (Ahler and Kvamme 2000). Fieldwork included geophysical survey (magnetometer survey and electrical resistance), systematic coring, and excavation. Upon project completion researchers concluded, “[W]e can note that this geophysical study is a very important test case and pilot study in the application of such methods in Plains Village settings. We have gained much new technical

information about the interpretation of magnetic and resistance anomalies that can readily be extended to old data sets and new archeological contexts" (ibid.:118). All of the methods incorporated into the investigation at Huff increased the knowledge base regarding the arrangement of the settlement and the architecture within it. Moreover, acquisition of six radiocarbon dates from charred corn and corncob allowed researchers to narrow the range of occupation to AD 1443-1465 (ibid.:65).

The Scattered Village site (32MO31), located in downtown Mandan, was uncovered during a transportation project with federal funding. Objectives of the excavation included: (1) the emergency salvage program, (2) determination of cultural affiliation, (3) determination of the site's relationship to oral traditions, (4) chronological placement of the site, (5) tracking cultural and technological change over time, and (6) clear presentation of data for future comparative study and public education (Ahler 2002:ii). As reported, either a Mandan or Hidatsa cultural affiliation is consistent with oral traditions and the ceramic assemblage. Radiocarbon dates and Euro-American trade items provide an approximate date range of late AD 1500s-1700 (ibid.).

Since archeologists began re-investigating Double Ditch State Historic Site (32BL8) in 2001, several volumes of research and analyses have been produced (Ahler 2003b, 2004, 2005). The multi-year, multi-disciplinary project includes four seasons of geophysical surveys (Kvamme 2004), a limited subsurface coring program, and three summers of excavation. The geophysical surveys, including magnetometry and resistivity methods, revealed the subsurface presence of Ditches 3 and 4, fortification systems previously not known to archeologists. Fieldwork in 2001-2002 included: (1) re-excavation of early 20th century excavations, (2) sampling and dating of Mound B, (3) cross-sectioning and dating of Ditches 3 and 4, (4) sampling and dating of pit features at the village periphery, and (5) cross-sectioning of a house feature (Ahler 2003b:261). Continuing in 2003, project activities included: (1) deep testing of 13 mounds in proximity to Ditch 2, (2) cross-sectioning Ditch 4, and (3) sampling and dating deposits at a potential rectangular house location (Ahler 2004:315). Finally, tasks of the 2004 field season included: (1) excavation of pit features at the center and periphery of the village, (2) determination of the subsurface shapes of Ditch 2 through coring and Ditch 4 by excavation, (3) excavation of the "zone of obliteration" outside Ditch 2, and (4) elucidation on the differences between house depressions and large borrow areas within the confines of Ditch 2 (Ahler 2005:327). The site was occupied from AD 1490-1785, have been delineated for the site through analysis of the artifact assemblage and numerous radiocarbon dates (ibid.:329). Combining traditional excavation techniques with newer technologies have allowed archeologists to dramatically alter their interpretations of Double Ditch State Historic Site (Ahler and Geib 2007:442-451; Kvamme 2007:210-221; Kvamme and Ahler 2007:539-561).

In 1964, Menoken Village (32BL2) was designated as a National Historic Landmark based on the assumption that it was the location of initial contact between Euro-Americans and the Mandan. Recent radiocarbon dating has disproved that assumption and revealed that the site actually was occupied ca. AD 1200 (Ahler 2003a:565). Located along Apple Creek, Menoken Indian Village State Historic Site

(32BL2) is smaller than other fortified earthlodge villages but recent archeological investigations and geophysical surveys have provided substantial information concerning the transition from the Late Woodland period to the Plains Village period (ibid.:574). It appears the 200 or so occupants of Menoken Village were hunter-gatherers who lived a semi-sedentary lifeway (ibid.:574). As Ahler succinctly writes, "It is clear that Menoken Village is a very unusual archeological location, documenting what was perhaps the climax of a semi-sedentary hunting-gathering tradition on the Northern Great Plains" (ibid.:575). The results of the 1998 and 1999 investigations at Menoken have more recently been published in Ahler (2007:15-31), Krause (2007:32-40), and Kvamme (2007:210-221).

Hunt (2003) and Ahler (2003) review and analyze intermittent investigations at the Fort Clark State Historic Site (32ME2) from 1973-2001. The site includes two historic fur trade posts (Primeau's Post and Fort Clark) and archeological remnants of Mandan (AD 1822-1837) and Arikara (AD 1838-1861) earthlodge villages (ibid.:1). As with other village sites, geophysical surveys have played a significant role in creating a more detailed picture of the site using relatively non-invasive procedures (Kvamme 2001; Kvamme 2007:210-221). A recent synthesis of Fort Clark investigations is found in Wood et al. (2011).

In 2003, archeological excavations and geophysical surveys were conducted in the northern portion of the Elbee site (32ME408) within the KNRI (Toom et al. 2004). Recovered artifacts were contained within the plow zone and subsurface features located by geophysical survey (e.g., pits and hearths) (ibid.:6.1). Investigators suggest these features are associated with house remains whose surficial signatures have been destroyed by agricultural activities. The northern portion of the Elbee site, consisting of a single Plains Village component, has been radiocarbon dated to the mid-AD 1500s (Scattered Village complex) (ibid.). Going forward, investigators encourage archeological and geophysical examination of the southern portion of the site.

Site 32MO390 was discovered during construction of the Square Butte Watershed Dam Site Number 6, north of Otter Creek. Archeological fieldwork included pedestrian survey, geomorphological assessment of the creek valley, geophysical survey, and excavation. The multi-component site dates to the Early Plains Village and Late Plains Village periods, with an unknown date for the buried component in the A1 horizon (Butler and Chadderon 2005:i). Investigators suggest that 32MO390 may have been a field camp or processing site related to larger village sites (32MO40 and 32MO41) in the area (ibid.).

Other sites mitigated due to the proposed construction of Square Butte Watershed Dam include 32MO296, 32MO306, 32MO1374, and 32MO1375. These sites were short term prehistoric resource extraction sites and campsites dating to the Early to Middle Plains Archaic, Late Plains Archaic, Early Plains Woodland, Middle Plains Woodland, and Late Plains Woodland (Harvey et al. 2006).

Paleo, Early Archaic, and Middle Archaic components were documented at 32ML902, 32ML903, and 32ML914. Alberta-Cody, Cody, and possibly Hell Gap complexes were represented at 32ML903/32ML914. Mitigation revealed that 32ML903 and 32ML914 represent a single site and the site designation 32ML914 was retained. Intact Paleo deposits still remain on the portion of the site originally recorded as 32ML914. Early Archaic deposits were present at 32ML903/914 and 76 features (hearths, bone concentrations, flake concentrations, and caches) were excavated. A Middle Archaic component was also present at 32ML903/914. Less dense Paleo to Late Archaic deposits were present at site 32ML902 (Hiemstra et al. 2006).

Multiple mitigation programs were undertaken by Falkirk Mining Company from 2006-2013. Early Archaic, Middle Archaic, Plains Woodland, and Plains Village traditions were identified at 32ML805 (stone circle), 32ML807 (stone circle), 32ML812 (lithic scatter), 32ML819 (cairn), and 32ML820 (stone circle) (Hope and Peterson 2006). A Late Woodland occupation was identified at 32ML1039 (cairn) and along with this a soil core at the pothole pond provided information regarding climatic conditions over the past 18,000 years in central North Dakota (Strait and Peterson 2007). Data recovery was conducted at an additional 12 sites consisting of two lithic scatters (32ML1062, 32ML1095), a cultural material scatter (32ML890), and nine stone feature sites (32ML1057-1058, 32ML1060, 32ML1065, 32ML1067, 32ML1069, 32ML1071, 32ML1073, 32ML1079). Components dating to the Archaic, Plains Woodland, and Plains Village traditions were represented at these sites (Thomas and Peterson 2010). A Besant complex stone ring site (32ML823) was mitigated by excavating two ring features (Kuntz et al. 2013b). Both ring features had hearths and had similar interior spatial organization despite the time difference of many generations.

BNI Coal was expanding its mining operations and thus data recovery involved excavating16 stone ring features (completely or in part) at three sites. The sites consisted of 32OL531, 32OL541, 32OL549 (Peterson and Thomas 2011). Middle/Late Woodland and Plains Village components were represented. Excavations enabled the study of patterns of activities within the interior of structures. In addition, sampling of non-feature related macroflora revealed sufficient charcoal to allow radiocarbon analysis which opens up possibilities of determining periods of occupation at numerous other sites in the future.

Research continued in the Heart River Region centering on traditional Mandan sites. Excavations at Chief Looking's Village (32BL3, formerly Ward Village) employed the same strategies and techniques as at Double Ditch, Boley, and Larson. Of particular interest at Chief Looking's was that it was occupied for a much shorter time (approximately 25 years) and was considerably smaller than these other traditional Mandan sites. Both rectangular lodges and earthlodges are present at the site and this provides an opportunity to look at changes in architecture and use of space over a relatively brief period of time. Fieldwork consisted of a magnetometer survey, systematic coring effort, followed by excavation (Mitchell 2013).

Geophysical surveys previously identified a 11-m long and 7.5-m wide structure and raised the possibility that this might be the remains of Fort Clark I, built in 1824.

Excavations in 2012 targeted this location. Excavations combined with historic documents clearly indicated this structure was not built in 1824 but rather was likely built between 1850 and 1855. It was likely a cabin occupied by an Arikara household during the community's final decade. In addition, excavations below the structure's floor exposed post molds and a large central hearth from one or two preexisting earthlodges (Mitchell 2014).

Stone Circle and Cairn Sites

Over five hundred stone circle sites have been identified during surveys (see Table 5.3) in this SU. As can be seen from the above testing and excavation discussion and Tables 5.4 and 5.5 many stone ring sites have been investigated. For sites to be listed in this table there had to be formal testing, meaning at least one 1-x-1-m was excavated at the site. During mitigation entire stone circles were excavated at several sites enabling research on spatial use in domicile structures. These excavations undertaken due to expanding mine areas provide a wealth of information regarding a common site type in North Dakota. Review of the literature reveals the changing research questions addressed over time for this feature type. Table 5.6 was developed so that a list of excavated sites would be readily available for researchers.

The monograph on ring sites in *Plains Anthropologist Memoir 19* is a valuable source of information (Davis 1983). Compilations of radiocarbon dates from sites in McLean, Mercer, and Oliver counties can be found in Strait and Peterson (2007:4.6-4.8), in McLean County (Thomas and Peterson 2010:6.2-6.3) and from Besant/Sonota sites in Deaver and Deaver (1987). A useful discussion of single ring site function based on ethnographic accounts is available in Gregg et al. (1983:[3]864-869). An assessment of nomadic settlement-subsistence structure and bison ecology is discussed by Hanson (1983:1342-1417). Additional references for stone feature sites can be found in the references section of the Cultural Heritage Form.

