The Garrison Study Unit

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The Missouri valley in North Dakota upriver from Garrison dam to the Montana border has witnessed all the state's prehistory. Diagnostic artifacts are reported dating from Clovis times. The long east-west segment of the valley has vast areas of north-facing wooded slopes and draws which provide cover for an abundance of game animals and furbearers. This setting, including the river, tributary stream valleys, and upland grasslands, offered a reliable resource base for hunting and gathering.

Description of the Garrison Study Unit

The Garrison Study Unit (GSU) is in the northwestern part of North Dakota. Montana and Saskatchewan border it to the west and north. It covers an area of 8,063 mi^2, comprising all or parts of eight counties: Burke, Divide, Dunn, McKenzie, McLean, Mercer, Mountrail, Ward, and Williams. Figures 6.1 and 6.1A are maps illustrating the Study Unit (SU). A complete listing of townships included in the SU is presented in Table 6.1.

Physiography

The SU lies within the glaciated Missouri Plateau Subsection of the Missouri Plateau Section of the Great Plains Physiographic Province (Fenneman 1931; Hunt 1974). Missouri River valley portions of the SU are included in the Missouri River Trench District. But most of the SU is made up of Missouri Coteau and Coteau Slope terrain. Land outside of the Trench beyond the right bank of the river is part of an unnamed district of the Glaciated Missouri Plateau Subsection (Bluemle 2016; Fenneman 1931; Wyckoff and Kuehn 1983:Figure 4.11).

Topographically, the Coteau Slope is characterized by gently rolling hills dissected by numerous rivers and creeks which drain to the Missouri River (now referred to as Garrison Reservoir or Lake Sakakawea). Knob-and-kettle glaciated terrain with many sloughs and potholes and other glacial features are typical on the Missouri Coteau proper. These features were formed by stagnation moraines, end moraines, and ground moraines during glacial times.

Figure 6.1: Map of the Garrison Study Unit.

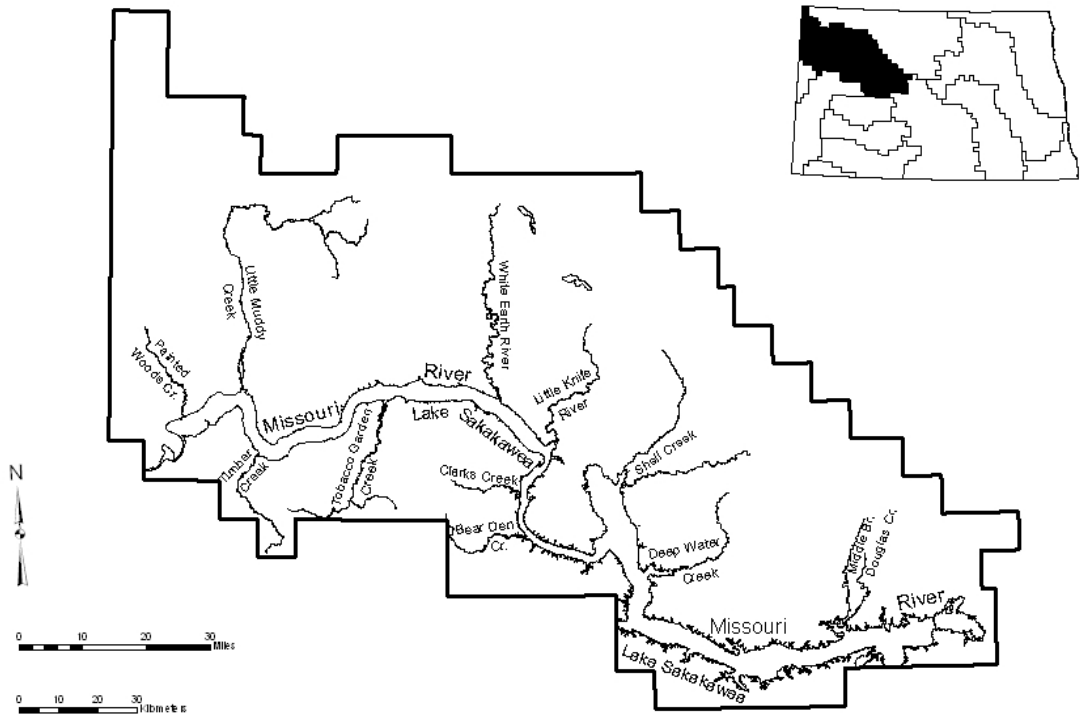

Figure 6.1A: Shaded Relief Map of the Garrison Study Unit.

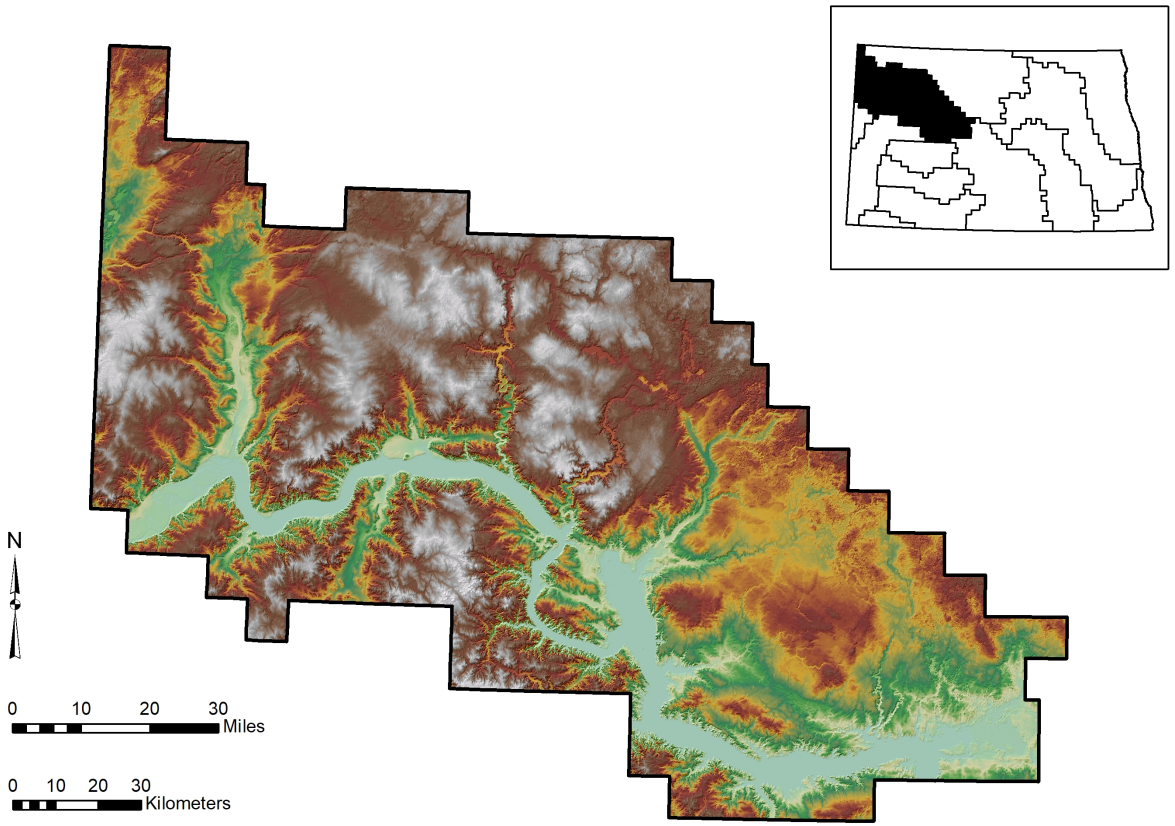

Table 6.1: Townships in the Garrison Study Unit.

TOWNSHIP	RANGE
146	86
146	87
146	88
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147	82
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TOWNSHIP	RANGE
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151	83
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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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164	103

The Missouri River valley has been modified by the man-made impoundment of the waters of Lake Sakakawea behind Garrison Dam. Construction of the dam was completed in 1953. The Missouri River Trench once consisted of floodplain, older river terraces, breaks terrain, and uplands. These features can still be found today in the extreme western portion of the SU at the headwaters of the reservoir where low-lying alluvial landforms remain above pool level. However, in most parts of the valley along the Lake Sakakawea shoreline, only portions of the breaks and uplands have not been flooded (cf. Reid et al. 1988).

Drainage

The westernmost portion of the GSU is within the Big Muddy Creek basin (of Montana), but the Big Muddy drains southward to the Missouri, so, even though the Big Muddy basin may be somewhere near the size of basins such as the Knife which are considered individually as SU, only a small part of the Big Muddy basin is within North Dakota, and it is categorized as part of the GSU. Drainage along the northern edge of the GSU is demarcated a little to the south and west of the Missouri Escarpment in a zone which approximates the location of the subcontinental divide. All streams and creeks located south and west of this zone flow southward to the Missouri River and the Mississippi River system, ultimately draining to the Gulf of Mexico. Major named streams that tributary to the left bank of the river, from west to east, include Painted Woods Creek, the Little Muddy River, White Earth River, Little Knife River, Shell Creek, Deepwater Creek, and the three main branches of Douglas Creek. This SU also has several significant named drainages lying south and west of the Missouri River that are tributaries to its right bank. These include (from west to east) Timber Creek, Tobacco Garden Creek, Clear Creek, and Bear Den Creek.

The Missouri Coteau portion of the SU is essentially “undrained” or “internally” drained. Water collects from rainfall, snowmelt, and ground water in the plentiful sloughs and potholes. Two of the larger named water bodies are White Lake and Powers Lake.

Climate

The present-day climate is of the northern continental type. Temperatures fluctuate extremely by season with warm summers and cold winters. Temperatures in Mercer County have reached 108°F during summer hot spells and have fallen to as low as -48° F during winter as the result of frigid Arctic air pushing southward over the region (cf. Jensen 1972). The average winter temperature is 12° F, while the summer mean hovers around 67° F.

Precipitation averages about 16 inches annually, most of which falls as rain during the spring and summer (NDSPB 1939a). Prevailing winds are from the west-northwest throughout the year with the highest average readings around 13 mph. Brief periods of stronger winds and gusts to 35 or 40 mph are not uncommon. The frost-free growing season averages about 115 days.

Landforms and Soils

The landforms in the SU consist of glaciated uplands, breaks terrain, valley wall sideslopes and footslopes, draws (or coulees), alluvial terraces, and floodplains in the bottomlands of the Missouri and some of the larger tributaries. Archaeological sites are found on all these landforms.

Natural Resources Conservation Service (NRCS) official soil survey resources are available online (NRCS 2021 a, b).

- Electronic Field Office Technical Guide: https://efotg.sc.egov.usda.gov/#/
- Web Soil Survey: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm

Flora and Fauna

Descriptions of the Missouri valley by early explorers such as Lewis and Clark, and later by Maximilian, provide first-hand accounts of the natural environment of the SU for times prior to the massive modifications caused by European immigrants. Detailed reconstructions of floral and faunal resource availability can be calculated by studying those sources in combination with the works of the ecological, botanical, and zoological specialists of the mid-1900s.

The GSU lies within the Northern Temperate Grassland biome (Shelford 1963:329). The semiarid climate results in the development of a mixed grass prairie association here (Dodds 1979; Whitman and Wali 1975). The mixed grass prairie is dominated by blue grama grass, needle-and-thread grass, and western wheatgrass. This grassland provided good habitat for bison and pronghorns (Shelford 1963:344). Gallery forests grew along the Missouri River on the floodplain and provided habitat for white-tailed deer and small mammals such as otters and porcupines. Transition zones between the grasslands and floodplain forests offered additional habitat diversity. Hardwood draws, for example, provide conditions for the growth of bur oak, green ash, and juniper. This vegetation provides cover for a variety of game animals.

Overstory vegetation on the floodplain was typically dominated by cottonwoods, box elder, elm, and willows in pioneer and early succession situations. Oak and ash would come to dominate mature stands on the floodplains and along the edges of terraces (Burgess et al. 1973:36). Understory vegetation included the food plants chokecherry, buffaloberry, gooseberry, and serviceberry. Johnson et al. (2012) provided an updated statement on vegetation change along the Missouri River.