Nearly two hundred cairn sites have also been identified in this SU. Cairns are likewise a common site type in the SU. Suggested uses of cairns include marking the location of an event, travel routes, bracing poles for a variety of camp structures, caches, drive lines, or covering a burial.

Table 5.6: Formally Tested or Excavated Stone Feature Sites in the Southern Missouri River Study Unit, 5 August 2015.

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	Ms #
32BL35	Circle	Inside	No			2848
32BL144	Circle	Inside	Yes			9061
32BL145	Circle		No			9061
32BL175	Circle	Inside	Yes			9061
32EM18	Circles Cairns	Inside, Outside Inside	Yes Yes			2564, 3456
32EM22	Circles	Inside, Outside	Yes			2564,

						3456
32EM23	Circles Cairn	Inside, Outside Inside	Yes Yes	Location of cairns may indicate they were used to support racks outside stone circle		2564, 3456
32EM24	Circles	Inside, Outside	Yes			2564, 3456
32EM25	Circles Cairns	Inside, Outside Inside	Yes Yes			2564, 3456
32EM44	Circles	Inside, Outside	Yes	Firepit	Mean uncorrected (2 samples) 790BC±70	3456
32EM57	Circle	Inside, Outside	Yes			3456
32EM59	Circle Cairn	Inside Inside	Yes Yes	1 stone circle & 2 cairns (Red Ochre Burial Site) F2 – large cairn with bone and red ochre so no further disturbance	Plains Village	3456
32EM60	Circle Cairn	Inside Inside	Yes Yes	Rock Cairn burials, 5 rings, 2 large cairns, 1 small cairn		3456
32EM61	Circles Cairns	Inside, Outside Inside	Yes Yes	14 stone circles & 13 cairns Secondary burial in small pit covered by rock. Within view of 32EM7	Extended Middle Missouri	3456**
32EM62	Circles Cairn	Inside, Outside Inside	Yes Yes	One small stone ring may be a storage facility.		3456
32EM106	Circles Cairns	Inside, Outside	Yes	Hearth present	Late Prehistoric, multicomponent. F23 ring AD710 from hearth	3456
32EM107	Circles	Inside	Yes			3456
32ML107	Circles	Inside, Outside	Yes	Dancing Grouse	Archaic (3600BP-2599BP); Besant (1041BP-1212BP); 626 BP	3944, 4205, 4600
32ML108	Circles	Inside, Outside	Yes			2542
32ML109	Cairn	Inside	No			2542
32ML110	Cairn	Inside	Yes			3944
32ML111	Circles Cairns	Inside, Outside Inside	Yes Yes	Numerous radiocarbon dates and TL dates	Middle Archaic Besant (mostly) Avonlea Plains Village	552, 3949
32ML144	Circle	Inside	Yes			3120
32ML148	Circle	Inside, Outside	Yes			3120, 4610
32ML152	Circle	Inside	Yes			3120, 3365
32ML153	Circle	Inside	No			3120
32ML159	Circle	Inside	No			3120
32ML160	Circle	Inside	No			3120
32ML210	Circle Cairn	Inside Inside	Yes Yes (?)			3944
32ML265	Circle	Inside	Yes			4663
32ML270	Circle Cairn	Inside Inside	Yes Yes			4610
32ML805	Circles	Inside	Yes		Pelican Lake Late Prehistoric	9882
32ML807	Circles	Inside	Yes		Middle/Late Archaic	9882

					Late Woodland	
32ML819	Cairn	Inside	Yes	Bone & CSFD	AD 1210-1290	9882
32ML820	Circles	Inside	Yes	CST & Pottery	Besant Late Woodland/Plains Village	9882
32ML823	Circles	Inside	Yes	Hearth	Besant	14456
32ML867	Circles	Inside	Yes	Summer occupation	Plains Village (AD 1430-1655)	7110
32ML872	Circles Cairn	Inside Inside	Yes Yes	Food production (bone concentration) – large mammal	Besant 100BC – AD65	6687
32ML896	Circle	Inside, Outside	Yes, No			9061
32ML899	Circle	Inside, Outside	Yes, No			9061
32ML901	Circle	Inside	Yes			9061
32ML1034	Circle	Inside	No			9780
32ML1035	Circle	Inside	Yes			9780
32ML1036	Circle	Inside	Yes			9780
32ML1037	Circle	Inside	Yes		Late Prehistoric	9780
32ML1038	Circle	Inside	Yes			9780
32ML1039	Cairn	Inside	Yes	Pottery	Late Woodland	9780, 10186
32ML1040	Cairn	Inside	Yes	Bone – med sized mammal		9780
32ML1041	Circle Cairn	Inside Inside	Yes Yes		Pelican Lake	9780
32ML1042	Circle Cairn	Inside Inside	Yes Yes			9780
32ML1043	Circle	Inside	Yes	Obsidian flake		9780
32ML1044	Circle	Inside	Yes			9780
32ML1045	Circle	Inside	Yes	Stone-lined depression, flakes, mid-sized mammal (maybe a looted cairn)		9780
32ML1046	Circle	Inside	No			9780
32ML1047	Cairn	Inside	Yes			9780
32ML1055	Cairn	Inside	No			11025
32ML1056	Circle	Inside	Yes			11025
32ML1057	Cairn	Inside	Yes	Bison calf	Historic	11025, 11688
32ML1058	Circle	Inside	Yes			11025, 11688
32ML1059	Circle	Inside	No			11025
32ML1060	Circle	Inside	Yes	Possible hearth		11025, 11688
32ML1061	Circle	Inside	Yes			11025
32ML1063	Circle	Inside	Yes			11025
32ML1064	Circle Cairn	Inside Inside	Yes Yes			11025
32ML1065	Circle	Inside	Yes	Pottery	Middle Plains Archaic Plains Village (possibly Nailati phase)	11025, 11688
32ML1066	Cairn	Inside	No			11025
32ML1067	Circle	Inside	Yes		McKean	11025, 11688
32ML1069	Circle	Inside	Yes		Possibly Plains Village	11025,

						11688
32ML1070	Circle	Inside	No			11025
32ML1071	Circle	Inside	Yes		Hanna	11025, 11688
32ML1072	Circle	Inside	Yes			11025
32ML1073	Circle Cairn	Inside Inside	Yes Yes	Late summer/fall occupation	Plains Village (Clarks Creek or Nailati)	11025, 11688
32ML1074	Cairn	Inside	No			11025
32ML1075	Circle	Inside	Yes			11025
32ML1076	Circle	Inside	No			11025
32ML1077	Circle Cairn	Inside Inside	No Yes			11025
32ML1078	Circle	Inside	No			11025
32ML1079	Circle	Inside	Yes	Ceramics (Sanger/LeBeau)	Plains Village (Hidatsa)	11025, 11688
32ML1080	Circle	Inside	No			11025
32ML1081	Circle	Inside	No			11025
32MO78	Circle Cairn	Inside, Outside Inside	Yes/Yes No	Hearth in ring (17 rings a single occupation)	Archaic or Woodland	3456
32MO256	Circle	Inside, Outside	Yes/Yes	Short term occupation – nuclear/stem family		3456
32OL116	Circle	Inside, Outside	Yes/No			307
32OL118	Circle	Inside	Yes			307
32OL119	Circle	Inside	Yes			307
32OL121	Circle	Inside	Yes			307
32OL122	Circle	Inside	Yes			307, 7585
32OL123	Circle	Inside	Yes			307
32OL124	Circle	Inside	No			307
32OL173	Cairn	Inside, Outside	Yes/Yes			3668
32OL178	Rock Effigy	Inside, Outside	Yes/Yes		?Late Woodland	3668
32OL179	Cairn	Inside	Yes	1 fragment of human bone with flakes, FCR, animal bone, CS Tools		3669
32OL207	Circle	Inside	Yes			2481, 2559
32OL209	Circle Cairn	Inside, Outside Inside	Yes Yes			2893
32OL210	Circle	Inside, Outside	Yes/Yes			2481, 2559
32OL242	Circle Cairns	Inside, Outside Inside	Yes/Yes Yes	Cairn on possible burial mound	AD 1620 $\pm$ 80	3233, 3132
32OL260	Cairn	Inside, Outside	No/Yes			3669
32OL261	Cairn	Inside, Outside	Yes/Yes			3669
32OL263	Circle Cairn	Inside, Outside Inside	Yes Yes			2893
32OL264	Cairn	Inside, Outside	Yes/Yes			2893
32OL265	Cairn	Inside, Outside	Yes/Yes			2481, 2559
32OL267	Circle	Inside	Yes	Hearth	AD 545 $\pm$ 65	3132, 3233
32OL269	Circle	Inside/Outside	Yes/Yes			3132, 3233

32OL270	Circle	Inside/Outside	Yes	Lithic procurement, living floor structure		3132, 3233, 3246
32OL282	Circle Cairn	Inside Inside	No Yes			4104
32OL289	Cairn	Inside	Yes			4104
32OL298	Circle Cairn	Inside Inside	No No			5033
32OL300	Cairn	Inside	No			5033
32OL301	Circle	Inside, Outside	Yes/Yes		Middle Plains Archaic, Plains Village	5033, 5800
32OL302	Circle	Inside	No			5033
32OL303	Circle	Outside	Yes	Probes inside circles also had cultural material but there were no formal units placed in rings		5033
32OL304	Circle	Inside	No			5033
32OL308	Circle	Inside	Yes			5033
32OL322	Circle	Inside	No			12146
32OL338	Circle	Inside	Yes			6940
32OL396	Circle	Inside	Yes			10479
32OL397	Circle Cairn	Inside Inside	Yes Yes			10479
32OL399	Circle Cairn	Inside Inside	No No			10479
32OL400	Circle	Inside	Yes			10479
32OL464	Cairn	Inside	No			10479
32OL468	Circle	Inside	Yes			10479
32OL470	Circle Cairn	Inside Inside	Yes No			10479
32OL500	Circle	Inside	Yes			11462
32OL501	Circle	Inside	Yes			11462
32OL502	Circle	Inside	Yes			11462
32OL503	Circle	Inside	Yes			11462
32OL504	Circle	Inside	Yes			11462
32OL505	Circle	Inside	Yes			11462
32OL506	Circle	Inside	Yes			11462
32OL507	Cairn	Inside	Yes			11462
32OL508	Circle	Inside	Yes			11462
32OL509	Circle	Inside	Yes			11462
32OL510	Circle Cairn	Inside Inside	Yes Yes			13102
32OL520	Circle	Inside	Yes			11462
32OL521	Circle	Inside	No			11462
32OL523	Cairn	Inside	No			11462
32OL525	Circle	Inside	No			11462
32OL526	Circle	Inside	Yes	Obsidian		11462
32OL527	Circle	Inside	Yes			11462
32OL528	Circle	Inside	Yes			11462
32OL529	Circle	Inside	Yes			11462
32OL531	Circle Cairn	Inside Inside	Yes Yes	Obsidian Cairn maybe modern	Pelican Lake Besant (AD260-280; AD 330-420, AD 400-450, AD 615-665) Plains Village (Clark's	11462, 12269

					Creek) AD 1235-1245 or 1250-1285 - Hidatsa	
32OL532	Circle Cairn	Inside Inside	No Yes			11462
32OL533	Circle	Inside	Yes			11462
32OL541	Circle Cairn ORF	Inside, Outside Inside Inside	Yes Yes Yes	Hearth, obsidian	Besant Plains Village (AD 1315-1355; 1385-1415)	11462, 12269
32OL543	Circle	Inside	Yes			11462
32OL544	Cairn	Inside	Yes			11462
32OL545	Circle Cairn	Inside Inside	Yes Yes			11462
32OL547	Circle	Inside	Yes			11462
32OL548	Circle	Inside	Yes			11462
32OL549	Circle	Inside	Yes			11462, 12269
32OL550	Circle Cairn	Inside Inside	Yes Yes			11462
32OL551	Circle	Inside	Yes			11462
32OL552	Circle Cairn	Inside Inside	Yes Yes			11462
32OL553	Cairn	Inside	Yes			11462
32OL554	Circle Cairn	Inside Inside	Yes Yes			11462
32OL555	Circle Cairn	Inside Inside	Yes Yes	Hearth, obsidian	McKean/Besant	11462
32OL556	Circle	Inside	Yes			11462
32OL557	Cairn	Inside	Yes			11462
32OL558	Circle Cairn	Inside Inside	Yes No			11462
32OL559	Circle	Inside	Yes			11462
32OL562	Circle Cairn	Inside Inside	Yes Yes			11462
32OL564	Circle	Inside	Yes			11462
32OL565	Cairn	Inside	No			11462
32OL566	Circle Cairn	Inside Inside	Yes Yes			11462
32OL567	Circle	Inside	No			11462
32OL568	Circle	Inside	Yes			11462
32OL569	Circle	Inside	Yes			11462
32OL570	Cairn	Inside	Yes			11462
32OL571	Circle	Inside	Yes			11462
32OL573	Circle	Inside	Yes			11462
32OL601	Cairn	Inside	Yes	Charcoal		12146
32OL602	Cairn	Inside	Yes			12146
32OL603	Cairn	Inside	No			12146
32OL604	Cairn	Inside	No			12146
32OL605	Cairn	Inside	Yes	Charcoal		12146
32OL606	Cairn	Inside	No			12146
32OL608	Circle	Inside	No			12146
32OL609	Circle	Inside	No			12146
32OL611	Circle	Inside	Yes			12146

32OL612	Circle	Inside	Yes			12146
32OL613	Circle Cairn	Inside Inside	Yes No			12146
32SH178	Circle	Inside	Yes			2848
32SH181	Circle	Inside	No			2848
32SH187	Circle	Inside	Yes			2848
32SH191	Circle	Inside	No			2848

Other Work

The dramatic ethnohistory of the SMRSU has been captured in the journals of early explorers, trappers, and traders. The first to leave a written record was La Verendrye (Smith 1980). Others include John Evans and James McKay from 1795-1797 and David Thompson in 1798 (Wood 1977, 1981, 2003; Wood and Thiessen 1985).

The most famous early visitors to the SMRSU after the turn of the 18th century were Lewis and Clark (Jenkinson 2003; Moulton 1983-2001, vol. 1-13; Reid 1988). During the next half century, a host of notable characters made their way to the Upper Missouri. Fortunately, artists Karl Bodmer and George Catlin captured some of the essence of this country and its native peoples.

Paleo-Indian Period

The Paleo period designates the time of initial peopling of the area sometime after 9500 BC following recession of Wisconsinan glaciation. Paleo hunting and gathering adaptations essentially are unknown here as they are in most other parts of the state.

Paleo-Environmental Modeling

Clayton and Moran (1981) provide a late glacial chronology for portions of the Northern Plains including the SMRSU. Wisconsinan glaciers advanced and retreated several times between about 20,000 and 9500 years BP. The vast majority of the SMRSU was free of glacial ice after ca. 12,300 BP. The Missouri River, flowing in a glacial meltwater channel, drained southward during that time as it does now. The pothole country as well as the knob and kettle terrain of the Coteau was the result of ice advancement, stagnation, and meltdown.

The climatic episode during terminal glacial times is identified as the Boreal. Following the recession of the ice front, the landscape was dominated by spruce-aspen forests and wetlands. Investigations indicate that intact paleosurfaces of Paleo age occur in buried terrace settings within the Trench. Toom (1988:Table 3) reported two dates exhibiting a weighted average of 9940±70 BP for sediments interpreted as representing the basal member of the Leonard paleosol of the Oahe Formation (cf. Clayton et al. 1976) at the Flaming Arrow site (32ML4) near Washburn, North Dakota. The existence of these buried landscapes indicates that paleo-environmental modeling can be enhanced in the SMRSU with appropriate study. Pollen, plant microfossil, and other floral and faunal data ought to be recoverable to permit more detailed climatic and environmental

reconstructions. A soil core at the pothole pond near 32ML1039 provided information regarding climatic conditions for the past 18,000 in that area (Strait and Peterson 2007).

Cultural Chronology

There is not yet any basis for putting forth a Paleo chronology for the SMRSU which is any different from that of the statewide chronological model. Schneider (1983) summarized early information for finds of Paleo points from North Dakota. Ahler and others provide detailed information on Folsom and other Paleo points in the Missouri River Valley in the New Town area (Ahler et al. 2002:69-112). Site 32ML903/914 has Alberta-Cody, Cody, and possibly Hell Gap components represented. Late Paleo deposits are present at site 32ML902(ibid.). Intact Paleo deposits still remain at this site (Hiemstra et al. 2006). Specimens have been reportedly found in Mercer, Oliver, Morton, and Sioux counties on the west bank of the Missouri River and McLean, Burleigh, Emmons, and Kidder counties east of the river within the SMRSU. Fluted points are rare. Middle-era complexes such as Agate Basin and Cody seem to be best represented (Table 5.2). Are there differences in the distribution of Paleo complexes from one side of the Missouri River to the other?

Settlement Behavior

At various times during the early Holocene subsequent to glacial recession, a number of landforms would have been open for settlement. These include remnant surfaces of old river terraces and the rim of the uplands overlooking the valley. This is where most Paleo sites should be found. Shoreline erosion along Lake Oahe in South Dakota has exposed Paleo artifacts in terrace settings at the Travis 2 site (39WW15) (Ahler et al. 1977) and at the Walth Bay site (39WW203) (Ahler et. al. 1974). What are the differences between Paleo settlements located on Missouri River terraces and those located along the rim of the uplands?

Native Subsistence Practices

Subsistence practices in other parts of the Northern Plains included hunting mastodons, mammoths, and giant bison. Later, following the early Holocene biotic transition, the focus narrowed to bison. There is an information deficiency regarding the plant foods available for gathering as well as those that were actually gathered or collected for consumption or other purposes. Any excavations at Paleo sites should involve efforts to recover and identify floral remains in the form of pollen, phytolyths, and carbonized macrofossils.

Technologies

Knowledge concerning the array of technologies implemented by Paleo hunter-gatherers in the SMRSU is largely restricted to observations based on the sample of chipped stone tools and debris which have been found and reported, such as 32ML914 in this SU (Hiemstra et al. 2006). An exception is the bone beads and bone tools recovered

from the Agate Basin component at the Beacon Island site (32MN234) in the Garrison SU (Mitchell 2012:201-202). Tool aggregates from residential bases have not yet been sampled and described to provide clues to the broad range of everyday domestic activities which typified the early lifeways. This data gap limits the ability to consider bone and antler technologies such as those reported from investigated sites elsewhere in the Northern Plains (cf. Frison and Stanford 1982; Frison and Zeimens 1980). Surely other raw materials such as wood and shell served as stock material for the fabrication of a variety of tools (cf. Frison 1989). What is the nature of the technologies which were employed to produce Paleo ceremonial artifacts and other stylized decorative items?

Artifact Styles

Paleo knappers produced some of the most distinctive styles of points. Specimens present in the Ralph S. Thompson collection from Emmons and Morton counties include examples of Scottsbluff, Eden, Meserve(?), Agate Basin, and other untyped lanceolate points (Figure 5.2). The Scottsbluff points seem to display greater affinities with eastern stylistic variants than western and southern variants. They are more similar, for example, to specimens from Wisconsin (e.g., Buckmaster and Raquette 1988:111-112) than those from the Horner and Carter/Kerr-McGee sites in Wyoming (cf. Frison 1983:Figure 8.6). Regional developments have been the basis for defining the contemporary Firstview and Kersey complexes in the Southern and Central Plains (ibid.:117,120). Are the Scottsbluff materials in eastern North Dakota (or all of North Dakota) affiliated with an eastern Cody complex rather than a Northwestern Plains or Central Plains complex?

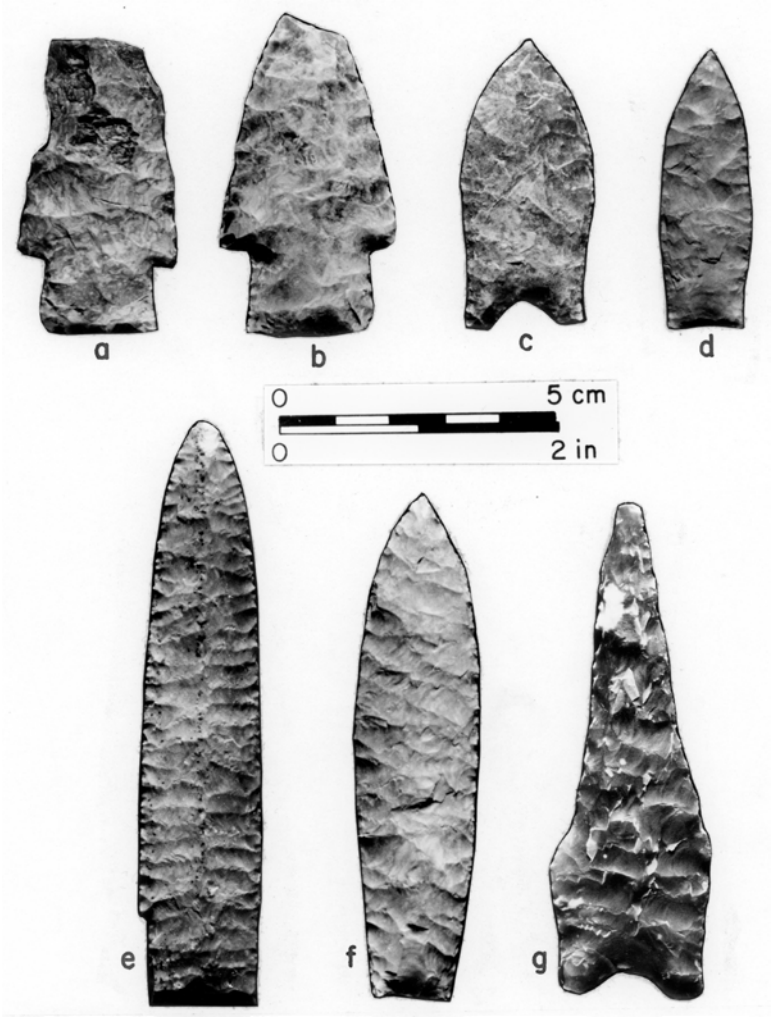
Regional Interaction

The occurrence of artifacts made from nonlocal (“exotic”) stones is evidence for regional interaction during the Paleo period. Frison (1982b:173-178) outlines source areas for a number of lithic raw materials which could possibly occur as artifacts in the SMRSU. What is the range of lithic raw material types likely to occur here in Paleo components?