Overall, the faunal diversity in the GSU at contact time was as great as or greater than anywhere in the state. The reliability of the Missouri River as a water source combined with the floral diversity and cover of the gallery forests and breaks zones provided habitats for many kinds of animals. Creatures which could be hunted for meat, hides, feathers, teeth, bones, etc., included bison, elk, pronghorns, white-tailed deer, mule deer, grizzly bears, mountain lions, bighorn sheep, wolves, coyotes, foxes, bobcats, otters, badgers, porcupines, prairie dogs, weasels, mink, cottontail rabbits, jackrabbits,

ground squirrels, golden eagles, bald eagles, hawks, owls, pelicans, magpies, prairie chickens, grouse, and a variety of waterfowl, fish, turtles, and mussels (cf. Brown et al. 1983).

Other Natural Resource Potential

Glacial fill and alluvially transported gravels abound as important stone resources at places within the GSU. In various locations there may be Knife River flint (KRF), quartzites, jaspers and cherts, agatized woods, Yellowstone agate, porcellanite, basalt, granite, and even limestone. Bedrock materials such as pigment stones and sandstone are also found. A detailed description of the lithic resources of the Mondrian Tree site (32MZ58) locality in the western portion of the GSU can be found in Toom (1983c).

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 sweat bathing (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).

In 2021 the South Dakota State Historical Society published *Tool Stone Found at South Dakota Archaeological Sites* edited by Renee M. Boen. The document contains information, photographs, and maps on raw stone materials found at archaeological sites in South Dakota and will be a valuable reference for archaeologists in North Dakota as well. Craig Johnson's *Chipped Stone Technological Organization: Central Place Foraging and Exchange on the Northern Great Plains* (2019) is likewise a valuable resource regarding lithics resources and provides important research questions for future studies.

Overview of Previous Archaeological Work

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

Inventory Projects

As of 31 December 2020, there were 5,106 archaeological sites and 2,848 archaeological site leads and isolated finds in the state site files for this SU. With its area of 8,063 mi^2, there is one site recorded for every 1.6 mi^2. When including site leads/isolated finds there are 7,954 recorded resources or one recorded for every 1.0 mi^2. The GSU ranks second, after the Knife River SU, out of all the SU in site density.

As of 31 December 2020, 3,497 Class III cultural resource inventories in the GSU are in the manuscript collection at the Archaeology and Historic Preservation Division of the State Historical Society of North Dakota (SHSND). Seven hundred ninety-nine

cultural resource reports were submitted from 5 August 2015 to 31 December 2020. Eighteen percent of the Study Unit has been surveyed for cultural resources. Only the Little Missouri and Yellowstone study units have a higher percentage of areas surveyed. It should be noted that inundation of vast areas of Missouri bottomlands by the waters of Lake Sakakawea have hidden/destroyed many sites which would be found by modern inventories. Cultural resource management site inventory work preceding reservoir construction was completed under difficult circumstances prior to the passing of the National Historic Preservation Act.

Table 6.2 presents the recorded feature types by landform for the GSU. Stone circles, cairns, and other rock features account for 74% of the site records. Cultural material scatters account for 25% of recorded sites. The low number of sites recorded in floodplain settings cannot be representative of the actual intensity of use of that landform in prehistory. The biased record can be accounted for by (1) destruction of floodplain sites by river meandering, (2) deep site burial in alluvial floodplain sediments, and (3) inundation of sites beneath the waters of Lake Sakakawea. Table 6.2 indicates 76% of recorded sites are located on hill/knoll/bluff, ridges, and upland plain.

Table 6.3 is a tally of identified cultural/temporal affiliations of recorded archaeological resources. There are 21 Paleo-Indian (Paleo) components indicated in the database and include Folsom, Plano (Cody) and Parallel Oblique Flaked. Although not indicated in this table Clovis, Goshen, Plainview, and Agate Basin-Hell Gap components are also present in the GSU. Components identified in the data base for Archaic (35.8%), Woodland (21.2%), and Late Prehistoric (39.7%) sites are well-represented. It is clear cultural/temporal affiliations have not been coded to the extent possible. Many site forms have not been updated after additional archaeological investigation.

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 NS 1856 Maps (Callaway and Wood 2012), and the 1893 Missouri River Commission maps.

The GSU has a long history of archaeological investigation paralleling in many ways that of the Southern Missouri River SU. In 1907 Orin G. Libby, Secretary of the State Historical Society of North Dakota, commissioned Sitting Rabbit, a Mandan Indian, to paint a map of traditional Mandan and Hidatsa sites along the Missouri (Thiessen, Wood, and Jones 1979).

Table 6.2: Feature Type by Landform for Archaeological Sites in the Garrison Study Unit, 31 December 2020.

SU 6	Cairn	Conic	CMS	Eagle	Village	Earth	Fort	Grave	Hearth	Jump	Mound	ORF	Pit	Quarry	Art	Shelter	Circle	Trail	Misc	TOTAL
Alluvial fan	2		7						1								3			**13**
Beach/ Riverbank	7		68	1					4			3	2	1			15		3	**104**
Beachline (glacial)	7		3				1	1	1			3	1		1		6	1	1	**26**
Butte	24		14	1	1				1			5	6		2		9			**63**
Canyon	2		4														4			**10**
Delta			1																	**1**
Draw	21		44	1				1	3	1		7	1	1			30		2	**112**
Floodplain	5		24		2			2	3		1	7	1				16		1	**62**
Hill/Knoll/ Bluff	713		339	7		4		30	20	2	8	241	52	2	6	2	953	3	17	**2399**
Island	1		2														2			**5**
Other	1		7														6			**14**
Ridge	822		355	21		3	1	13	27		1	232	79	6	1	2	1172	1	15	**2751**
Saddle	34		19					1	1			17	2	1			62			**137**
Spur	91		59	2		1		2	4		1	31	5	1			186		1	**384**
Swale	11		7									4					16			**38**
Terrace	82	1	307	4	11	5	1	3	45	1	4	41	20	2	1	1	213	7	8	**757**
Upland Plain	165		133	1			1	7	4	1	5	59	25			1	287	1	11	**701**
Valley wall foot slope	7		31	1	5			1	5		1	5	6	2	1		24	2		**91**
TOTAL	**1995**	**1**	**1424**	**39**	**19**	**13**	**4**	**61**	**119**	**5**	**21**	**655**	**200**	**16**	**12**	**6**	**3004**	**15**	**59**	**7668**

Conic=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

Cultural/Temporal Affiliation

Table 6.3: Cultural/Temporal Affiliation of Archaeological Resources in the Garrison Study Unit, 31 December 2020.

Paleo-Indian	
Unspecified	11
Folsom	1
Plano (Cody)	8
Parallel-Oblique Flaked	1
Total	**21**
Archaic	
Unspecified	65
Early Large Side-Notched	4
Oxbow	9
McKean/Duncan/Hanna	36
Yonkee	3
Pelican Lake	54
Total	**171**
Woodland	
Unspecified	7
Early Woodland	2
Sonota/Besant	61
Avonlea	10
Middle Woodland	7
Late Woodland	17
Total	**104**
Late Prehistoric	
Unspecified	149
Devils Lake/Sourisford	1
Northeastern Plains	1
Plains Village	24
Plains Nomadic/Equestrian	20
Total	**195**
TOTAL	**491**

George Will researched and reported on the village cultures of the Upper Missouri River Valley for four decades. Will (1924) provides a summary of village sites he had recorded. Later Will and Hecker (1944) published a synthesis of archaeological surveys and excavations at villages of the Upper Missouri River Valley based on some 20 years of inquiry. Their work provides initial descriptions of prominent earthlodge villages in the GSU such as Rock Village, Yellow Knife, Nightwalker's Butte, Crows Flies High, Jacobson, Indian Hills, Like-A-Fishhook, Fort Berthold I and II, Kipp's Trading Post, Midipadi Butte, and White Earth Creek which were subsequently investigated in greater detail.

Other reported early archaeological survey work was undertaken by Hecker (1937-1950), an avocational archaeologist employed by the Works Progress Administration (WPA). Fortunately, Hecker summarized his lifetime of discoveries, insights, and inferences in a series of written reports. Hecker's documentation has been compiled into one manuscript that is on file at the Archaeology & Historic Preservation Division of the State Historical Society of North Dakota (see Manuscript No. 019175). In addition to recorded information, Hecker collected samples of artifacts for the SHSND from several sites he visited.

Several site reconnaissance and mapping projects were carried out during the early decades of the 20th century. 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 & State Museum, Bismarck, North Dakota.

Extensive ethnographic undertakings provide much information regarding the Mandan, Hidatsa and Arikara (cf. Bowers 1930, 1948, 1950, 1963; Gilman and Schneider 1987; Weitzner 1979; Wilson 1910, 1916, 1917, 1924, 1928, 1934, 1971). Alfred Bowers and Gilbert Wilson developed close ties with peoples on the Fort Berthold reservation. Melvin Gilmore, a pioneering ethnobotantist, published on plant use and other cultural content by the Arikara, Dakota, Lakota, and eight other tribes (Gilmore 1913, 1916, 1917, 1919, 1920, 1921, 1922, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1933, 1977). As curator at the State Historical Society of North Dakota for seven years, Gilmore developed close relationship with Arikara elders. Francis Densmore worked with the Mandan, Hidatsa, Cheyenne, Sioux, and many other tribal groups and her publications and Graphophone recordings preserved important cultural traditions (1918, 1923, 1926, 1936, 1937). Mandan and Hidatsa stories and ceremonies were collected by Martha Warren Beckwith (1938).

Following World War II and the proposed construction of earthen dams along the Missouri River, there was resurgence in archaeological activity. Kivett (1948) provided a preliminary statement concerning archaeological and paleontological resources in the proposed Garrison Reservoir. A total of 70 archaeological sites were reported. This initiated a long-term research program conducted by the Smithsonian Institution River Basin Surveys (Banks and Czaplicki 2014; Thiessen 1999). Follow up studies by George Metcalf and others (Metcalf 1951; Metcalf et al. 1953) inventoried known cultural

resources in the reservoir. Information was provided by many Native American consultants. Reports resulting from this work and collections from numerous sites continue to be studied today.

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, several site inventory projects were conducted (Swenson et al. 2016:65-84).

During the mid-1970s, there was survey work along stretches of the eroding Garrison Reservoir shoreline. In the summer of 1974, 51 sites were found during shoreline survey work (Haberman and Schneider 1975). The following year additional survey work was completed at Lake Sakakawea. Gary Leaf (1976) reported on 15 new sites around the reservoir.

Survey work conducted between 1979 and 1981 along the route of the Northern Border Pipeline resulted in the recording of eight previously unknown archaeological sites and four find spots in McKenzie and Williams counties (Root 1983y:626). A ca. 20 km long segment of the pipeline transects the GSU. Results of the survey indicated, not surprisingly, that prehistoric use of the immediate Missouri River valley area was more intensive than areas away from the valley. “Permanent water supply, the gallery forests, hardwood draws in the river breaks, and abundant plant and animal resources are factors which led to the relatively extensive settlement in this region” (ibid.:657). One of the most important sites found by this survey was the Mondrian Tree site (32MZ58) along the right bank of the river at a location where an ephemeral tributary stream valley enters the main valley (cf. Toom and Gregg 1983).

In 1981, 24 prehistoric sites were recorded in 4,000 acres of recreation area land along the Garrison shoreline (Van Hoy et al. 1982). In 1982, Science Application and Overland surveyed 7,390 acres and identified 56 archaeological sites in Mercer and McLean counties. During 1983, Overland Associates recorded 22 archaeological sites in some 16,000 acres along Lake Sakakawea shoreline in Williams and McKenzie counties (Noisat et al. 1986).

The Bureau of Land Management’s (BLM) sampling survey of western North Dakota coal study areas (CSAs) covered 63 sampling units (each 160 acres in size) in the GSU within the Hanks and Sand Creek CSAs. The surveyed areas lie north of the Missouri River northwest of Williston, primarily in Williams County, but including two sample units in extreme southwestern Divide County (Metcalf et al. 1988:5). There were 100 sites recorded yielding a site density of one per 100 acres; 41 isolated artifacts were also recorded.

In a 1987 intensive survey of the federal “take area” along the Lake Sakakawea shoreline in Mercer County, 154 sites were recorded in 9,200 acres yielding one site per 60 acres overall (Floodman 1988). The area surveyed was primarily “upland rim” terrain and not river bottomlands or terraces.

During 1986 and 1987, an approximate 35 mi^2 area along Lake Sakakawea in Dunn County was surveyed. Winham et al. (1987) recorded 163 new sites and revisited 32 previously known ones. A number of these sites fall within the Knife River SU (see maps and lists of legal descriptions for SU boundaries). A variety of cultural properties were evaluated including cultural material scatters, lithic scatters, earthlodge villages, isolated historic Native American trunk burials, and former cemetery locations.