Historic Preservation Goals, Priorities, and Strategies

The principal data gap is the paucity of recorded sites. A priority should be the identification and recordation of Paleo sites in the SMRSU with attention to the landforms on which they occur. Correlations of sites and landforms will provide useful information for future management of these important and poorly known cultural resources.

Figure 5.2: Paleo Points from the Southern Missouri River Study Unit found by Ralph S. Thompson: (a-b) Scottsbluff; (c-d) untyped lanceolate forms; (e) Eden; (f) Agate Basin; (g) possibly Meserve or reworked Goshen. Specimens (a)-(f) are from Emmons County. Specimen (g) is from Morton County.



Plains Archaic Periods

The Plains Archaic tradition witnessed a variety of hunting and gathering lifeways, but unlike Paleo, adaptations were geared to essentially modern flora and fauna. Archaic subsistence strategies dominated the Northern Plains between 5500 BC and sometime during the first millennium AD. The Plains Archaic is subdivided into Early, Middle, and Late periods based on associated cultural complexes which are represented in the SMRSU. Distinctive styles of projectile points serve as cultural markers for these complexes.

Paleo-Environmental Modeling

Three climatic episodes have been defined during the nearly 4,000 -year span of the Archaic periods: Atlantic, Sub-Boreal, and Sub-Atlantic. Climatic conditions during much of this time are posited to have been arid and droughty with brief periods of more mesic conditions. The biotically favorable mesic interludes are thought to have been more common during the latter Sub-Boreal and Sub-Atlantic than the earlier Atlantic. Clayton et al. (1976) suggest that much of the fine-grained aeolian fill on the Missouri River terraces was deposited under arid conditions.

The rate of valley infilling in the Trench is thought to have diminished during the latter part of the Sub-Boreal. Mid-Holocene geomorphology is poorly known for the Trench and tributary valleys where innumerable Archaic sites surely lie buried in alluvial, aeolian, and colluvial fill. How deep is the Mid-Holocene alluvial fill in the Missouri River valley? What was the nature of Missouri River bottomland habitats throughout the Archaic periods?

Cultural Chronology

There is a scarcity of chronometrically dated site deposits from all three Plains Archaic time periods in the SMRSU. Early Archaic deposits were present at 32ML903/914 and 76 features (hearths, bone concentrations, flake concentrations, and caches) were excavated (Hiemstra et al. 2006). Isolated finds of large side-notched (Simonsen) projectiles are reported by Larson et al. (1986:Figure 6.5c). A possible large form of Oxbow projectile point/cutting tool was recovered from the Beaver Creek site (32EM49) (Billeck 1983q:Figure 68.8b). But follow-up excavations encountered only a deposit dating to the initial Late Archaic (Hudak 1983). Private collectors purportedly have found points exhibiting nonlocal styles at sites south of the state line along the Missouri River (Marion Travis personal communication to P. Picha, 1989). These include Dovetail forms (cf. Stoltman 1986:Figure 4-3).

Middle Archaic remains are better represented. They can be found in the uplands as well as within the Trench at sites such as 32EM30 (Larson et al. 1986:6.8a, b). West of the Missouri River between the Cannonball and Little Heart rivers McKean (32MO100) and Hanna (32MO98) components have been recorded (Christensen 1990:Table 1). A Middle Archaic component was present at 32ML903/914 (Hiemstra 2006). Several stone

circle sites in Mclean and Oliver counties (Deaver 1985; Deaver and Deaver 1987; Hope and Peterson 2006; Späth 1992; Peterson and Broedel 2010; Thomas and Peterson 2010) have Middle Archaic components.

Late Plains Archaic Pelican Lake components are better represented. Various forms of small corner-notched dart points have been found. Two dated Late Plains Archaic components appear in the literature. Hudak (1983:2.15) reported a suite of four dates with a mean of 3142 RCYBP at 32EM49. A buried cultural horizon at 32EM72 was dated to 3000±120 RCYBP (Larson et al. 1983:115). Survey work along the Missouri River in Emmons and Sioux counties has resulted in increased numbers of recorded sites (Larson et al. 1983, 1986; Penny et al. 1987). Pelican Lake points have also been found in the Cross Ranch locality in the northern reaches of the SMRSU (Ahler et al. 1981; Ahler et al. 1982; Weston et al. 1980). In Morton County, archeologists recorded Pelican Lake points at 32MO98 (Christensen 1990). Late Archaic deposits were present at site 32ML902 (Hiemstra et al. 2006). In addition, Late Archaic deposits have been recorded at several stone circle sites (Hope and Peterson 2006; Peterson and Hope 2006; Peterson and Thomas 2011; and Strait and Peterson 2007).

During periods when xeric climatic conditions prevailed, the Missouri Trench may have offered the only game in the area. At times, it may have provided the only habitats in the state that could support permanent occupation. If this was the case, we should expect a more variation in artifact styles at some Archaic sites in and near the Trench. When the archeological record is more complete, we might anticipate more complex cultural chronologies will be developed for the Plains Archaic periods within the SMRSU and the Garrison SU than for elsewhere in the state.

Settlement Behavior

The settlement practices of Plains Archaic peoples are not well known due to the small number of investigated sites compared with the following Plains Woodland and Plains Village periods. This lack of known sites is likely a function of their relatively deep burial in alluvial bottomland settings along the Missouri River and lower order tributary streams draining to the Missouri River. During the Northern Border Pipeline survey, artifacts attributable to the Plains Archaic often occurred in upland settings where there has been minimal soil deposition since the Early Holocene (cf. Root et al. 1983). This is also the case as seen from multiple sites in McLean and Oliver counties tested and/or mitigated in several mine areas.

Limited test excavations conducted on the Cross Ranch in the northern portion of the SMRSU documented Late Plains Archaic deposits at several sites. An upland temporary camp or game processing locus is represented at the Rivera site (32OL170) which is associated with the nearby Bundlemaker bison kill site (32OL159) (Ahler et al. 1981; Ahler et al. 1982). Plains Archaic groups were exploiting resources in the Uplands and Breaks physiographic zones.

Toom (1988) reported probable Archaic age artifacts in deep tests conducted in a Missouri River terrace setting at the Flaming Arrow site (32ML4). Larger-scale excavations sounded the early Late Archaic deposits at 32EM49 along Beaver Creek in a stream terrace context (Hudak 1983). Attempts need to be made in correlating Archaic functional site types with landforms in order to model settlement behavior. Terrace settings were probably characteristically open prairie, unsheltered locations once boreal forest conditions withdrew in the early Holocene. Warm season residential bases should be anticipated in terrace settings with winter residential bases in more sheltered floodplain settings. What forms of archeologically recoverable evidence for seasonality can be expected in Plains Archaic deposits in this part of North Dakota?

Native Subsistence Practices

What is known concerning Plains Archaic subsistence is largely derived from test excavations at a few sites. The Late Plains Archaic component at Beaver Creek produced small quantities of bison and fish scales (Schaaf 1983). This cultural deposit also produced *Chenopodium* sp. remains which were interpreted to be of cultural origin (ibid.). Chenopods commonly were utilized for food in the Midwest during Late Archaic times (cf. Asch and Asch 1978; Seeman and Wilson 1984). Bison bone also is reported from 32EM72 (Larson et al. 1983).

The importance of hunting to the Plains Archaic lifeway can be deduced by the frequent occurrence of dart point tips of many different styles. The role of plant foods is not assessed as easily given the low numbers of identified ground stone plant processing tools reported in the literature. Standard flotation sampling of feature and non-feature matrices during excavation could recover remains which would add information concerning Plains Archaic subsistence strategies. Given the environmental conditions of this part of North Dakota, what quantity of chenopod plant growth should be expected to have occurred naturally in the disturbed habitats of abandoned hunter-gatherer settlements? What quantity of charred chenopod seeds could be expected to occur as part of the non-artifactual content of Archaic cultural deposits in this area?

Technologies

Plains Archaic complexes in the SMRSU are known best for their chipped stone technologies, although bone and ground stone technologies have been considered upriver in the Garrison SU on the basis of small Middle and Late Archaic samples excavated from the Mondrian Tree site (32MZ58) (cf. Gregg 1983d:Table 23.2). At Oxbow sites in the Canadian Plains, copperworking technologies are indicated (cf. Millar 1978:335-338; Wormington and Forbis 1965:Figure 45), but these artifacts may have been brought in through exchange mechanisms. Again, outside of the SMRSU, shellworking technologies are represented by beads and disks in Middle Archaic deposits at Mummy Cave in Wyoming and Cactus Flower in Alberta (Brumley 1975, 1978; McCracken et al. 1978; Wedel et al. 1968). Future investigations in the SMRSU surely will result in new information concerning applications of varied technologies during the Archaic. What is

the evidence for ground stone woodworking tools dating to the Plains Archaic periods in this SU?

Technologies were also applied to build structures for residential settlements and other purposes. What technologies were applied to build structures through the different Archaic periods and complexes? Structural remains are mostly likely to be best preserved in deeply buried alluvial and colluvial depositional contexts.

Artifact Styles

The formal dimensions of Early Plains Archaic artifact style are poorly known in the SMRSU. Only a few specimens have been reported from surveys (cf. Larson et al. 1983, 1986; Penny et al. 1987; Root et al. 1983). These include large side-notched and corner-notched specimens, but they are all from undated contexts. The Simonsen dart point form, along with a possible variety of other closely related, well made large side-notched forms with ground incurvate base haft elements, are distributed from Nebraska northward throughout the Northern Plains in Early Archaic components (e.g., Agogino and Frankforter 1960b; Ahler 1989:116; Ahler et al. 1977; Frison et al. 1976; Gryba 1976; Kivett 1962; Kuehn 1982c, 1984; Shay 1971, 1978; Shutler et al. 1974). Components with these forms can be expected to date within the approximate 2,000-year long temporal range of 5500-3200 BC. The best chance to identify intact cultural deposits of this antiquity is in cutbank exposures of Missouri River terraces.