Ethnoscience, Inc. has conducted several block inventories for The Coteau Properties Company's expansion of mining operations in Mercer County (Boughton et al. 1994, 2000; Strait et al. 2003; Walker-Kuntz et al. 1998). Table 6.4 provides a snapshot of these projects.

Table 6.4: Large-scale (1,000+ acres) Class III Inventories Conducted in the Garrison River Study Unit, 31 December 2020.

Block Survey	Area (Acres)	Date	# Of New Archaeological Sites	MS #
North Mine Extension	4,520	1994	59	6245
Permit Area D	1,840	2000	130	7610
Permit Area H	2,380			
West Permit Area	18,600			
Area 2 North	6,510	2003	16	8464
Coteau	1,280	2008	29	10509
Sandpiper	1,702	2014	14	15789
Basin Electric	1,101	2020	16	18977

There are 3,497 cultural resource reports that have been produced for the GSU as of 31 December 2021. Seven-hundred ninety-nine were submitted to the ND SHPO from 5 August 2015 to 31 December 2020. The pace of archaeological investigation in off-Trench locations within the GSU accelerated at a great rate between the mid-1970s and the late 1980s, and again in the 2010-2015 generally due to oil booms. Between 1990 and 5 August 2015 there have been 2,205 inventories conducted within the GSU. Most large-scale inventories were conducted related to energy production and transmission, transportation, and water projects.

The Corps of Engineers has conducted numerous large-scale inventories of lands they manage in the GSU (Table 6.5). Much of their land has been surveyed multiple times. The tendency has been to monitor site conditions rather than determining eligibility of archaeological resources to the National Register. This unfortunately has led to the destruction/damage of multiple resources rather than gathering information regarding these endangered sites.

Table 6.5: Large-scale (1,000+ Acres) Class III Inventories Conducted in the Garrison River Study Unit on USACE-Managed Lands along Lake Sakakawea.

Area (Acres)	Date	# Of New Archaeological Sites	# Of Previous Archaeological Sites Recorded	Author(s) & MS #
Unknown	1974	51		Haberman and Schneider (1975) MS 113
Unknown	1976	15		Leaf (1976) MS9
4,000	1981	26		Van Hoy et al. (1982) MS 3821?
7,390	1982	55	151	Kalia (editor) (1982) MS3315
16,400	1983	22		Noisat et al. (1986) MS 4294
9,200	1987	156	26	Floodman (1988) MS 4601
22,269	1986; 1987	163	32	Winham et al. (1987) MS 4293
17,280	1985; 1986	176	48	Winham et al. (1987) MS 5325
36,060	1989; 1989	438	35	Lueck et al. (1992) MS5706
24,293	2008	34	18	Berg et al. (2008) MS 15572
21,450	2009; 2010	17	128	Schleicher et al. (2011) MS 15540
13,590	2010	4	85	Baer et al. (2010) MS 15652
30,866	2009	16	153	Hurlburt (2010) MS 15542
15,819	2011	39	43	Ryan et al. (2011) MS 13016
21,862	2013	5	119	Wandler et al. (2013) MS 15580
1,224	2014; 2015	0	147	Clark et al. (2016) MS 17226

Formal Test Excavation Projects

Archaeological investigations were undertaken by Will and Hecker in the first half of the 20th century. The Smithsonian Institution River Basin Survey archaeologists conducted excavations at multiple sites in response to the proposed Garrison Reservoir (Banks and Czaplicki 2014; Theissen 1999). Some of the sites excavated that are in the GSU include Grandmother's Lodge (32ME59) (Woolworth 1955), Rock Village (32ME15) (Hartle 1960), Star Village (32ME16) (Metcalf 1963), Fort Berthold I and II (32ML2) (Smith 1972), and Like-A-Fishhook (32ML2) (Smith 1972). These are all considered in the major excavation section.

The first formal testing work following the passing of the National Historic Preservation Act is thought to be undertaken at the Moe site (32MN101). Schneider

(1975) could not find evidence of intact Paleo cultural deposits at this location where Clovis, Folsom, and other Paleo-age artifacts had been collected from the beach of Lake Sakakawea. Other components that had not eroded were identified.

Next, testing work was undertaken at 32DU2, the "Highway 8 site" (Good and Hauff 1977) later renamed the Midipadi Butte site (Lippincott 2007). Excavation of two test units and limited hand probing revealed intact cultural deposits along with the surface-visible remains of at least 15 depression features. A preliminary Plains Woodland cultural affiliation was ascribed to the site based on the recovery of a Besant side-notched point and thick cord roughened potsherds. Five years later, more in-depth testing was conducted. As a result of these investigations, Kuehn et al. (1982) renamed the site "Midipadi Butte" more in accord with its probable Hidatsa cultural affiliation (cf. Will and Hecker 1944:116). Cultural materials recovered included predominantly Knife River phase ceramics along with various chipped and ground stone tools, and metal and glass trade materials of Euro-American origin. Unfortunately, deep tests were not dug to bedrock to prospect for earlier Plains Archaic and Plains Woodland components. Incidentally, Midipadi Butte may have been the scene of some of the earliest testing work conducted in the GSU. Kuehn et al. (1982:11, citing Metcalf 1963:28-29) allude to vague descriptions of prior testing by SIRBS researchers.

The Garrison Tipi Ring site (32ML117) was tested in 1978. Based on that testing project the site was suggested to have been occupied at least twice by nomadic peoples. Major activities at the site were suggested to be food preparation and stone tool manufacture (Good and Dahlberg 1979:10).

A single stone circle was tested in the path of U.S. Highway 83 involving test units inside and outside of the stone circle (Peterson 1981).

In 1979 and 1980, there was testing at the Mondrian Tree site (32MZ58) in an alluvial fan-Missouri River terrace setting near the Missouri-Yellowstone confluence along the proposed route of the Northern Border pipeline. Roberson (1980) reported shallowly buried cultural deposits of prehistoric and historic age. However, subsequent testing and major excavations revealed a complex, deeply stratified site containing Plains Archaic, Late Plains Woodland/Plains Village, and Euro-American components (see Major Excavation Projects section below). Testing was also undertaken at five additional sites along the route of the Northern Border pipeline in the GSU (Root 1983k, m, p, r, u).

Two stone feature sites were tested in relation to county highway 1806 (Schreiner 1982). Morast Big Bull (32ME503) had 11 tipi rings, one rock cairn, and one depression. Eleven test units were excavated, and the site was photogrammetrically mapped. Stern Road Cut (32ME506) consisted of two stone circles and seven test units were excavated and the site was photogrammetrically mapped.

Sixteen test units were placed in the Edna Mae site 32MZ369 for Northern Border Pipeline (Root 1983). The site is a large, general debris scatter. Temporally diagnostic points and ceramics indicate the site was occupied during the Middle and Late Plains

Archaic, Plains Woodland, and Plains Village/Late Prehistoric periods. On site activities included numerous extractive and maintenance tasks, such as processing large game, heavy duty plant processing, hide working, and wood, bone, and antler working. Soft hammer bifacial reduction was the predominant on-site KRF technological activity (Root 1983:182-183). Four excavation units were placed in the Sioux Crossing Site (32MZ559) (Root 1983:185). Plains Archaic and/or Woodland components with a variety of maintenance and extractive tasks are represented at the site.

Other sites in the GSU that were tested relating to Northern Border Pipeline in Williams County include 32WI27, 32WI28, 32WI149. Two excavation units were placed inside and outside this stone circle site (32WI27). The presence of FCR suggest a short-term habitation (Root 1983:66-67). Five rock cairns were also present at the site but not investigated. The Hardscrabble site (32WI28) is an extensive stone ring and rock cairn complex (Root 1983:68). Twenty-two test units were excavated to evaluate the site. A habitation function was suggested for the stone circles. The Jim Harp site (32WI49) consists of five stone rings, four cairns, and a lithic scatter. Fifteen excavation units were excavated to evaluate the site. A protohistoric component was suggested with most activities related to maintenance tasks of expediently manufactured, unpatterned tools with local raw materials. Hunting, tool manufacture and possibly animal butchering was also indicated (Root 1983:57).

At site 32MZ173 two stratified cultural components with ceramics were identified. The lower level was radiocarbon dated to AD 410 and has a Plains Woodland affiliation. The upper component is suggested as having a Plains Village affiliation based on the simple stamped ceramics and side-notched projectile point (Floodman 1984).

Three stone circle sites were tested in Mountrail County (Aivazian 1983). Sites 32MN147 and 32MN150 were single stone circle sites and at site 32MN150 a hearth was uncovered. Cultural temporal affiliation was not established for these two sites. At 32MN153 there were five stone circles identified and the site was postulated to have a Woodland component based on the recovery of one sherd. These sites were not recommended as eligible for the National Register of Historic Places.

Two test units and several auger probes were excavated at 32ME812 (Borchert 1986). This site had two stone rings and appeared to have at least two components. Further testing was recommended at this site.

Multiple components (Early Archaic and Besant) were identified at 32MZ721. Rings, cairns, drive lines, and a lithic scatter were present. Testing involved the excavation of 12 square meters and 45 shovel tests. Burned earth features, burned plant material and lithic debris and tools were recovered (Penny and Larson 1985).

Table 6.6: Formal Testing Projects in the Garrison Study Unit, 31 December 2020.

Year	First Author	Second Author	Title	Sites Tested	MS #
1977	Good, K.	J. Hauff	Archaeological Test Excavation of the Highway 8 Site, 32DU2, Garrison Reservoir, ND	32DU2	10
1979	Good, K.	J. Dahlberg	Archaeological Excavations at the Garrison Tipi Ring Site, 32ML117, McLean Co., ND: An Archaeological Salvage Project	32ML117	2514
1980	Roberson, W.		Archaeological Test Excavations at the Mondrian Tree Site (32MZ58) McKenzie Co., ND	32MZ58	1475
1981	Peterson, J.		An Archeological Test Excavation of a Stone Circle in the Path of US Highway 83 Construction., McLean Co., ND	32ML224	2478
1982	Schreiner, M.		Archeological Test Excavations-Sites 32ME503 and 32ME506--Mercer Co., Highway 1806	32ME503, 32ME506	3171
1983	Bass, S.		Testing Stone Circle Site 32MN140	32MN140	2861
1983	Aivazian, B.		Archaeological Excavations at 32MN143, 32MN147, & 32MN150, Mountrail Co., ND	32MN143, 32MN147, 32MN150	3316
1983	Root, M.	M. Gregg	Archeology of the Northern Border Pipeline, ND: Vol. 3, Test Excavations, McIntosh, Emmons, Morton, Stark, Mercer, Dunn, McKenzie, & Williams Co., ND – Volume 3	32MZ369, 32MZ559, 32WI27 to 28, 32WI49	3456
1984	Floodman, M.		Texaco Inc. Silurian 26-1 Archaeological Testing at Site 32MZ173 Preliminary Report	32MZ173	3438
1985	Artz, J.		An Interim Report on Archeological Investigations at 32ME788, South Shore, Lake Sakakawea.	32ME788	3571
1985	Kuehn, D.		A Report on Archaeological Evaluative Testing at Site 32ME812, Twin Buttes Road Improvement Project, Fort Berthold Indian Reservation, ND	32ME812	3871
1985	Penny, D.	T. Larson	Report of Test Excavations Carried out at 32MZ278, McKenzie County, ND	32MZ278	12996
1986	Floodman, M.		Preliminary Report Texaco, Inc., Silurian Unit 40-1: 32MZ721 Testing McKenzie Co., ND	32MZ721	1849
1986	Artz, J.	K. Schweigert	Southwest Pipeline Archeology: Testing & Evaluation of 15 Sites in Mercer and Dunn Counties, ND (Segments A, B-1, & B-2), Contribution No. 229	32ME788	3898