Middle Plains Archaic point styles representative of the McKean Lanceolate, Duncan, and Hanna complexes are present in surface collections from sites in the central and southern portions of the SMRSU along the Missouri River (Christensen 1990). One unusually large Oxbow style basal fragment was recovered from 32EM49 (Billeck 1983q:Figure 68.8b).

Small, medium, and large corner-notched forms occur with greater frequency. These are often termed “Late Archaic/Middle Woodland.” Small Pelican Lake forms are associated with both Late Plains Archaic and Early Plains Woodland components in the eastern river valleys of North Dakota, while the Besant and Samantha side-notched types in conjunction with a minor frequency of large corner-notched forms characterize Middle Plains Woodland deposits (cf. Gregg and Picha 1989b). As suggested for southwestern Manitoba, do the large “Archaic Barbed” corner-notched forms date to the earlier part of the Late Archaic period while the smaller “Plains Middle Woodland Pelican Lake points” date to the later part of the period? (cf. Syms 1980:364-365, 370).

Regional Interaction

Stone tool stylistic attributes and the infrequent occurrence of nonlocal materials in Early and Middle Plains Archaic assemblages suggest that interaction networks generally were limited to the Northern Plains. The possibility of renewed long-term contacts with the Eastern Woodlands groups, a phenomenon characteristic of Paleo times, cannot be confirmed given existing data (cf. Brose 1979). However, the notion that the

Late Plains Archaic sphere of interaction and exchange may have broadened is suggested by the occurrence of corner-notched specimens usually termed Pelican Lake at locations further to the east (cf. Tiffany 1986:166-167). Also, copper beads attributed to the Pelican Lake component in Cultural Zone 2 at the Mondrian Tree site (32MZ58) at the upper end of the adjacent Garrison SU indicate exchange with groups in the upper Midwest on a Late Archaic time level (Toom 1983f). Information concerning regional interaction most readily is garnered from data regarding nonlocal lithic raw materials. But artifact samples must be collected from single component artifact levels or features which can be soundly dated to one of the Archaic periods. If nonlocal material source areas are classified by direction (e.g., north, east, south, west), what is the evidence for changes in directionality of interaction through the three Archaic periods? (cf. Ahler 1988c:162; Reher and Frison 1980:127-130).

Historic Preservation Goals, Priorities, and Strategies

When the pool level of Lake Oahe is elevated, Plains Archaic archeological deposits are destroyed by wave action and shoreline erosion (cf. Larson et al. 1983:149). With decreases in pool elevation in the late 1980s and again in l998, this sort of destruction was alleviated. Low pool levels present the opportunity to conduct test excavations at known Archaic deposits which will undergo renewed erosion when pool levels rise. North Dakota archeologists should work with Omaha District Corps of Engineers cultural resource specialists to develop test excavation programs at shoreline sites in the "take area" along Lake Oahe.

Plains Woodland Periods

Plains Woodland lifeways likely were similar in many respects to those of the preceding Plains Archaic. However, the Early and Middle Woodland periods provide the first evidence for (1) routine production of ceramic vessels for cooking, (2) burial mound mortuary practices and ceremonialism, and possibly (3) some gardening. The Plains Woodland era, like the Plains Archaic, is subdivided into Early, Middle, and Late periods.

Paleo-Environmental Modeling

Within the SMRSU, research needs to be devoted to environmental reconstruction. During the Early and Middle Plains Woodland periods, coinciding with the latter half of the Sub-Atlantic climatic episode, conditions are thought to have been more mesic than today. This situation would have fostered an increase in the regional biomass and hence increased human carrying capacity. Population increases and cultural florescence are suspected to have accompanied this climatic amelioration. Cultural deposits associated with well-developed paleosols in alluvial and colluvial settings along the Missouri River and its tributaries need to be documented and investigated to further test this proposition.

During the Scandic climatic episode (AD 400-750) intervening between Middle Woodland and Late Woodland/incipient Plains Village climaxes, climatic conditions are hypothesized to have deteriorated for a time with warm and dry weather prevailing during the Middle to Late Woodland transition. Following this downswing, precipitation is hypothesized to have increased to another peak during the Neo-Atlantic (ca. AD 850-1250). The return of mesic conditions is posited to have once again coincided with cultural florescence in the region marked by the Late Plains Woodland-Formative Village transition.

Larger samples of paleo-environmental information need to be generated from Early, Middle, and Late Plains Woodland sites in the SMRSU. Surface and shallowly-buried tipi ring sites in the uplands often lack contexts favorable to the preservation of delicate floral and faunal remains which yield data most useful for reconstructing climatic conditions and seasonality at the time of occupation. What sorts of site depositional contexts are most likely to hold artifacts and ecofacts with highest potentials to yield important information concerning Woodland environmental conditions?

Cultural Chronology

Five Early Plains Woodland components have been recorded thus far in the SMRSU, but more should be expected to occur in buried alluvial settings stratigraphically underlying Middle Woodland deposits. They should contain small corner-notched dart points and may be initially mistaken for Late Archaic deposits until the distinctive coarse-tempered ceramic potsherds are recovered. Are Early Plains Woodland components in the SMRSU sufficiently similar to those from the James River SU to indicate a cross-subareal development of an Early Woodland culture from a single, Pelican Lake complex which was distributed across portions of the Northeastern Plains and Middle Missouri subareas?

Besant/Sonota components are well represented here (Neuman 1975). Included are mound sites such as Boundary Mounds (32SI1), Schmidt (32MO20), and Alkire Mounds (32SI200) (Henning 1965). There are habitation sites such as High Butte (32ME13) (Wood and Johnson 1973), Wounded Knee (32EM21) (Root 1983v), Anderson Tipi Ring (32ML111) (Deaver 1985), Dancing Grouse (32ML107) (Deaver and Deaver 1987), 32BL823 (Kuntz et al. 2013), and 32MO98, 32MO100, 32MO163 (Christensen 1990). Additionally, there are bison kill locations such as Bundlemaker (32OL161) (Ahler et al. 1981:57). Radiocarbon assays obtained from Wounded Knee (1930±100 RCYBP) (Root 1983v:965), High Butte (AD 350±140) (Wood and Johnson 1973:35), and Alkire Mound (AD 300±200) (Wood and Johnson ibid.:Table 4) firmly establish the Besant/Sonota components at these sites within the Middle Plains Woodland period. Other conical and linear mound groups of presumed Woodland age occur in the SMRSU as well (cf. Chomko and Wood 1973; Weston et al. 1980). Additional Middle Plains Woodland site types surely will be identified as work progresses in the region. A useful resource is Deaver and Deaver (1987) in providing a list of sites with Besant/Sonota components with the radiocarbon dates.

Sites attributed to the Late Plains Woodland period in the SMRSU generally contain cord roughened ceramics and small, side-notched arrowpoints. A number of these have been investigated in the "breaks" physiographic zone on the Cross Ranch in Oliver County (Ahler et al. 1981; Ahler et al. 1982). Ahler (1993:65) proposed the Charred Body complex in the Knife and Heart regions based on settlement plan, house form, Late Woodland-like pottery, and lack of evidence for corn horticulture at Menoken and Flaming Arrow. Radiocarbon dates from three posts from an oval, semisubterranean structure (Toom 1988) at Flaming Arrow average 935±36 BP (cal. AD 1035-1158). Four samples of charred botanical remains from two houses at Menoken produced internally consistent dates with a mean of 861±28 BP (cal. AD 1159-1221) (Ahler 2003:224; 2007:18). The 1998, 1999, and 2006 excavations at Menoken have provided significant new information regarding the transition from a village-based Terminal Late Woodland hunter-gatherer lifeway to the earliest Plains Village hunter-farmer lifeway (Ahler 2007:15-31).

Settlement Behavior

Plains Woodland peoples appear to have used the Trench as a focus of residential settlement. Sonota occupation sites such as High Butte are found in valley rim settings overlooking the floodplain. Solitary mounds and mound complexes are situated near the valley rim in the uplands (cf. Weston et al. 1980). Natural entrapments along game trails leading through the breaks to the uplands were spots where bison were hunted. The breaks zone was also heavily utilized by Late Plains Woodland groups on the Cross Ranch for habitation. Campsites were situated in proximity to bison kill and butchering locations as well as mortuary mound complexes. An assessment of nomadic settlement-subsistence structure and bison ecology is discussed by Hanson (1983:1342-1417).

Early or Middle Woodland settlement is also indicated in tributary stream valleys such as along Horsehead Creek. The Serr site (32EM58) on a low stream terrace along Horsehead Creek yielded a small Besant side-notched point (Gregg et al. 1983a:Figure 58.3b) and three radiocarbon dates from a hearth feature indicating Early or Middle Woodland occupation represented in the lower cultural zone. Excavated materials from the lower cultural zone provide evidence for TRSS workshop activities and bison processing. Tongue River silicified sediment is present in sufficient quantities in various parts of the SMRSU to have attracted special-purpose procurement-workshop task groups. The total uncorrected one sigma date range for the three radiocarbon dates from the Serr site is 2740-2110 BP (790-160 BC) (ibid.:1024).

At present there is a paucity of information regarding Late Woodland settlement patterns in this SU due to limited number of sites identified. Known sites include those on the Cross Ranch (Ahler et al. 1981; Ahler et al. 1982), Menoken, Flaming Arrow, and 32MO98 (Ahler 2007:15-31) and a few others. Linear mounds in uplands, encampments in break zones, and fortified settlements along the Missouri River and at least one tributary (Apple Creek) are known.

The geophysical survey at Menoken provided a site-wide settlement layout (Kvamme 2003:557-563, 2007:215). Two oval houses were subsequently excavated at Menoken revealing two distinct architectural styles (pithouses and surface houses) (Ahler 2007:15-31). Both houses are firmly dated to ca. AD 1200, as are the two pit houses located outside the fortification ditch.

As Ahler (2003:576) states there needs to be a "continuing study of the timing and process of transition from a village-based terminal Late Woodland hunter-gatherer lifeway to the earliest Plains Village, hunter-farmer lifeway." Similar studies to those at Menoken and use of geophysical techniques site-wide need to continue.

Even though the Late Woodland period (AD 600-1200) is shorter than the Middle Woodland period (100 BC-AD 600), the sample of Late Woodland sites should be much larger than it is. Why are Late Woodland components so poorly represented?

Native Subsistence Practices

Menoken provides significant information regarding the presence of botanical remains at a Terminal Late Woodland site (Nickel 2003: 255-276; Nickel 2007:134). The botanical remains at Menoken include small amounts of corn and a squash seed. The only tool providing evidence of gardening was a possible working edge of a scapula digging tool (Ahler 2007:21). There is evidence of harvesting of goosefoot and collection an array of wild plants (rose, plum, buffaloberry, dogwood, snowberry, grape, chokecherry pits) (Nickel 2007:134). Ahler (2003:576) suggests future subsistence research should focus on the following topic:

> A more definitive understanding of the subsistence base for the settlement, resolving the enigma of an apparent semipermanent community with a sizeable population, but lacking a horticultural resource base. Such work could begin with more intensive study of charred parenchyma and phytoliths, near-site botanical surveys, and systematic search for plant food resources that are less conspicuous in the archeological record.

Fine-screen recovery of large volumes of soil will provide a more complete collection of evidence for use of wild fruits and cultigens. What similarities and differences are there in plant use between Late Woodland versus Plains Village sites? While it is certain that wild plant foods were an essential part of the diet, were any of these wild species tended or encouraged to an extent indicative of at least incipient gardening early in the Woodland timeframe? What should be expected in North Dakota sites as archeological evidence for incipient gardening?

Technologies

The Besant/Sonota ceramic vessels represented in excavated samples from the Wounded Knee site (32EM21) (Root 1983v) share similarities in form, surface treatment, and temper with pottery produced at contemporary sites in the James River SU (cf. Gregg

and Picha 1989b). Carbonized residues on vessel interiors from both areas indicate they were used for cooking. Middle Woodland ceramics are better represented in this SU than either Early or Late Plains Woodland ceramics. What are the technological attributes of transitional Early-to-Middle Woodland and Middle-to-Late Woodland ceramics in this area? In answering these questions it is clear that in addition to traditional ceramic analysis there needs to be an analytical component specific to manufacturing practices as was undertaken for the terminal Late Woodland Menoken Village (e.g., Krause 2007:32-40).

Sonota/Besant chipped stone assemblages from Wounded Knee and High Butte (32ME13) evince heavy reliance on KRF supplemented by regular use of locally available materials. In an excavated sample from Wounded Knee, KRF accounts for 32% of the chipped stone tools and 53% of the flaking debris, and locally available TRSS accounts for most of the remainder. At High Butte further north and closer to the KRF source area, KRF accounts for 90% of the recovered chipped stone tools and flaking debris reported by Wood and Johnson (1973:Table 3). At the terminal Late Woodland Menoken site, KRF occurs in about 95% of the flaking debris and ca. 93% of chipped stone tools (Ahler 2003a:442-443). Closer available lithic materials comprise only about 3% of the flake and tool collections and truly distant sources represent less than 1% of the chipped stone tools and flakes (ibid.: 443). What sort of stone raw material selection pattern are represented at other Woodland sites?

Boneworking debris was also recovered from the Besant/Sonota components at Wounded Knee and High Butte. A bone cutting tool and a bone tube fragment were recovered from Wounded Knee. A pendant made from a canid incisor, scrap from making bone beads, and expediently fashioned rib tools were found at High Butte. Can any aspects of Besant/Sonota boneworking technology be identified as diagnostic of Middle Plains Woodland technologies?

Artifact Styles

Besant and Samantha side-notched dart point/cutting tools are diagnostic of Besant/Sonota complexes of the Middle Plains Woodland period and occur in most collections dating to this era (Neuman 1975; Root 1983v). Some large corner-notched forms also usually are present in low frequencies. Sonota ceramic vessels are conoidal to subconoidal in form and most have cord roughened exteriors. Decoration is usually limited to the lip and exterior rim areas; bosses and punctations are characteristic. What artifact styles are diagnostic of Early and Late Woodland components in the SMRSU?

Late Woodland arrowpoints are typically small side-notched forms falling into both of the gross classes termed Prairie side-notched and Plains side-notched (Ahler et al. 1982; Kehoe 1973). The Prairie side-notched class is construed so broadly as to have little utility for specifying anything other than very general temporal affiliation. Can specific types be identified within the Prairie side-notched class for which more meaningful cultural affiliations are specifiable?

Late Woodland ceramic vessel samples also exhibit considerable stylistic variability. At present, the excavations at Menoken have provided the largest pottery sample from a Late Woodland context for the study area. The sample from Menoken was heterogeneous displaying predominately Late Woodland characteristics with a blending of Plains Village traits such as the S-rim vessels and trailing on the shoulder/body (Swenson 2003:327-355) and manufacturing techniques (Krause 2007:32-40). Other Late Woodland sites with similar collections include Cross Ranch, Flaming Arrow, and other sites in Morton and Emmons counties.

Regional Interaction

The occurrence of artifacts made from nonlocal and exotic raw materials in Middle Plains Woodland assemblages is one indication of increased regional interaction over that of preceding Archaic times. Sonota components in the SMRSU hold artifacts fashioned from nonlocal stones, freshwater and marine shells, and metallic ores such as copper (Neuman 1975). The trade routes and the particular cultural mechanisms guiding these exchange relations need to become better understood.

Trade materials represented at the terminal Late Woodland Menoken site include native copper and marine shell. The native copper would not have been archeologically recovered without fine-screened recovery. Marine shell artifacts include beads, tubes, and a pendant (Ahler 2003:573). Fine screen recovery is vital in identifying trade material as well as several other artifact classes.

Historic Preservation Goals, Priorities, and Strategies

The few remaining earthen mounds and mound complexes along the Trench should be recorded and preserved from further destruction. These mounds are often smaller than in the James River and Sheyenne River SU to the east. Residential bases and other site types located near these mounds should be inventoried as well. A top priority should be to establish a unified approach amenable to all concerned for the preservation and study of prehistoric mortuary sites.

Research into Late Plains Woodland adaptations should continue such as that of Menoken State Historic site. The continued study of the timing and process of transition from a village-based terminal Late Woodland hunter-gatherer lifeway to the earliest Plains Village, hunter-farmer lifeway is recommended by Ahler (2003:576). Transitional sites should be identified and studied.

As with Archaic sites, there are significant intact Woodland-age deposits eroding from the Oahe shoreline. Archeologists working in North Dakota should confer with Omaha USACE cultural resource specialists and request federal aid in conducting salvage work at places such as Wounded Knee (32EM21) where a Besant/Sonota deposit is eroding (cf. Root 1983v:998).

Plains Village Period

Menoken State Historic Site (Ahler 2007:15-31) provided solid evidence for origins of the Plains Village lifeway in the SMRSU. The Plains Village lifeway developed to its fullest expression in late prehistoric and protohistoric times in this SU.

Paleo-Environmental Modeling

Tree ring studies from oak trees near Bismarck (Will 1946) indicate dozens of alternating droughty and mesic periods over the past 500 years. While the specific responses of particular cultural groups to such environmental change may seldom if ever be identified, it ought to be possible to explicate ranges of general cultural responses or adaptations. Tree ring studies should continue with wood samples from a variety of ecological contexts in an attempt to model effective soil moisture for the SMRSU as a whole over the past 500 years.

Cultural Chronology

Within North Dakota lie portions or all of the Cannonball, Knife-Heart, and Garrison archeological regions of the Middle Missouri subarea. The most refined archeological chronology for any part of North Dakota is the one devised for the Plains Village period in the upper (northern) portion of the Knife-Heart region. This chronology has been derived from data amassed from excavations at many village sites situated between the mouth of the Heart River and the KNRI. The chronology comprises phases which are defined based on material cultural traits and settlement characteristics. The chronologically most significant material cultural traits are some rather precise ceramic vessel stylistic and technological attributes. In the initial formulation of this chronology, most of the phases were sequential while one ran parallel to the basic sequence (cf. Picha et al. 1989:8). The Clark's Creek phase was dated AD 1000-1200, Nailati phase 1200-1400, Heart River phase (1400-1710), Scattered Village complex 1400-1700, an unnamed protohistoric phase 1710-1750, and Knife River phase 1750-1861 when the Villagers abandoned their upper Knife-Heart homeland and moved northwestward into the Garrison Region to establish Like-a-Fishhook village. The Heart River phase was defined as precontact in age, but excavations at the Big Hidatsa village site (cf. Ahler and Swenson 1985b) indicate that European trade goods may have begun reaching the villages by as early as AD 1600 rather than 1710 (ibid.:108).

Ahler (1993:57-108) extensively revised the working culture-historic framework for the Plains Village tradition in the Upper Knife-Heart region of the Middle Missouri subarea. Below is a list of phase assignments and reassignments for archeological components (ibid.:Figure 25.2 and Table 25.1).

1830-1886:	Four Bears phase
1785-1830:	Roadmaker phase
1700-1785:	Minnataree phase
1600-1700:	Willows phase

1525-1600:	Hensler phase
1450-1525:	Mandan Lake phase
1400-1450:	Scattered Village phase
1300-1400:	Nailati phase
1200-1300:	Clark's Creek phase
pre-1200:	Formative Village

Craig Johnson's 2007 publication *A Chronology of Middle Missouri Plains Village Sites* is another important reference in Plains Village studies.

Settlement Behavior

The vast majority of North Dakota's earthlodge villages and other sorts of Plains Village settlements are in the SMRSU. Plains Village people lived in other parts of the state, but village settlements were more intensively and continuously occupied in the SMRSU than in any other. This is probably related to the reliability of the Missouri River as a water source as well as the quantity of diverse subsistence and technological resources available in and along the Missouri River valley. Climatic conditions may also have been factors.

Site-wide use of geophysical techniques in combination with traditional excavation in the Heart River region at traditional Mandan sites have revealed these settlements were much larger and occupied longer than previously recognized (Ahler 2004, 2005, 2006; Ahler and Geib 2007:442-451; Kvamme 2007:210-221; Kvamme and Ahler 2007:539-561; and Mitchell 2007). The use of combined site-wide remote sensing and excavation at village sites should continue in order to maximize understanding of these complex sites.

Relatively little is known of activities outside the villages and the archeological remains generated by such activities compared to what is known of life within the villages from archeological studies, ethnohistoric accounts, and ethnography (Picha et al. 1989:108). More ought to be understood regarding outside-village activities. One of the findings which prompted the explication of this research goal was FCR concentrations associated with Knife River Fine ware ceramics at the Hotrock site peripheral to Lower Hidatsa village at KNRI (Ahler and Mehrer 1984:71). These particular artifact concentrations may mark the locations of special-purpose sweatbathing in areas removed from the main villages (cf. Picha et al. 1989:87).

Other site types such as camp sites used as hunting camps, kill and processing localities, and procurement areas will provide information regarding the full range of settlement and subsistence patterns of the Mandan, Hidatsa, and Arikara. Stone ring sites and cairns in this SU have been identified as having Plains Village components (Good 1983; Peterson and Peterson 1996; Peterson and Thomas 2011; Root and Gregg 1983; Späth 1992; Thomas and Peterson 2010).