Year	First Author	Second Author	Title	Sites Tested	MS #
1986	Floodman, M.		Final Report of the Archaeological Testing of a Portion of Site 32MZ721 at the Texaco Inc. Silurian Unit #40-1 Well Location, McKenzie Co., ND	32MZ721	3925
1986	Floodman, M.		Preliminary Testing of Stone Circle Site 32MZ727 for the Texaco Inc., Silurian Unit #45-1 Well Location, Northeastern McKenzie Co., ND	32MZ727	3927
1986	Floodman, M.		E.P. Operating Company Fort Berthold Tribes 1-13: Final Report of Archaeological Testing at 32MZ798, McKenzie Co., ND	32MZ798	3928
1986	Floodman, M.		Final Report: Test Excavations at Site 32MZ748 on the Fort Berthold Indian Reservation, Eastern McKenzie Co., ND	32MZ748	3930
1986	Borchert, J.		Test Excavations at 32ME812 & 32ME813, Fort Berthold Reservation, Mercer Co., ND	32ME812, 32ME813	4099
1986	Christensen, R.	D. Kuehn	The Results of Archaeological Construction Monitoring on Twin Buttes Road, & Salvage Operations Conducted on the Harrier's Three Site (32ME841)	32ME841	4154
1986	Gnabasik, V.		Testing at Site 32WI50 Within the Proposed Campground Renovation Area at Lewis & Clark State Park, Garrison Dam/Lake Sakakawea Project, Williams Co., ND	32WI50	4182
1987	Persinger, R.	K. Schweigert	Archaeological Testing of Site 32WI40 & Historical Evaluation of Sites 32WI203 & 32WI205 Near Trenton, Williams Co., ND	32WI40	4423
1988	Winham, R.	E. Lueck et al.	Archeological Testing of Sites 32MN228 & 32MN331, White Earth Bay Area of Lake Sakakawea, Mountrail Co., ND	32MN228, 32MN331	4608
1988	Haury, C.	P. Picha et al.	Evaluation of Four Cultural Resources on the Southwest Pipeline, Dunn, Mercer, and Stark Co., ND	32ME797	4711
1989	Fox, R.		An Evaluation of Testing at 32WI309, the Site of Koch Exploration's Proposed Berger 23-14 Well Pad	32WI309	4709
1989	Banks, K.		Monitoring of Geotechnical Drilling at Site 32DU32/32ME617 Twin Buttes Water Treatment Facility & a Reassessment of 32MZ605 Four Bears Water Treatment Facility	32DU32, 32ME617, 32MZ605	4870
1989	Sanders, P.	K. Kempton	Archeological Evaluation of Fifteen Sites Located Along Lake Sakakawea, Dunn Co., ND	32DU132, 32DU714	4924
1989	Newberry, G.	G. Tucker, Jr.	Results of Evaluative Testing at Archaeological Sites 32MZ936 and 32DU909 Along the Figure 4 Road, Fort Berthold Indian Reservation, McKenzie and Dunn Counties, ND	32MZ936	5053
1990	Wermers, G.	J. Borchert	Evaluation of Four Sites Ross Road, Mountrail Co., ND	32MN398 to	4800

Year	First Author	Second Author	Title	Sites Tested	MS #
				399, 32MN445 to 446	
1990	Persinger, R.	R. Christensen	Archaeological Test Excavation at Skunk Creek Bay, Dunn Co., ND	32DU623 to 626	5059
1991	Sanders, P.	T. Larson	The 1989 Archaeological Investigations at 32ME797, 32ME799 & 32ME847 Along the Southwest Pipeline Project, Mercer Co., ND	32ME797	5463
1991	Lahren, L.		Evensvold: A Prehistoric Stone Circle & Cairn Site in Mountrail Co., ND (32MN448 & 32MN449)	32MN448, 32MN449	5563
1991	Späth and Christensen	R. Christensen	32ME254, Evaluation and Intensive Testing	32ME254	5798
1992	Olson, B.		Evaluative Testing at Site 32MZ679 For the Amerada Hess Pipeline McKenzie Co., ND	32MZ679	5746
1992	Olson, B.		Evaluative Testing at Site 32WI139 For the Amerada Hess Pipeline Williams Co., ND	32WI139	5747
1992	Christensen, R.		ND Highway 23 Archaeology: Evaluative Testing at 32MN395	32MN395	5964
1992	Christensen, R.		ND Highway 23 Archaeology: Evaluative Testing at 32MZ1089	32MZ1089	5965
1992	Olson, B.		Amerada Hess Corporation Natural Gas Pipeline Project Evaluative Testing, Monitored Grading & Emergency Salvage at Site 32MZ679 McKenzie Co., ND	32MZ679	6613
1994	Boughton, J.	L. Peterson	Testing & Evaluation of Prehistoric Sites Within the North Mine Extension Area, Mercer Co., ND	32ME1349 to 1350, 32ME1352, 32ME1358, 32ME1360	6347
1994	Stine, E.	A. Kulevsky	Garrison Wets, McLean Co., ND: Test Excavations of Twelve Sites	32ML226, 32ML228, 32ML231 to 233, 32ML858 to 863	6395
1995	Klinner, D.		Results of the Evaluative Testing of Site 32MN509 Mountrail Co., ND	32MN509	6407
1995	Kulevsky, A.	E. Stine	Limited Testing at 32DU80 Dunn Co., ND	32DU80	6497
1995	Christensen, R.		32MN508 Evaluation	32MN508	6616
1995	Larson, T.	R. Hilman	Results of Test Excavations at 32ME588, Mercer Co., ND	32ME588	6638

Year	First Author	Second Author	Title	Sites Tested	MS #
		et al.			
1996	Peterson, L.		Additional Testing at Six Prehistoric Sites Located Within the North Mine Extension Area in Mercer Co., ND	32ME1348, 32ME1372, 32ME1382, 32ME1394, 32ME1398, 32ME1417	6652
1996	Porter, D.	D. Klinner	Results of the Evaluative Testing of a Portion of Site 32MN512, Mountrail Co., ND	32MN512	6795
1996	Molyneaux, B.	N. Hodgson et al.	National Register Site Testing at Sites 32ML229, 32ML237, 32ML239, & 32ML243 at the National Guard Recreation Area, Lake Sakakawea, McLean Co., ND	32ML229, 32ML237, 32ML239, 32ML243	6831
1996	Christensen, B.		Archaeological Evaluation Site 32MN508	32MN508	6753
1996	Christensen, B.		32WI346 Evaluation Project No. NH-7-002(041)052	32WI346	6792
1996	Späth, C.		Skunk Creek Bay Access Road Improvement, Evaluative Testing of Five Sites on Tribal & Private Lands, Dunn Co., ND	32DU396, 32DU1153 to 1156	9508
1999	Olson, B.	G. Newberry	Final Report of Evaluative Testing of Sites Impacted by the Dakota Gasification Company CO_2 Pipeline: Mercer, Dunn, McKenzie, & Williams Counties, ND	32MZ791, 32ME1444, 32WI132, 32WI354	7299
1999	Morrison, J.		It's a Beautiful Day: Limited Testing of 32MN514, Mountrail Co, ND	32MN514	7359
1999	Good, K.		Evaluative Testing 32ME544	32ME544	7418
2000	Olson, B.		Dakota Gasification CO_2 Pipeline Project: Evaluative Testing of Site 32WI305	32WI305	7529
2000	Newberry, G.		Evaluative Testing at Site 32MZ1444 and an Isolate Location, McKenzie Co., ND	32MZ1444	7559
2001	Floodman, M.		The Clear Creek Project: Test Excavation at Archeological Sites 32MZ1474 & 32MZ1475, McKenzie Co., ND	32MZ1474, 32MZ1475	8117

Year	First Author	Second Author	Title	Sites Tested	MS #
2001	Boughton, J.	B. Fandrich et al.	Coteau Properties Company: Testing & Criterion D Evaluation of Prehistoric Sites Located in Permit Extension Areas D & H & the West Permit Area, Mercer Co., ND	32ME95 to 98, 32ME100, 32ME111, 32ME342 to 343, 32ME1284, 32ME1461 to 1463, 32ME1528	8531
2001	Bales, J.	C. Jackson, et al.	Garrison Local Training Area 1999 Archeological Test Excavations, McLean Co., ND	32ML58, 32ML186, 32ML203, 32ML234 to 236	8921
2002	Wiltberger, C.		Archaeological Evaluations of 26 Sites Along US Highway 2 in Mountrail and Williams Counties, ND, Vols. 1& 2 & Architectural History Evaluations for Sites 32WD20 & 32WI477 in Ward & Williams Counties, ND, Vol. 3	32MN105, 32MN109 to 111, 32MN113, 32MN116 to 119, 32MN522, 32MN525, 32MN533 to 534, 32MN592, 32MN602, 32MN607, 32MN609, 32MN619, 32MN626, 32WI453	8388
2003	Morrison, J.		Little Beaver Bay Recreation Area: Impact Analysis at 32WI15, Williams Co., ND	32WI15	8418
2003	Ahler, S.		Resurvey and Test Excavations at Beacon Island in Lake Sakakawea, Mountrail Co., ND	32MN234	8697
2005	Jennings, S.	J. Lee	Evaluative Testing of 32WD1548, Ward Co., ND	32WD1548	9166

Year	First Author	Second Author	Title	Sites Tested	MS #
2005	Morrison, J.		Little Knife River Overlook Site: Evaluative Testing of 32MN693 in Mountrail Co., ND	32MN693	9267
2005	Jackson, M.	D. Toom	Site 32MZ1353 Archeological Test Excavations, McKenzie Ranger District, Little Missouri National Grasslands, McKenzie Co., ND	32MZ1353	9467
2006	Harty, J.	P. Heiner	Enbridge Pipelines (North Dakota) LLC, North Dakota Pipeline Expansion Project: A Class II & III Cultural Resource Inventory & Evaluative Testing of Three Sites, Williams Co., ND	32WI83, 32WI971	9856
2006	Harty, J.	J. Morrison	Enbridge Pipelines (ND) LLC, ND Pipeline Expansion Project: Evaluative Testing of 32WI76 & 32WI960 Williams Co., ND	32WI76, 32WI960	9940
2006	Toom, D.	C. Kordecki	Garrison Local Training Area and Williston Local Training Area Archeological Test Excavations McLean & Williams Counties ND	32ML225, 32ML227, 32ML233, 32ML240, 32WI121 to 123, 32WI399	10587
2010	Morrison, J.		2010 McKenzie Rural Water District Phase II Waterline: Class II & III Cultural Resource Inventory & Test Excavations, McKenzie Co., ND	32MZ733	11710
2011	Morrison, J.		McKenzie Rural Water District Evaluative Testing at 32MZ2166 McKenzie County, ND	32MZ2166	12729
2012	Brooks, B.	W. Burns	Evaluative Test Excavation of Site 32MZ2335 McKenzie County, ND	32MZ2335	13685
2012	Stine, E.		Enbridge Sanish Pipeline Project Preliminary Investigations at 32MZ278, 32MZ283, 32MZ667, 32MZ668 McKenzie County, ND	32MZ278, 32MZ667, 32MZ668	13691
2012	Morrison, J.		JMAC Proposed Intake Project: Evaluative Testing 32MZ2415 & 32MZ2416, McKenzie County, ND	32MZ2415, 32MZ2416	13887
2012	Brooks, B.	W. Burns	Evaluative Test Excavation of Site 32WI1281: Williams County, ND	32WI1281, 32MZ2017	13906
2013	Stine, E.		Enbridge's Stanley Station: Evaluation of 32MN460 in Mountrail County, ND	32MN460	14588
2014	Wulffen, J.	J. Harty	Sandpiper Pipeline Project (Enbridge): Evaluative Testing Report for Sites 32WI1434 & 32WI1435 in Williams County, ND	32WI1434, 32WI1435	15192
2015	Harty, J.	D. Salas	Enbridge's Sandpiper Pipeline 2014 North Dakota Archaeological Reconnaissance Studies (Rev 0), & Class III Cultural Resource	32WI434 to 435	15789

Year	First Author	Second Author	Title	Sites Tested	MS #
			Inventory in Williams, Mountrail, Ward, McHenry, Pierce Towner, Ramsey, Nelson, and Grand Forks Counties, ND		
2015	Burns, C.		Evaluative Test Excavation of Site 32MZ2712, McKenzie County, ND	32MZ2712	15912
2015	Robinson, A.		QEP Foreman 13-2X Well Pad, Flowline, and Access Road: Phase 2 Evaluative Testing of Site 32MZ2395 in McKenzie County, ND	32MZ2395	15994
2016	Leroy, Adam	Robinson, A.	QEP's 3-12Y Well Pad and Access: Additional Phase 2 Evaluative Testing and Surface Collection of Archaeological Sites 32MZ3008, 32MZ3009, 32MZ3010, and 32MZ3012 in McKenzie County, North Dakota AND Addendum to QEP's 3-12Y Well Pad and Access: Additional Phase 2 Evaluative Testing and Surface Collection of Archaeological Sites 32MZ3008, 32MZ3009, 32MZ3010, 32MZ3012, and 32MZ3084 in McKenzie County, North Dakota	32MZ3008, 32MZ3009, 32MZ3010, 32MZ3012,	17336, 17337
2016	Green, D.	D. Engel	McKenzie Northern Bypass Roadway Project: Results of Test Excavations at Site 32MZ2716 in McKenzie County, North Dakota	32MZ2716	16584
2019	Robinson, A.	D. Klinner	EN-LABAR-154-94-1003 H-7, 8, 9, 10 Well Pad and Access Road Project: A Class III Cultural Resource Inventory and Evaluative Testing for Site 32MN54 in Mountrail County, North Dakota	32MN54	18544
2020	Kennedy, J.	Norman, B.	Fifth Addendum to Cenex Pipeline, LLC Refined Fuels Pipeline: Evaluative Testing at 32WI2352, Williams County, North Dakota	32WI2352	18706
2020	Stine, E.	Kulevsky, A.	Basin Electric: A Class III Cultural Resource Inventory for the Neset to North Shore 230-kV Transmission Line in Mountrail County, North Dakota	32MN42, 32MN44	18977

Preliminary cultural resource inventories along the Southwest Water Pipeline project were conducted for the State Water Commission and the Bureau of Reclamation. Several sites were recorded along the segment of the pipeline right-of-way falling within the GSU. Testing was carried out at several of these including 32ME788. Artz (1986:63) suggests the site represents low-density cultural deposits associated with ephemeral camps. The most significant site tested along this pipeline route was the Boeckel-Renner site (32ME799) situated high atop the divide between the Missouri and Knife River basins (Artz 1989b).