Since the SMRSU has most of the Plains Village sites, it seems reasonable to expect that most of the state's Plains Village mortuary sites and cemetery areas also are here. Modes of interment were varied. Some remains were buried in the ground within the bounds of the villages, some may have been placed in earthen mounds on the valley rims overlooking the valley, some were interred in solitary graves around the village peripheries such as those around Double Ditch, Motsiff, Fort Clark, and KNRI. Other human remains appear to have been buried in pits on hilltops and ridgetops, then capped with stacked rock monuments. There are a series of such sites on the hilltops east of the Badger Ferry village site (32EM7). A large cairn at one such site (32EM61) was fully excavated and attributed to the Plains Village tradition on the basis of the styles of arrow points found with the burials (Gregg et al. 1983b). Bowers (1950:99) recorded that some Mandans preferred this sort of burial under stone cairns on hilltops.

Deceased Arikaras were interred in a cemetery area around the Fort Clark site (32ME2). This cemetery area, which was recorded by Lewis Henry Morgan, shows clearly on a large-scale map of the entire site area which covers ca. 100 acres with more than 2,200 surface features including the Arikara graves (Wood and Billeck 1988). Did Plains Village mortuary practices vary between peoples with Extended and Terminal Middle Missouri material culture?

Rock art sites attributable to Villagers exist in the SMRSU. But they are uncommon because of the scarcity of exposed rock surface suitable for painting, incising, and pecking. Site 32ME348, the Indian Temple site, was recorded 100 m from the eastern edge of the Stanton Mound Group (32ME104). It consists of a human face glyph and linear glyphs executed on sandstone (AHP site files). John Taylor (ibid.) suggested this rock art site could be linked to the Hidatsas on the basis of ethnographic information. The Sacred Mountain site (32SI207), located two miles west of the town of Cannonball, south of the Cannonball-Missouri confluence, consists of four granite boulders on a hilltop with glyphs of buffalo tracks, bear paws, thunderbird tracks, serpents, and turtles. In *North Dakota: A Guide to the Northern Prairie State* prepared by the workers of the Federal Writers Project of the WPA in 1938 (printed by Knight Printing, Fargo, North Dakota), it is written that this site was revered by Mandans, Arikaras, and Sioux (1938:314). This work also states that after the "great flood," the First Man and First Woman of the Mandan first stepped here.

Native Subsistence Practices

The definition of the Plains Village lifeway typically involves horticulture which played the preeminent role in food production yielding a dependable, storable food surplus (e.g., Lovick and Ahler 1982). This sweeping generalization was questioned in the 1970s (cf. Nickel 1977) and was called into question anew in the late 1980s. Clearly, there were years when garden crops failed. But could the large village settlements have been supported principally by the products of hunting and gathering wild foods? Hunting and gathering have supported permanent settlement in rich habitats in other places in the world such as along the Pacific Coast in North and South America. It may also have been

possible with the rich biota which characterized the best of times during the Neo-Atlantic climatic episode in the Northern Plains.

Excavated samples from the White Buffalo Robe site (32ME7) indicate that corn, beans, squash, and sunflowers were cultivated, plus chokecherries, wild plums, buffaloberries, and goosefoot were used (Nickel and Jones 1980). There were remains of corn, beans, and squash from the Nailati, Heart River, and Knife River phase components (ibid.: Table 14.10). There were sunflowers in Nailati and Heart River samples. All three components yielded remains of wild plant foods in the form of the seeds of wild plum, chokecherry, wild grape. There were dogwood seeds in samples from all components (ibid.: Table 14.10). How did Plains Village gardening practices change through time? Did adoption of any new species during the Plains Village period result in great increases in storable food surpluses?

Nickel (2007:126-136) discusses samples from more recent botanical collections from village sites and suggests there may be a "long-standing Mandan tradition of combining cultivation of both exotic and indigenous cultivars with the collection and cultivation of weedy plant seeds." Nickel also points out the complications caused by sample size. Combinations of flotation for smaller samples and water-screening of large volumes of soil should be undertaken to more fully capture macrobotanical botanical specimens.

Technologies

Nowhere are Plains Village technologies, both prehistoric and protohistoric, better known than they are in this part of North Dakota from analyses of excavated sites along the Missouri River as well as ethnohistoric and ethnographic descriptions of the Hidatsa, Mandan, and Arikara. For example, chipped stone toolmaking technologies (e.g., Ahler 1975a, 1975b, 1977b, 1984b, 1988c; 1997, 2002, 2004, 2005, 2006; Ahler and Toom 1993) may be nearly as well-known now as they were when they were being practiced. As another example, details of the construction of circular earthlodges were recorded by Wilson (1934).

There is renewed interest in the study of ceramic manufacturing techniques, specialization, and clay sourcing (Hollenback 2012; Hollenback et al. 2014; Krause 2007:32-40; Mitchell 2013). Similar studies should continue to further our understanding regarding technologies, trade, interaction and movements of groups.

Despite the detail available for some categories of technological information, there is relatively little known about others. There has been very little exploration of seasonal differences in technologies. Historically, there were separate summer villages and winter villages. How did technological practices differ seasonally so that summer and winter settlements might be identified by their material remains?

Artifact Styles

Styles of designs and decorations on ceramic vessels have been fundamental for defining Plains Village cultural chronologies (e.g., Lehmer 1971). Ahler (2001) presents a source of pottery descriptions for Plains Village sites in the Heart, Knife, and Cannonball regions. Now there is a strong indication that decorative techniques and placements, lip forms, rim forms, thickness, and exterior surface treatment can be analyzed to identify remains deposited by Awatixa and/or Hidatsa-proper subgroups of Hidatsas (cf. Ahler 1988b, 1993). Were stylistic shifts essentially contemporary between Hidatsa people who lived along the Missouri River and their contemporaries who lived around Devils Lake or along the James River? Or did people of the same tribal affiliation distinguish their geographic separateness by executing different designs on some of their ceramics?

A unique decorative motif has been identified by Ralph S. Thompson on ceramic vessel fragments from four Extended Middle Missouri sites along the left bank of the Missouri River in Emmons County: the Havens site (32EM1), 32EM101 and 32EM102 about three miles north of Havens, and 32EM104 ca. 1.25 mi south-southwest of Little Beaver Creek Bay. The 32EM101, 32EM102, and 32EM104 village sites were not identified by Will and Hecker (1944) but have been revealed as the Lake Oahe shoreline has wasted landward (Ralph S. Thompson personal communication to M. Gregg, 1989). One partially restored vessel displaying this motif and a line drawing representation of the motif are illustrated below (Figure 5.3). The grit tempered vessel is classifiable as Riggs ware; it has lip tab handles and tool impressed lip decorations in addition to the exterior rim decoration. The exterior surface treatment ranges from smoothed to partly burnished, smoothed-over check stamped. Could the occurrence of this unique decorative motif in these four Extended Middle Missouri village sites be evidence that they were occupied contemporaneously?

Another diagnostic Plains Village artifact style is a thin, lightweight axe with a raised ridge on each side of the hafting groove. Axes such as this may have occurred first in late northern Extended Middle Missouri villages Lehmer 1971:124). An example made of slate and found by Ralph S. Thompson is illustrated below (Figure 5.4). It is from the Extended Middle Missouri village site 32EM102. This particular specimen is very unusual in that it has finely incised or scratched decorations on the poll and bit areas of both faces. How late did this style of axe persist in the Middle Missouri subarea? Is this style of axe diagnostic of the entire Terminal Middle Missouri time period (ca. 1100-1550) or just a portion of it? The style extends eastward to the James River SU where an example was found on the surface of the Larson site (32SN106) (cf. Gregg et al. 1987:150).

Figure 5.3: Partially restored vessel from 32EM104 with bear paw-chevron-scroll motif executed on the upper rim. A representation of the motif is drawn below the photo. The vessel decoration was done by trailing with tool impressing in the scrolled, dashed portion of the motif. Discovered by Ralph S. Thompson.

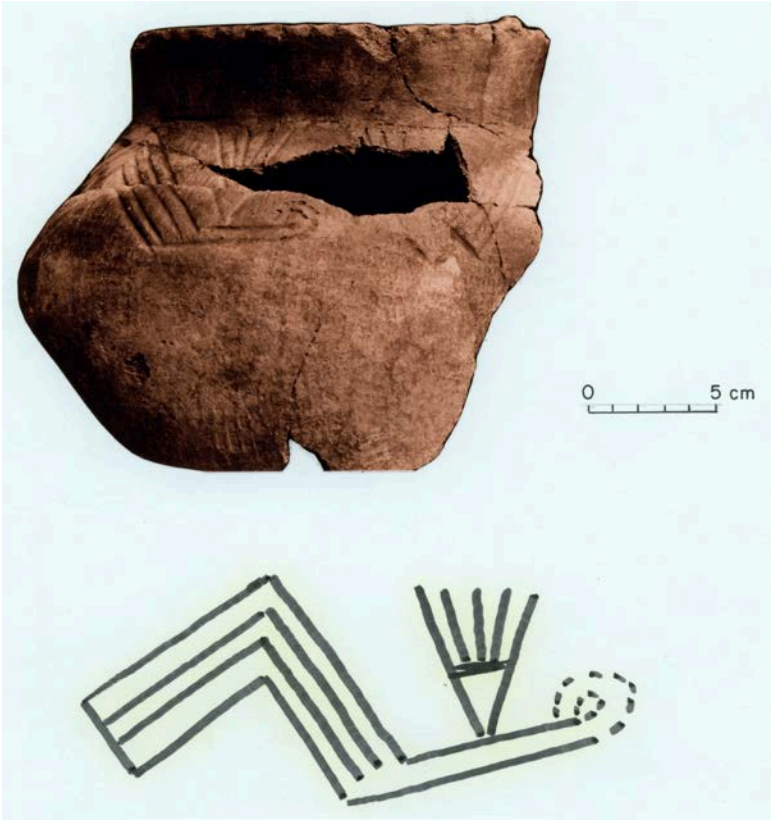


Figure 5.4: On the left, an Extended Middle Missouri style flat axe from 32EM102. On the right, a whelk shell gorget with “weeping eye” Southern Cult motif said to have been found near the Scattered Village site (32MO31). Information furnished by Ralph S. Thompson.

Regional Interaction

Antalis sp. shells from prehistoric Plains Village sites, and ethnohistoric references to Mandan and Hidatsa people dealing with other groups in the Rockies, are clear indications of long-range interactions to the West. The long-distance exchange of native materials continued into protohistoric times even after European goods became attractive commodities. An example of the protohistoric exchange of native materials is indicated by the recovery of Flattop chalcedony and exotic jasper/chert lithic materials from Lower Hidatsa West in the KNRI (cf. Picha et al. 1989:91).

The whelk shell gorget with “weeping eye” Southern Cult motif illustrated in Figure 5.4 is said to have been found near Scattered Village (32MO31), the village site where the Crow-Hidatsa schism of oral tradition may have taken place (Will and Hecker 1944:101) (Ralph S. Thompson personal communication to M. Gregg, 1989). This artifact is similar to two others from the “Emmons Mound” in the “vicinity of the Sheyenne Grasslands” (cf. Beckes and Keyser 1983:137-138) and a site near Melita in Southwestern Manitoba (Syms 1988). These artifacts are evidence not only for

interaction networks extending from the Middle Missouri subarea to the Gulf Coast (cf. Howard 1953), but from the Middle Missouri subarea throughout the Northeastern Plains.