Two one-meter square test units and 56 shovel probes were excavated at 32MZ721 (Floodman 1986). The site is a large and complex habitation site consisting of at least 57 stone circle features and two cairns.

Several other stone circle sites were tested in the next six years (1986-1992) including 32MZ727 (Floodman 1986), 32WI40 (Persinger and Schweigert 1987), 32MN228 (Winham and Lueck, et al. 1988), 32ME797 (Haury, Picha et al 1988), 32WI309 (Fox 1989), 32DU174 (Sanders and Kempton), 32MN398, 32MN399, 32MN445, 32MN446 (Wermers and Borchert) 32MN448, 32MN449 (Lahren 1991), 32MZ679 (Olson 1992), and 32WI139 (Olson 1992). For additional information on these sites see Table 6.7.

Several cultural material scatter sites were also tested during this time frame. Site 32MZ748 was suggested to have a Middle Plains Archaic or Late Plains Archaic component based the dense patination of the artifacts on both faces of the artifacts (Floodman 1986:31). At 32ME813 a Late Plains Archaic component is present (Borchert 1986). At 32WI50 a datable buried hearth/roasting pit feature was encountered (Gnabasik 1986). At 32MZ936 an Oxbow component was identified (Newberry and Tucker 1989).

Site 32ME254 is situated on grassy uplands in the GSU and the Knife River SU and was tested in 1990. Five clusters of features cover the site. The clusters consist of 77 stone circles, one stone arc, seven cairns, and one petroform (Späth and Christensen 1991). Testing within and outside the features included auger probes and excavation of 10 formal test units. The site contains at least two components, Paleo and Besant, as represented by diagnostic chipped stone tools (ibid.).

Site 32MN395 was tested related to road work. Testing indicated the presence of a single component where meat processing (Bison) and possibly bone grease rendering was conducted. A Middle or Late Woodland temporal affiliation was suggested based on recovery of ceramics (Christensen 1992). Mitigation was carried out in 1993 (refer to the Major Excavation section).

Boughton and Peterson (1994) report on survey and testing in the North Mine Extension Area for The Coteau Properties Company. Sixty-one prehistoric sites were investigated, including: two lithic scatters, 31 stone circle sites, 13 stone circle/cairn sites, 14 cairn sites, and one stone circle/cairn/alignment site (ibid.:Table 2). Testing consisted of 115 shovel probes and 36 test units. Twenty-three test units were within stone circles

and 13 were within cairns. Fifteen sites were recommended eligible for the NRHP. Archaeologists suggest that many of the sites recommended as not eligible might be viewed together as contributing elements to a larger district (ibid.).

The North Dakota Department of Transportation archaeologists tested a small rock cairn with two square meters of excavation. No artifacts were recovered from the cairn at 32MN508, and the site was recommended as not eligible for listing in the National Register of Historic Places (Christensen 1996). That same year 32WI346 was tested with 169 shovel probes and 10 1-x-1 m units. The site consisted of 14 stone circles and two rock cairns. Two point fragments were recovered indicating a possible Early Archaic component (Simonsen). Flakes, bone fragments, an end scraper, and FCR were also recovered. The site was recommended as not eligible for listing to the National Register (Christensen 1996).

Eleven stone circle sites were tested in McLean County that fall within the GSU. Of these site 32ML231 had a hearth with datable fill that was recovered from a stone circle. Fill from the hearth yielded a bulk soil radiocarbon date of 1770±60. Site 32ML233 was also a stone feature site and considered eligible for listing in the National Register (Stine and Kulevsky 1994).

Testing at 32DU80 revealed at least two components: Plains Archaic and Woodland or possibly Plains Village (Kulevsky and Stine 1995).

The survey at 32ME588 identified two probably Archaic projectile points. Later when the site was tested in 1995 much of the site had eroded (Larson et al. 1995). Archaeologist did identify an area with a reasonably intact cultural level with associated subsurface features. It appeared that the area contained meat processing and well as a marrow and/or bone grease extraction activity area (ibid. 16).

Several stone circle sites were tested in the North Mine Extension Area (Peterson 1996). Additional stone circle sites (4) were tested at the National Guard Recreation Area (Molyneaux et al. 1996).

Two (32DU1155 and 32DU1154) of the five tested sites at Skunk Creek Bay had Oxbow components (Späth 1996).

Eleven archaeological sites along a proposed pipeline corridor were tested for NRHP eligibility in 1998 (Olson and Newberry 1999). Project archaeologists evaluated site eligibility based on (1) the presence of cultural deposits, (2) retention of site integrity, and (3) significant amounts of cultural material at a site (ibid.:1). Four of the sites are within the GSU. Site 32ME1444, a stone circle and cairn site, is located on an upland overlooking a drainage with natural springs to the west. Investigators suggest 32ME1444 is related to a turtle effigy site (32ME1270) 200 m southwest (ibid.:3). In addition to stone features, a lithic scatter covering approximately 1,000 m² is present (ibid.:9). The site has been recommended eligible for the NRHP based on its potential to expand archaeological knowledge of KRF reduction activities in and out of stone circles. Site

32WI132 also was tested. It is on an upland which slopes east to a south-southeast trending drainage north of the Missouri River trench. Site testing and evaluation confirmed the presence of eight stone circles and an abundance of lithic materials. The lithic assemblage included scrapers, retouched shatter, a preform, and debitage. Most of the artifacts were grey porcellanite but red porcellanite, KRF, and Swan River chert also were present (ibid.:43). Two hearths were recorded at the site. Feature 4a contained debitage, calcined bone, a biface fragment, and charcoal. A charcoal sample was radiocarbon dated to the Middle Plains Woodland (ibid.:45). The site was recommended eligible for listing in the NRHP. The other two sites (32MZ791 and 32WI354) tested within the GSU were recommended not eligible for the NRHP due to the paucity of cultural material.

Testing was undertaken at It's a Beautiful Day site (32MN514) in 1998. The site, located on a ridge overlooking the White Earth River, consists of 27 stone circles and two cairns (Morrison 1999a). Seventy-two shovel test probes and five test units were excavated. A total of 141 artifacts were recovered, 60% from Rock Cairn 1. Lithic raw material types included quartzite, TRSS, chert, chalcedony, KRF, granite, and porcellanite (ibid.:15). A biface, scrapers, cores, and tested raw material, bone fragments, and a hearth with fire-cracked rock and burnt earth were recorded. A Prairie side-notched projectile point was found in the waterscreen sample of Rock Cairn 1. Based on artifactual evidence, the site has been dated to 1380-600 BP (ibid.:16).

In 2000 the low water level at Lake Sakakawea exposed a portion of Beacon Island. Agate Basin points were reported from the lakeshore. In 2002 a Historic Preservation Matching Grant was initiated with Paleocultural Research Group to conduct test excavations at the site (Ahler 2003). This program clearly identified intact significant deposits and resulted in more extensive excavations in 2006 (Mitchell 2012) aided by a Save America's Treasure Grant. The site is discussed in more detail in the section on major excavation and in the Paleoindian section for the GSU.

In 2000 a large test excavation project was undertaken to examine 179 previously unevaluated sites within three mining expansion areas in central Mercer County (Boughton et al. 2001). Testing involved the excavation of 403m² from test units, shovel tests, shove probes, and soil cores (ibid.). Thirty-five prehistoric sites were recommended eligible for listing in the NRHP. Further, archaeologists suggest 13 sites have the potential to expound on research questions presented in the State Plan, particularly those concerning stone circles and prehistoric hunting strategies.

The mine expansion areas are in the GSU and the Knife River SU. Within the GSU, the sites include 10 stone circle sites, four cairn sites, three stone circle/cairn sites, one stone circle/cairn/alignment site, and three lithic scatters (ibid.). Of the 21 sites in the GSU, two were recommended eligible for listing on the NRHP. Site 32ME1463, a lithic scatter, is located north of Lake Sakakawea and east of a major drainage. Archaeologists noted that the lithic assemblage reveals the site's potential to contain diagnostic artifacts and/or datable deposits (ibid.:10.176). Site 32ME1528, a stone circle site, is located on a ridge above Beaver Creek Bay. A variety of artifacts were recovered, including: the basal

portion of a KRF Plains side-notched projectile point, a KRF preform, bone fragments, and debitage (ibid.:10.262). The site was recommended as eligible for listing in the NRHP because of cultural/temporal context and the possibility for further research.

Sites 32MZ1474 and 32MZ1475 were tested by the US Forest Service (Floodman 2001). Site 32MZ1474 consists of five stone circles located northwest of a meander in Clear Creek. Site 32MZ1475, a cultural material scatter, is across the creek to the southeast of 32MZ1474. Animal bones comprise most cultural materials from the sites, however lithic artifacts and hearth features also were recorded. Interiors of stone circles at 32MZ1474 contained a fair amount of bone, leading Floodman (ibid.) to suggest bison bone processing activities occurred within the stone circles. Three side-notched arrow points, the total of the diagnostic artifacts, were recovered from Stone Circle #2 at 32MZ1474 (ibid.:20). The points' style indicates an occupation dating to the Old Women's complex of the Late Plains Woodland or the late Plains Village. Stone Circle #5 contained one modified bone digging tool (ibid.:26) and a hearth radiocarbon dated to AD 1720-1950 (ibid.:70). The cultural zone at 32MZ1474 extends to a depth of approximately 10 cm, indicating the presence of one component. Across the creek, 32MZ1475 contains a hearth eroding out of a cutbank. Tests on a charcoal sample from the hearth resulted in a date that corresponds to the Old Women's complex, late Plains Village, or the Equestrian Nomadic (ibid.:59). The amount of fractured bison bone suggests this may have been a location of bison bone processing and grease manufacture (ibid.:38). In general, the faunal analysis suggests that the site was occupied from late autumn through early spring. This assumption is based on the large amount of fetal bone fragments and the large size of the hearth (ibid.:38). Seasonality of both sites is further supported by the arrangement of the stone circles with an apparent concern for wind patterns, and evidence of activities within the stone circles (ibid.:72). A single cultural component is present at each site. Floodman (ibid.) notes that it is not common to test single component sites within the Little Missouri National Grasslands. The two sites may be related remnants of one occupation (ibid.:72).

Six sites (32ML58, 32ML186, 32ML203, 32ML234, 32ML235, and 32ML236) were tested at the Garrison Local Training Area in 1999 utilizing multiple 1-x-1-m test units. All six were artifact scatters thought to represent short-term, low intensity lithic procurement and workshop locations and possibly game lookout locations. Only site 32ML203 could be identified as having a Late Prehistoric component based on recovery of a sherd. The sites were recommended as not eligible for listing in the National Register of Historic Places (Bales, Jackson, et al. 2001).

Twenty-one archaeological sites were evaluated along US Highway 2 in Mountrail and Williams counties for the North Dakota Department of Transportation in 2002. Six sites, all in Mountrail County, retain good integrity and have been recommended as eligible for listing in the NRHP. All six sites are located within the White Earth River valley, south of US Highway 2 (Wiltberger 2002). Five sites (32MN110, 32MN116, 32MN119, 32MN522, 32MN533) contain stone features with associated artifacts. Commonalities of the stone feature sites include small size and artifact assemblages comprising lithics, floral material, and fauna specimens. Hearths

were uncovered at sites 32MN110 and 32MN119 dating to the Plains Equestrian Nomadic period and the Late Plains Archaic/Early Plains Woodland transition, respectively (ibid.:6-8,6-12). Additionally, a Plains Woodland projectile point base was recovered from 32MN522 (ibid.:6-13). Site 32MN525, located in the floodplain of the White Earth River, has two components. The surface component consists of a lithic scatter, age unknown. The second component is in buried alluvium atop a paleosol. Further, the top of a cairn was uncovered approximately 15 cm below surface (ibid.:6-13). Charcoal sampled from the base of the cairn dates to the Plains Woodland period (ibid.:6-14). Investigators propose these six sites could answer questions concerning prehistoric/protohistoric subsistence patterns and lithic technology.

Impact analysis was required after boat ramp construction disturbed a previously recorded site (32WI15). The site has multiple components including Paleoindian, Early Plains Archaic, and an upper component identified by the presence of a hearth with lithics and bone. Near the boat ramp three 1-x-1 meters test units investigated the east side and recovered 151 artifacts including flakes, bone fragments, core, flake tool, and FCR. The west side was investigated with two 1-x-1 meter test units. The impact analysis recommended that this part of the site was non-contributing and that the site remains unevaluated (Morrison 2003).

Site 32MN693 is a stone feature site with circles and cairns on a ridge overlooking the Little Knife River. Test excavation in 2003 recovered lithic artifacts and bone fragments. One of the cairns had human remains and based on that, excavation ceased and NDDOT elected not to use the area for a materials location for a road project.

Twelve 1-x-1-m test units and 64 auger probes were utilized to investigate 32MZ1353. A Middle Plains Woodland component was indicated based on the presence of a Besant projectile point and a Plains Village component based on three Plains Side-Notched points. Other recovered artifacts include a stone tool and flaking debris. The site was proposed as a game lookout location. The site was recommended as not eligible for listing in the National Register of Historic Places (Jackson et al. 2005).

Eight sites in the GSU and a Local Training Area for the North Dakota Army National Guard were tested in 2004 and 2005 (Toom and Kordecki 2006). Seven of the sites were stone circle site and one rock alignment. Sites 32ML240, 32WI121, 32WI122, and 32WI123 were reported as having probable Plains Village components. Sites 32ML225, 32ML227, and 32ML233 probably date to the late prehistoric period (ca AD 600-1800). The rock alignment (32WI123) may have functioned as a hunting driveline feature drive.

Evaluative test excavations were conducted in 2011 at 32MZ2166, a cultural material scatter. Recovered artifacts include 385 lithics (seven different types of raw material, six stone tools), one pot sherd, and 906 fragments of faunal bone. During monitoring two hearth features were excavated (Morrison 2011).

In 2012 three sites (32MZ278, 32MZ667, and 32MZ668) were tested related to Enbridge Pipelines (Stine 2012). At 32MZ668 Middle Archaic and a Besant point were recovered. A hearth was identified at 32MZ667.

Sites 32MZ2415 and 32MZ2416 were tested in 2012 related to the JMAC waterline (Morrison 2012). Debitage, cores, bone fragments, and FCR were recovered at 32MZ2415. The site was recommended as eligible for listing in the National Register of Historic Places. Site 32MZ2416 was recommended as not eligible due to the paucity of artifacts and previous impacts.

Four sites were evaluated for QEP'S 3-12Y well pad and access road (Leroy et al. 2016; Leroy 2016). All were cultural material scatters and only 32MZ3009 was recommended as eligible for listing in the National Register of Historic Places. Site 32MZ3009 was tested with three excavation units as well as shovel probes. Two hundred fifty-five artifacts were recovered including a fragment of a Pelican Lake point, two obsidian flakes, a grinding stone, scraper, biface, uniface, and flaking debris.

Site 32MZ2716 was tested related to a road project (Green et al. 2016). The site is a dense concentration of cultural material in association with a feature (hearth). Stone tools and flaking debris were recovered including eight obsidian flakes. A short-term camp was tested where retooling and procuring specific resources was suggested. The site was recommended as eligible for listing in the National Register of Historic Places.

Site 32MN54 is a cultural material scatter and a single cairn (Robinson and Klinner 2019). One 1-x-1-m test unit and 44 shovel probes were used to evaluate the site. No excavations occurred in the cairn. Two flakes were recovered, and the site was recommended as not eligible to the National Register. Much of the site had previously been disturbed by the well pad.

Site 32WI2352 is a stone feature site consisting of 14 cairns, 8 circles, and 9 other rock features identified in an unanticipated discovery situation (Kennedy et al. 2020). Five excavations units (1-x-1-m), 1 50-x-50-cm unit, and 31 shovel probes were used in evaluating the site. Only a few flakes and bone fragments were recovered, and the site was recommended as not eligible for listing in the National Register of Historic Places.

Two sites underwent testing in the exact locations of power line pole placement at sites 32MN42 and 32MN44 (Stine et al. 2020). Few artifacts were recovered in the excavation units and although the sites remain unevaluated the project proceeded around the excavation units.

Stone Circle and Cairn Sites

Over 3,000 stone circle sites have been identified during surveys (see Table 6.2) in this SU. Table 6.7 lists the stone ring sites that have been tested or excavated. For sites to be listed in this table there had to be **formal testing (at least one 1-x-1-m unit)** at the site. During mitigation entire stone circles were excavated at several sites enabling

research on spatial use in domestic structures. These excavations 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 stone circles. Table 6.7 was developed so these data are readily available for researchers.

The monograph on stone circle 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 stone circle 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 features sites can be found in the reference section of the Cultural Heritage Form.

Cairns are a common site type (n=1,995) in the GSU (Table 6.2). Suggested uses of cairns include markers for events and travel routes, bracing poles for a variety of camp structures, caches, drive lines, or covering a burial. Hecker (1937-1950:161) reports that piles of stones were also placed over buffalo chip fireplaces to heat the stones for drying meat on.

National Register of Historic Places

Writing Rock (32DV4) is listed in the National Register of Historic Places (NRHP). This site was described by Will and Hecker (1944). It includes two large granite boulders covered with pecked glyphs plus three or more associated stone circle features. Joyes (1978) describes the thunderbird motif glyph on the rock. Also, the Evans site (cf. Schneider and Kinney 1978) is listed in the NRHP. The Beacon Island Agate Basin site (32MN234) and Midipadi Butte (32DU2) have had formal determinations of eligibility for the NRHP by the Keeper of the Register.

Sites in North Dakota listed in the NRHP are available on the National Park Service website.

Table 6.7: Formally Tested Stone Features in the Garrison Study Unit, 31 December 2020.

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	MS #
32DU396	Cairn	Inside	Yes	Obsidian geochemical analysis Basin hearth Radiocarbon dating Pollen analysis	Early Plains Archaic	7179
32DU396	Cairn	Outside	Yes			9508
32DU625	Cairn	Inside	Yes			5059
32DU714	Circle	Inside	No			4924
32DU1154	Cairn	Inside, outside	Yes			9508
32ME95	Circle	Inside	Yes			8531
32ME96	Circle	Inside	No			
	Cairn	Inside	Yes			
32ME97	Circle	Inside	Yes			
32ME98	Circle	Inside	Yes			
32ME100	Circle	Inside	Yes			
32ME111	Circle	Inside, outside	Yes			
32ME258	Circle	Inside, outside	Yes		Samantha/Prairie side-notched	9598
	Cairn	Inside	Yes			
32ME263	Circles	Inside, outside	Yes			
32ME264	Circle	Inside, outside	Yes		Samantha	
32ME266	Circles	Inside, outside	Yes	Obsidian (Obsidian Cliffs, Wyoming)		
32ME342	Circle	Inside	Yes			8531
32ME343	Circle	Inside	No			
32ME503	Circles	Inside, outside	yes			3171
32ME506	Circles	Inside, outside	yes			
32ME544	Cairns	Inside	Yes			7418
32ME717	Circles	Inside, outside	Yes	Hearth Radiocarbon dating Macrofloral analysis	Plains Village	9598

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	MS #
32ME797	Circle	Inside, outside	Yes			4711
32ME797	Circle	Inside, outside	Yes		Pelican Lake	5463
32ME797	Circle	Inside, outside	Yes			7304
32ME812	Circles	Inside, outside	Yes			3871
32ME812	Circles	Inside, outside	Yes			4099
32ME1261	Circles	Inside, outside	Yes	Protein residue analysis	Besant McKean Complex Plains Village	9598
	Cairns	Inside	Yes	Hearth Radiocarbon analysis Ceramics		
32ME1348	Circle	Inside	Yes			6652
32ME1349	Cairn	Inside	No			6347
32ME1350	Circle	Inside	Yes			
32ME1352	Circle	Inside	Yes			
32ME1357	Circles	Inside	Yes	Blood residue analysis Hearth Radiocarbon dating	Besant	6689
32ME1358	Circle	Inside	Yes			6347
32ME1358	Circles	Inside	Yes			6689
32ME1360	Circle	Inside	Yes			6347
32ME1364	Cairn	Inside	Yes	Blood residue analysis	Late Prehistoric	6689
32ME1372	Circle	Inside	No			6652
32ME1374	Circle	Inside	Yes			6689
	Cairn	Inside	Yes		Avonlea	
32ME1376	Circle with Cairn	Inside	Yes			
32ME1380	Circle	Inside	Yes	Hearth Radiocarbon dating Blood residue analysis	Late Prehistoric	
32ME1382	Circle	Inside	Yes			6652
32ME1384	Circle	Inside	Yes	Blood residue analysis		6689
32ME1387	Circles	Inside	Yes	Blood residue analysis		
32ME1392	Circles	Inside	Yes	Hearth	Besant	

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	MS #
				Radiocarbon dating Pollen analysis	Late Prehistoric	
32ME1394	Circle	Inside	Yes			6652
32ME1395	Circle	Inside	Yes	Blood residue analysis Radiocarbon dating		6689
32ME1398	Circle	Inside	Yes			6652
32ME1402	Circles	Inside	Yes	Blood residue analysis Hearth Pollen analysis	Besant	6689
32ME1403	Circles	Inside	Yes	Ceramics	Plains Village	
32ME1417	Circle	Inside	No			6652
32ME1444	Circles	Inside, outside	Yes			7299
32ME1444	Circles	Inside, outside	Yes	Hearth	Prairie side-notched	8030
32ME1456	Circle	Inside, outside	Yes	Protein residue analysis	Duncan Besant	7304
32ME1462	Circle	Inside	No			8531
32ME1528	Circle	Inside	Yes			
32ME2207	Cairn	Inside	Yes			9598
32ML117	Circles	Inside	yes	Possible hearth		2514
32ML224	Circles	Inside, outside	no			2478
32ML226	Circles	Inside, outside	Yes			6395
	Cairn	Inside	No			
32ML228	Circles	Inside, outside	Yes			
	Cairn	Inside	Yes			
32ML229	Circle	Inside, outside	Yes			6831
32ML231	Circle	Inside	Yes			6395
32ML232	Circle	Inside	Yes	Hearth Radiocarbon dating	Late Prehistoric	
32ML233	Circles	Inside, outside	Yes			
	Cairn	Inside	Yes			
32ML237	Circle	Inside, outside	Yes			6831
32ML239	Circles	Inside, outside	Yes			
32ML243	Circle	Inside, outside	Yes			
32ML858	Circle	Inside, outside	Yes			6395

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	MS #
	Cairn	Inside	Yes			
32ML860	Circle	Inside	Yes			
32ML861	Circles	Inside, outside	Yes			
32ML862	Circles	Inside, outside	Yes			
32ML863	Circle	Inside	Yes			
32MN105	Circle	Inside	Yes			8388
32MN109	Circles	Inside	Yes			
32MN110	Circle	Inside	Yes	Radiocarbon dating	Equestrian Nomadic	
32MN111	Cairn	Inside	No			
32MN113	Circles	Inside	No			
32MN116	Circle	Inside	Yes			
32MN117	Circles	Inside	Yes			
32MN118	Circles	Outside	Yes			
32MN119	Circle	Inside	Yes	Radiocarbon dating Hearth	Late Plains Archaic or Early Plains Woodland	
32MN143	Circles	Inside	Yes	Ceramic	Late Plains Woodland	3316
32MN147	Circles	Inside	Yes			
32MN150	Circle	Inside	Yes	Hearth		
32MN228	Circle	Inside	Yes			4608
32MN398	Circle	Inside	Yes			4800
32MN399	Cairn	Inside	No			
32MN445	Circles	Inside, outside	No			
32MN446	Circles	Inside	No			
32MN448	Cairn	Inside	No			5563
32MN449	Cairn	Inside	No			
32MN460	Circles	Inside	No			14588
32MN508	Cairn	Inside	No			6753
32MN509	Cairn	Inside, outside	Yes			6407
32MN512	Cairn	Inside, outside	Yes			6795
32MN522	Cairn	Inside	Yes			8388
32MN525	Cairn	Inside	Yes	Radiocarbon dating	Plains Woodland	
32MN533	Circle	Inside	Yes			
32MN534	Cairn	Inside	No			
32MN592	Circle	Inside	Yes			