The topic of Village interaction has been researched to a considerable extent (Ahler and Kay 2007; Mitchell 2013; Wood 1972, 1974, 1980, 1985). External relations involved not only exchanges of material goods, but also exposure to new and different religious practices (including mortuary behavior) as well as techno-economic innovations in the realm of horticulture. Archeological evidence for regional interaction ought to be continually compiled and added to the database developed by Wood. As the database expands, inferences and hypotheses in this historic context can be revised and updated.

Historic Preservation Goals, Priorities, and Strategies

Most of the summer earthlodge villages in the SMRSU escaped total destruction and inundation when Lake Oahe was constructed. This is because the summer villages are typically on terraces elevated high enough above the level of the upper reaches of the reservoir to escape inundation. Further, many village sites are above the upper end of the Lake Oahe pool along one of the few stretches of the Missouri River in the Dakotas where the valley bottomlands have not been inundated. However, wave action at times of high pool levels has had adverse effects on sites in Emmons County where profile exposures of house floors, refuse pits, and midden areas have invited vandalism and uncontrolled relic hunting. The Missouri River valley archeological research sponsored by the SIRBS was intended to salvage valuable information that would enable better understanding of the prehistoric Village cultures as well as to amass study collections. Post-SIRBS surveys have identified additional eroding sites which previously were unknown and which hold additional valuable information. Ralph S. Thompson suggests salvage work should be conducted at some of these sites for the same reasons and purposes that the SIRBS conducted the earlier work. It is a matter of continuing responsibility for heritage resources in the public domain. Developments have destroyed or severely impacted many villages north and south of Bismarck. There is a need for resurvey of village locations (e.g., Metcalf 2001) in order to evaluate significance and inform landowners of the presence of these resources and the probability of burials at those locations.

Two sites in dire need of attention are 32EM104 which is ca. 1.25 mi south-southwest of Little Beaver Creek Bay and the McKnight Ranch site (32EM5), also known as the Buffalo Corral or Big Beaver Creek site. Ralph S. Thompson noted that these two sites have been in and out of the water with pool level fluctuation, and he suggests that two house features should be salvaged at each site before they are lost forever.

There is a need to review and summarize the mortuary practices of prehistoric and protohistoric Village peoples for preservation planning purposes. It especially would be helpful for the community of cultural resource planners to be able to identify the settings where graves can be expected so that such places can be carefully considered in projects that will alter the natural landscape. Burial sites need to be protected. When disturbances

are eminent, human remains need to be salvaged, scientifically analyzed, and identified as to antiquity, ethnicity, and tribal affiliation. In the best of worlds, it would benefit science and tribal histories if scientists and Native American tribal culture experts work together to maximize information potential from burials that cannot be protected from disturbance.

Equestrian Period

The Equestrian Period spans the century from AD 1780-1880 during late protohistoric and historic times subsequent to the introduction of the horse and the arrival of Euro-American trade goods (cf. Secoy 1953). This period which witnessed Euro-American exploration and Fur Trade period expansionism provides the first written records documenting ethnic or tribal differentiation among the various nomadic societies such as the Yanktonai Dakotas who occupied part of the SMRSU at that time (cf. Warren 1986:147).

Paleo-Environmental Modeling

Tree ring studies from oak trees near Bismarck (Will 1946) indicate dozens of droughty periods alternating with period of favorable precipitation over the past 500 years. While very specific responses of particular cultural groups to such environmental changes may seldom if ever be identifiable archeologically, it ought to be possible to explicate ranges of general cultural responses or adaptations. Did a significant drop in effective moisture mark the end of the Little Ice Age early in the Equestrian period?

Cultural Chronology

The cultural chronology for the Equestrian Period presented here is based primarily on results of ethnohistoric research in conjunction with a few excavated sites such as Ice Glider (32OL110) reported in the literature (cf. Wood ed. 1986). The inception of the Fur Trade coupled with the introduction of the horse gave rise to a new Native American adaptation—nomadic equestrianism. Robert Warren (1986:148) has suggested that 19th century Yanktonai Dakota movements can be bracketed into three arbitrary time periods which coincide with the arrival of Euro-American trade goods and the horse to the region: First (1780-1810), Middle (1811-1830), and Third (1831-1860). Thiessen (1987, 1993) discusses four periods of Fur Trade development based largely on concepts first outlined by Ray (1974, 1978):

1) Initial indirect trade period (ca. 1600-1740). This marks the initial introduction of Euro-American trade goods to the Upper Missouri River, primarily through indirect contacts with French traders based out of Montreal (cf. Wood and Thiessen 1985).

2) Intermittent direct trade period (ca. 1740-1790). The inception of this period coincides with the first documented Euro-American contact (cf.

Howard 1976; Smith 1980). Horses originating from Southwestern sources arrived during this time.

3) Frequent direct trade period (ca. 1790-1822). Trade goods and horses become more common with increased contacts with Euro-Americans.

4) Final local trade period (ca. 1822-1860). The establishment of fur trade posts such as Fort Clark in the region operationalized the mechanics of local trade prior to the establishment of reservations (cf. Abel 1932; Howard 1976).

This type of chronological scheme appears to hold promise for temporally classifying both Plains Village and Equestrian Nomadic sites in the SMRSU, provided that representative samples of trade materials can be collected using fine-screen recovery during testing and major excavations. The issue of differentiating Mandan, Hidatsa, and Arikara stone circle sites from those of the Middle Dakota remains to be resolved. However, studies such as that conducted by Warren (1986) for Ice Glider which tie together material culture, subsistence orientation, and ethnohistory are most fruitful for addressing this issue.

Settlement Behavior

The settlement practices of the various Equestrian Nomadic groups who used this area during protohistoric and historic times are thought to have been heavily influenced (if not mandated) by social, economic, and environmental factors (cf. Hanson 1983). Stone circle sites were well represented on the Coteau east of the river along the Northern Border Pipeline transect (cf. Root et al. 1983). Most ring sites are inferred to have been temporary camps occupied by prehistoric Woodland and Plains Village peoples in seasonal hunting-and-gathering modes. However, many were surely constructed by equestrian nomads and equestrian villagers. These sites are recorded primarily along ridges or hill crests, often with commanding views of the surroundings. Incomplete ring courses at stone circle sites along with intra-ring artifact density measures can yield information concerning site reuse (Billeck 1983a). It has become clear that some sites containing large numbers of ring features represent locations which were used recurrently (cf. K. Deaver 1985; Deaver and Deaver 1987). Howard's (1976) transcription of the John K. Bear Yanktonai Winter Count makes mention of annual reuse of certain locations (cf. Binford 1983b:45-46). How did protohistoric and historic Equestrian Nomadic settlement behavior differ from that of prehistoric nomadic hunter-gatherers?

Native Subsistence Practices

Equestrian Nomadic subsistence practices involved hunting principally bison, plus deer and pronghorn, supplemented by foraging for wild plant foods such as prairie turnip *(Psoralea esculenta)* (cf. Denig 1961:10-13; Reid 1977). The Ice Glider site (32OL110) reported by Warren (1986) provides information for one of the few analyses of excavated faunal remains from an Equestrian Nomadic component in the state. The

faunal sample is dominated by bison, deer, and elk along with smaller mammals, birds, and freshwater mussels (Warren 1986:Table 17). Horse bone was also well represented in the aggregate. Unfortunately, floral remains were not recovered to provide complimentary information concerning the role of plant foods in the diet. What differences should be expected in floral remains recovered from Equestrian Nomadic versus Plains Village winter residential bases?

Technologies

During late prehistoric times, Plains Woodland and Plains Village societies alike experienced varying degrees of cultural change associated with shifts in settlement and subsistence practices. For instance the Cheyenne, once an earthlodge village-dwelling people, adopted a nomadic lifeway (cf. Wood 1971). After the introduction of the horse, they shifted to a full-blown Equestrian Nomadic lifeway. The well-developed prehistoric Cheyenne Plains Village ceramic technology was largely given up in the transition to nomadism.

Following Euro-American contact, metal tools replaced stone, ceramic, shell, and bone implements in native technologies to a large degree (cf. Hanson 1975; Wood ed. 1986, various chapters). The determination of cultural or ethnic affiliation for many post-contact artifact assemblages based solely on stylistic traits still is evolving. Some items of ceremonial or domestic origin exhibiting specific decorative or stylistic traits may hold information pertinent to this problem. For example, particular decorative motifs inscribed on ice gliders were certainly culturally prescribed (Warren 1986). The difficulty lies in linking these stylistic motifs with the sociocultural groups or associations that used them.

Artifact Styles

In the James River SU, there is a Plains Village archeological complex which first appeared about AD 1200 and continued into protohistoric times in the form of the Stutsman focus as defined by Wheeler (1963). A diagnostic trait of this complex is Buchanan Flared Rim ware as defined by Wheeler. This ceramic makes up 30% of the sample of 530 vessels from the protohistoric Hintz site (32SN3), but it accounts for 100% of the smaller samples from some of the earlier sites. The Plain and Tool Impressed types of Knife River ware may be the latest expression of this pottery. The combination of (1) the occurrence of these ceramics in both the Upper James River and Knife-Heart regions, (2) Hidatsa oral traditions saying the Awaxawi Hidatsa occupied parts of southeastern North Dakota, and (3) the similarity of circular houses with oblique entryways at Hintz and the Amahami site (32ME8) may indicate a possibility that the James River Plains Village materials represent the material culture of the prehistoric Awaxawi Hidatsa (cf. Gregg 1988). What artifact styles of the Equestrian Period are diagnostic of particular tribal groups or subgroups?

Regional Interaction

Culture changes attendant to the adoption of horses likely resulted in modifications of many long-standing patterns of social interaction and trade on the Northern Plains (cf. Wood 1980), particularly those between the Plains Villagers and their non-village neighbors. Then, following decimation and near extinction by epidemic disease, formerly prominent ethnic groups such as the Hidatsas were no longer any match for rival horse mounted bands of Middle Dakota such as the Yanktonai (cf. Abel 1932). Intergroup hostilities accelerated during the 19th century. In Village sites occupied during the Equestrian Period, what is the archeological evidence of trade with non-village groups from the Northwestern Plains and the Northeastern Plains?

Historic Preservation Goals, Priorities, and Strategies

Artifact content and information potentials ought to be assessed at a sample of Equestrian period sites. Any site with potential to add information to these contexts should be considered eligible for listing in the NRHP. Develop approaches for distinguishing between protohistoric and Equestrian Nomadic campsites. Continue to review historical records and documents, teaming with tribal historians whenever possible, to provide insights into this period.