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	MS #
32MN602	Circle	Inside	No			
32MN607	Cairn	Inside	No			
32MN609	Circle	Inside	Yes			
32MN619	Circles	Inside	Yes			
32MN626	Circle	Inside	Yes			
32MN693	Circles	Inside, outside	Yes			9267
	Cairns	Inside	Yes	Burial		
32MZ233	Circles	Inside, outside	Yes	Radiocarbon dating	Besant	3673
32MZ278	Circles	Inside, outside	Yes			12996
32MZ679	Circles	Outside	Yes	Hearth		5746
32MZ679	Circles	Outside	Yes			6613
32MZ721	Circles	Inside	Yes		Duncan Plains side-notched	1849
32MZ721	Circles	Outside	Yes			3925
32MZ727	Circles	Inside, outside	Yes	Hearth		3927
32MZ733	Circle	Inside	Yes			11710
32MZ1444	Circle	Inside	No			7559
32MZ1474	Circles	Inside	Yes	Radiocarbon dating Hearths	Old Woman's complex Late Prehistoric	8117
32MZ2335	Circles	Inside	Yes			13685
32MZ2712	Circle	Inside, outside	No			15912
32WD117	Circles	Inside, outside	Yes			681
32WD119	Circles	Inside, outside	Yes			
32WI27	Circles	Inside	yes			3456
32WI28	Circles	Inside, outside	yes			
	Cairns	Inside	yes			
32WI49	Circles	Inside, outside	yes		Late Prehistoric	
	Cairns	Inside	no			
32WI121	Circles	Inside, outside	Yes	Ceramic	Late Prehistoric	10587
32WI122	Circles	Inside, outside	Yes	Ceramics	Late Prehistoric	
32WI123	Alignment	Outside	Yes	Ceramic	Late Prehistoric	
32WI132	Circle	Inside, outside	Yes	Radiocarbon dating Hearths	Middle Plains Woodland	7299
32WI309	Circles	Inside	No			4709

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	MS #
32WI346	Circles	Inside	Yes		Early Archaic (Simonson)	6792
	Cairns	Inside	No			
32WI349	Circles	Inside, outside	Yes	Obsidian Geoarchaeology	Besant/Avonlea	7596
32WI354	Circles	Inside	Yes			7299
32WI399	Circles	Inside	Yes		Late Prehistoric	10587
32WI453	Circles	Inside	No			8388
32WI971	Circle	Inside	No			9856
32WI1281	Circle	Inside	No			13906
32WI1434	Circle	Inside, outside	No			15192
32WI1435	Circle	Inside	No			
32WI2352	Circles Cairns Other	Inside, outside (circles)	Yes			18706

Major Excavation Projects

Major excavation work can be divided into two periods of investigation: (1) SIRBS (and cooperating institutions), and (2) post-SIRBS. Prior to damming of the Missouri River, it was known that the construction of Garrison Project was going to affect several prominent earthlodge villages and other historic properties. Major salvage excavations were undertaken at a number of these sites by the SIRBS. Included were Star Village (Metcalf 1963), Rock Village (Hartle 1960; Lehmer et al. 1978), Night Walker's Butte (Lehmer et al. 1978), Grandmother's Lodge (Woolworth 1956), and Like-A-Fishhook Village (Smith 1972). Except for Grandmother's Lodge, a prehistoric Plains Village site, all the others are post-contact earthlodge villages. Salvage excavations were carried out at two historic sites: Kipp's post, a fur trade post (Woolworth and Wood 1960, 1962), and Fort Stevenson, a military post (Smith 1960a).

The Moe site was recorded during SIRBS (Kivett 1948). The site was excavated in 1973 and 1974 by the University of North Dakota after Mavis Moe brought attention to the site and the collection of Clovis (2) and Folsom (5) projectile points along the beach (Schneider 1975). Six 2-x-2-m units and 1 7-x-8-m units were initially excavated followed by a series of other excavations when hearth features were exposed in the eroding bank. Although no Clovis or Folsom components appeared to remain at the site multiple components were present (Oxbow, Duncan, Hanna, McKean, and Besant projectile points). Historic components were also present based on the recovery of 2 glass beads and metal artifacts. Radiocarbon dates from hearth features were 4320 BC and 4045 BC.

Multiple excavations have occurred at the Midipadi Butte site. The site was reported in the early-to-mid-1900s (Will 1924; Will and Hecker 1944) and during SIRBS (Metcalf 1963). A series of trench excavations were placed in five surface depressions in 1977 (Good and Hauff 1977). Although a Besant complex component is present, it is primarily recognized as a Hidatsa site dating to AD 1781-1815. Hidatsa oral tradition reveals much about the history at that time (Lippincott 2007; Lehmer, Wood, Dill 1978).

In 1979, 32ME117, a stone circle site was excavated (Good and Dahlberg 1979). The following year, major excavations were carried out at the multiple component Mondrian Tree site (Toom and Gregg 1983). Some 250 m^3 of site matrix was processed by controlled hand excavation.

Since 1991, reports of major excavation projects within the GSU have occurred at a relatively consistent rate (see Table 6.8).

Table 6.8: Major Excavation Projects in the Garrison Study Unit, 31 December 2020.

Year	First Author	Second Author	Title	Sites Excavated	MS #
n.d.	Kleinsasser, G.		Report on the Excavations at the Fort Berthold Indian Village Site, McLean Co., ND	32ML2	21
1950	Woolworth, A.		Grandmother's Lodge (32ME59) Field Notes	32ME59	28
1951	Hartle, D.		Excavation Field Notes, Rock Village Site (32ME15)	32ME15	34
1951	Hartle, D.		Field Notes from Survey Files: Star Village (32ME16)	32ME16	37
1951	Malouf, C.		Archaeological Studies of Aboriginal Occupation Sites in Northwestern ND, Mercer Co., ND	32ME15, 32ME43, 32ME54 to 55	3745
1952	Hartle, D.		Excavation Field Notes, Rock Village Site (32ME15)	32ME15	35
1953	Howard, J.		The Like-A-Fishhook Village Site, Old Fort Berthold, McLean Co., ND	32ML2	19
1953	Hartle, D.		The Rock Village Site, Mercer Co., ND	32ME15	33
1954	Smith, G.	A. Woolworth	Excavation of the Site of Fort Berthold I (32ML2), Interim Report	32ML2	20
1955	Woolworth, A.		The Archeology of Grandmother's Lodge, Site 32ME59	32ME59	29
1956	Woolworth, A.		The Archeology of Fort Berthold I & Explorations at Like-A-Fishhook Village (32ML2) in 1954	32ML2	22
1960	Hartle, D.		Rock Village: An Ethnohistorical Approach to Hidatsa Archaeology, Mercer Co., ND	32ME15	36
1975	Schneider, F.		The Results of Archaeological Investigations at the Moe Site 32MN101, ND	32MN101	46
1979	O'Brien, L.		Archaeological Test Excavations at 32WD117 & 32WD119, Ward Co., ND: A Cultural Resource Study in the Path of Proposed US Highway 83	32WD117, 32WD119	681
1980	Robson, L.		Beulah Bay Burial Shoreline Recovery, July 1980, Mercer Co., ND	32ME463	3824
1981	Toom, D.		Archeological Investigations at the Mondrian Tree Site (32MZ58), McKenzie Co., ND: Annual Progress Report, 1980	32MZ58	2565
1982	Kuehn, D.	C. Falk et al.	Archeological Data Recovery at Midipadi Butte, 32DU2, Dunn Co., ND	32DU2	2757

Year	First Author	Second Author	Title	Sites Excavated	MS #
1983	Toom, D.	M. Gregg	Archeology of the Northern Border Pipeline, ND: Vol. 1, Pts. 1-3 Archeology of the Mondrian Tree Site 32MZ58	32MZ58	3454
1991	Deaver, K.		Excavations at the Twin Buttes Site 32DU32/32ME617 in West Central ND, Vol. 1 & 2	32DU32, 32ME617	5565
1992	Tucker, G.	B. Olson	The Figure Four Road Project: Data Recovery at Two Archaeological Sites on the Fort Berthold Indian Reservation, McKenzie & Dunn Counties, ND	32MZ936	5931
1994	Larson, T.	D. Penny	Results of the 1993 Archaeological Investigations at 32MN395, Mountrail Co., ND	32MN395	6207
1996	Boughton, J.	K. Vander-Steen et al.	Data Recovery of 13 Sites Located in the North Mine Extension Area, Mercer Co., ND	32ME1357 to 1358, 32ME1364, 32ME1374, 32ME1376, 32ME1380, 32ME1384, 32ME1387, 32ME1392, 32ME1395, 32ME1402 to 1403	6689
1997	Floodman, M.	M. Bergstrom et al.	1995-96 Passport in Time: Archeological Investigations at the Boots Site, 32MZ732 McKenzie County, North Dakota	32MZ732	7109
1998	Graham, C.	L. Cummings et al.	Prehistoric Occupation of the Missouri River Uplands: Excavations at 32DU396 & 32DU1154 Dunn Co., ND	32DU396, 32DU1154	7179
1998	Winzer, S.	J. Boughton	Data Recovery at 32ME254 Mercer County, North Dakota	32ME254	7180
1999	Walker-Kuntz, S.	J. Boughton	Data Recovery at 32ME797 & 32ME1456 Mercer Co, ND	32ME797, 32ME1456	7304
2000	Morrison, J.		Road to Greasy Grass: Data Recovery Excavations at 32WI349, Williams Co., ND	32WI349	7596
2001	Olson, B.		The Lorenz and Buffalo Hill Sites: Mitigation of Two Stone Circle Sites Along the Dakota Gasification CO_2 Pipeline, Dunn & Mercer Counties, ND	32ME1444	8030

Year	First Author	Second Author	Title	Sites Excavated	MS #
2006	Bales, J.	J. Boughton et al.	Coteau Properties: Data Recovery at Nine Sites in Mine Area 2 North, Mercer Co., ND	32ME258, 32ME263 to 264, 32ME266, 32ME717, 32ME1261, 32ME2200, 32ME2207, 32ME2214	9598
2006	Lee, J.		Data Recovery Results of 32MN525, Mountrail Co., ND	32MN525	9691
2012	Mitchell, M.		Agate Basin Archaeology at Beacon Island, North Dakota	32MN234	13538

Downriver from the Mondrian Tree site (32MZ58) is 32MN395. Excavation at the latter revealed at least 12 cultural levels dating from the Early Plains Archaic through the Late Woodland period (Larson and Penny 1994, 1995). Investigators note, "The upper third of these deposits may be one of the best preserved examples of stratified Woodland occupation in the Garrison Study Unit…the presence of multiple Woodland components at the same site offers a unique opportunity to trace the development of the Plain [*sic*] Woodland through time and possibly link these changes to fluctuations in the natural environment, technological changes, the presence of new cultural groups in the area, and pressures brought on by increases in population" (Larson and Penny 1994:111). Dates and paleoenvironmental data for the site result from the recovery of diagnostic materials, radiocarbon samples, geological studies, pollen analysis, phytolith analysis, and floral and faunal analyses (Larson and Penny 1994, 1995).

Data recovery was carried out at 32MZ936 on the Fort Berthold Reservation (Tucker and Olson 1992). Mitigation consisted of 53 shovel probes and 61 square meters of excavation. The site had multiple components from Early Plains Archaic to Plains Village/Equestrian Nomadic. The most intensive components were from the Middle Plains Archaic through the Middle Plains Woodland. The site is proposed to be a camp where local plants and animals were processed and consumed.

Results of investigation at the Twin Buttes site (32DU32/32ME617) reveal the site was occupied at least twice. Absolute and relative techniques date the site to the Besant Phase (radiocarbon dates) and the Protohistoric period (a metal projectile point) (Deaver 1991). Based on the high density of unifaces, investigators suggest that primary site activities were bison processing and hide preparation (ibid.:i). Projectile point styles include nine Pelican Lake points, 56 Besant points, and one Samantha point (ibid.:110). Awls, gravers, bifaces, bone tools, and Besant-type ceramics account for other artifact classes (ibid.). Features encountered during excavation include 14 hearths, 11 stone boiling pits, seven toss-out scatters containing fire-cracked rock, 15 bone uprights, four cairns, two buried stone circles, and two or three exposed stone circles (ibid.:121-125). Investigators conclude that the site may have been a base camp related to smaller, outlying campsites in the area.

During the field seasons of 1995 and 1996, excavations were conducted in the Little Missouri National Grasslands as part of the US Forest Service's *Passport in Time* volunteer program (Floodman et al. 1997). The excavations occurred at the Boots site (32MZ732) located in the Missouri River breaks. Site occupation extends from the Early Plains Archaic through AD 1943. The various archaeological materials recovered include a copper awl, Besant/Sonata complex and Plains Village ceramics, 30 projectile points, bifaces, scrapers, retouched flake tools, utilized flakes, cores, hammerstones, a mano, debitage, and faunal remains. The copper awl, the sole copper artifact documented and dated within the Little Missouri National Grasslands, dates to 770-375 BC (ibid.:119). Moreover, investigators note that "The dated copper awl from the Boots site is a rare occurrence for the region and a valuable contribution to the knowledge of the use and distribution of this rare resource type in western North Dakota" (ibid.). Diagnostic projectile points include a Duncan point base, an Archaic stemmed dart point, a Pelican

Lake point, and a Besant dart point (ibid.:78). The site has been evaluated as eligible for listing in the NRHP under Criterion D.

Mitigation was conducted at two sites along an access road to Lake Sakakawea (Graham et al. 1998). Sites 32DU396 and 32DU1154 were located on ridgetops overlooking the lake to the north. Both sites are thought to have been seasonal hunter-gatherer camps indicated by bison bone and macrofloral remains. The lithic assemblages suggest that tool production and maintenance also were important activities. A radiocarbon date of 6100±70 RYBP (Early Plains Archaic) was obtained for 32DU396 (ibid.:131). Additionally, projectile points recovered at that site are Late Archaic forms. Though 32DU1154 was deflated, cultural materials indicate that the site had a longer occupational history than 32DU396. Chipped stone tools recovered at the site included a Goshen spearpoint fragment, two Folsom point fragments, and an Avonlea point fragment (ibid.:132).

Since the early 1990s, a series of major excavation projects have been undertaken by Ethnoscience, Inc. to mitigate the effects of expanding coal strip mining operations by Coteau Properties Company in central Mercer County. The sites are within the Beulah Trench which is characterized by rolling grasslands with intermittent ridges and drainages. Stone feature and lithic scatters are common site types in the area. Primary research questions posed by investigators have focused on chronology, settlement and site function, diet and subsistence, lithic technology, and paleoenvironmental conditions (Boughton et al. 1994; Winzler et al. 1998). A summary of the projects follows.

Mitigative measures were undertaken in 1993 in the North Mine Extension Area. Within the GSU, 12 archaeological sites were destroyed. The sites were located at the convergence of several ecozones. Eighteen stone circles, one stone circle with an associated cairn, and two cairns were investigated (Boughton et al. 1996:7.1). Materials recovered included over 10,000 pieces of debitage, projectile points, patterned and unpatterned tools, cores, bone fragments, ceramics, hearths, an ash lens, a charcoal concentration, fire-cracked rock, and a possible cache pit (ibid.). Traditional excavation techniques and laboratory procedures were supplemented by analyses of ^{14}C samples, pollen, flotation, obsidian, and blood residue (ibid.). Though sampling bias is a possibility, investigators drew several conclusions regarding the research topics. First, five cultural components have been identified across the North Mine Extension Area, including the “Archaic Besant” (AD 330-890), the Besant complex, the Avonlea complex, the Late Prehistoric (AD 960-1390), and the Late Prehistoric/Plains Village (ibid.:7.2). Second, stone circle size and placement suggest length of stay and seasonality of occupations (ibid.:7.3). Third, subsistence strategies consisted of the exploitation of bison, smaller mammals, birds, and berries (ibid.:7.4).

More mine expansion led to mitigation of 32ME254 in 1997. The 130-acre multi-component site consisted of 81 stone circles and seven cairns located in glaciated upland plains (Winzler et al. 1998:5.1). Eight stone circles, three cairns, and one possible petroform were excavated. Investigators identified five components at the site: Oxbow, McKean, Pelican Lake, Besant, and Plains Village or Late Prehistoric. Chronological

indicators included two radiocarbon samples, two oxidizable carbon ratio (OCR) samples, and diagnostic artifacts. The radiocarbon dates are AD 695-995 for Feature 58A and AD 130-395 for Feature 87A (ibid.:6.1). The OCR results are AD 1529 (without deflation) and AD 525 (with deflation) for Feature 58A and AD 1726 (without deflation) and AD 1339 (with deflation) for Feature 87A (ibid.). The investigators note that the results of the two techniques do not correlate and conclude that "the assignment of dates based solely on the OCR method may prove unreliable" (ibid.). Identifiable projectile point styles from the site include Oxbow (n=3), McKean (n=3), Duncan (n=1), Hanna (n=1), Pelican Lake (n=1), Besant (n=10), and Late Prehistoric (n=5) (ibid.). The conclusions for this project reiterate those of Boughton et al. (1994; summarized above).

In 1998, mitigation was conducted at 32ME797 and 32ME1456 in response to impacts of expansion in the North Mine Extension Area (Walker-Kuntz and Boughton 1999). A relatively small amount of cultural material was recovered from 32ME797. In addition to the stone circle and cairn present at the site, lithic debitage indicates reduction activities occurred here (ibid.:7.3). One Pelican Lake projectile point provided cultural/temporal affiliation. No other conclusions were drawn about 32ME797. Similarly, 32ME1456 consisted of one stone circle and has been dated to the Besant complex based on the recovery of a Besant-type projectile point (ibid.:8.1). Blood residue analysis of stone tools indicates that bison and deer were part of the occupants' subsistence strategy (ibid.). Investigators suggest that the site functioned as an outlier to a larger base camp.

Mitigation was carried out at 32WI349 by excavating 47 shovel tests and 103 1-x-1-m excavation units. A temporary base encampment for nomadic peoples making their season rounds during the Late Plains Archaic (Besant and Avonlea complexes) was suggested (Morrison 2000). Four stone circles were investigated and a small area outside the rings. Flakes, cores, tested raw material, chipped and ground stone tools, projectile points, bone fragments, charcoal, and burned clay were recovered.

The Buffalo Hill Site (32ME1444) was mitigated by excavating 96 square meters. There were 26 features at the site (22 stone circles, 2 cairns, 2 stone sub rectangular geomorphs. A Prairie Side-Notched point was recovered along with a hearth and over 16,000 flakes (Olson 2001).

In 2004, data recovery was conducted at site 32MN525, a prehistoric open camp located on the White Earth River. A transient camp used intermittently during the Middle Plains Archaic and Plains Village periods is suggested with tool maintenance being the primary activity (Lee 2006).

Data recovery was conducted at nine sites that were to be destroyed by proposed expansion in the Freedom Mine Area 2 North, Mercer County (Bales et al. 2006). Seven stone feature sites, one cairn, and one lithic scatter were excavated. Radiocarbon dating of 11 samples from across the sites indicates two Middle Plains Archaic occupations and nine Plains Woodland occupations (ibid.:6.4). This finding is consistent with other stone circle sites in the Beulah Trench (ibid.:6.6). Diagnostic artifacts were recovered from five

sites. The styles include two McKean points, four Besant points, and nine Plains/Prairie side-notched points (ibid.). Ceramics recovered during excavation were typed to Plains Woodland and Plains Village. Several post-excavation observations made by investigators are worth noting. First, within the project area smaller stone circles tended to contain charcoal features and larger stone circles tended to contain diagnostic artifacts (ibid.:6.8). Second, during previous testing faunal remains were uncovered in two stone circles. Upon further investigation, neither of the stone circles contained diagnostic artifacts. The features were carbon dated using bone. Investigators suggest that the virtual absence of lithic material at a stone feature likely indicates that no tools will be recovered (ibid.:6.11). Third, based on a small sample size, it appears that there is not a correlation between rock density of a stone circle and the presence of centrally located hearths (ibid.). That is, the hearths located within the project area were excavated from stone circles with low rock densities. Finally, as stated after previous testing, the features that yielded the least amount of archaeological information were those containing faunal remains (ibid.:6.13).

The Beacon Island Agate Basin site (32MN234) is one of the most significant sites recorded within the GSU (Ahler 2003c; Mitchell 2012). The site is located on an island in Lake Sakakawea, presently managed by the US Army Corps of Engineers. Before construction of the Garrison Dam and Garrison Reservoir in 1967, the site was situated on a terrace overlooking the Missouri River valley to the southwest, the Little Knife River to the east, and the confluence of these rivers to the southeast (Ahler 2003c). Unfortunately, fluctuating lake levels have caused rapid erosion, endangering the site.

In the first decade of the 21st century more of the island was exposed due to low lake levels. Realizing the imminent fate of the site, archaeologists have documented, surveyed, and excavated during multiple field seasons. Remote sensing techniques have been utilized (Spurr et al. 2007). The Beacon Island Agate Basin site has been determined eligible for nomination to the NRHP by the Keeper of the Register.

Mitchell (2012) provides a detailed report of the archaeological record at Beacon Island. The site was an Agate Basin-age bison kill and processing area along the prehistoric Missouri River channel. There, hunters killed at least 29 *Bison antiquus* in early- to mid-winter (November to January) and the carcasses were moved a short distance for processing. The archaeological record indicates the hunters butchered some of the animals on-site, preparing and packing a portion of meat for transport, breaking open log bones with cobble to extract marrow, and re-tooling for the next kill. It appears that the high-utility forelimbs and hind limbs of the bison were transported off-site.

Absolute and relative dating techniques have been used to date the site. Four samples of identifiable bone (n=2) and charcoal (n=2) have been dated. The mean age of the samples is 10,326±28 radiocarbon years BP (ibid.:211). In addition to numerous Agate Basin projectile points, Clovis and Folsom points have been recovered (Ahler 2003c). One of the key elements of Agate Basin technology is the extensive reshaping or rejuvenation of broken point fragments. The toolkit the hunters brought to the Beacon Island site included projectile points, a selection of large flake tools needed for butchery,

and cores needed for flake production. During processing, the group recovered and recycled serviceable point fragments, leaving behind segments deemed unsuitable for further use as weaponry and points or fragments lost in butchered carcasses. The toolkits of the hunters at this site indicated the focus was on the butchering and processing of the kill.

Other Work

Most of the other works relate to Lake Sakakawea inundation and shoreline erosion after the lake was filled. Exceptions to the work necessitated by site destruction include Joyes' (1978) thunderbird glyph study and research conducted by the SHSND.

For a synthesis of archaeological investigations in the Dakota Prairie Grasslands, professional archaeologists, researchers, and students may consult *Prehistory on the Dakota Prairie Grasslands: An Overview* by Mervin G. Floodman (2012). The Dakota Prairie Grasslands, managed by the U.S. Forest Service, comprises portions of the GSU, Yellowstone River SU, and the Little Missouri River SU. Floodman's overview spans the Paleo period through the Equestrian/Fur Trade period (9500 BC - AD 1880), compiling data from pedestrian surveys, evaluative testing, and larger-scale excavation. For each period, at least one site case study is provided, including: Pretty Butte (32SL100); Marsh Hawk (32BI317); Cinnamon Creek Ridge (complex of sites); Ice Box Canyon (32MZ38); Abraxas (32MZ333); Stone Circle (32MZ721); Magpie Road (32BI286); complex of Mandan-Hidatsa eagle trapping sites; Five Spades (32BI503); Fantail Creek (32BI423/32MZ729); and the Clear Creek project (32MZ1474 and 32MZ1475). Additionally, tables offer radiocarbon and obsidian hydration dates for the LMRSU and YRSU and radiocarbon dates for the GSU.

Working with landowners is extremely important since who is better to know their land than the people caring for it. The Max site (32ML1350) is just one example where numerous Cody complex projectiles were recovered and a bison kill/butchering site is present. This site was recorded, and a summary of the collection was published by Root, Knell, Taylor (2013:134-136).

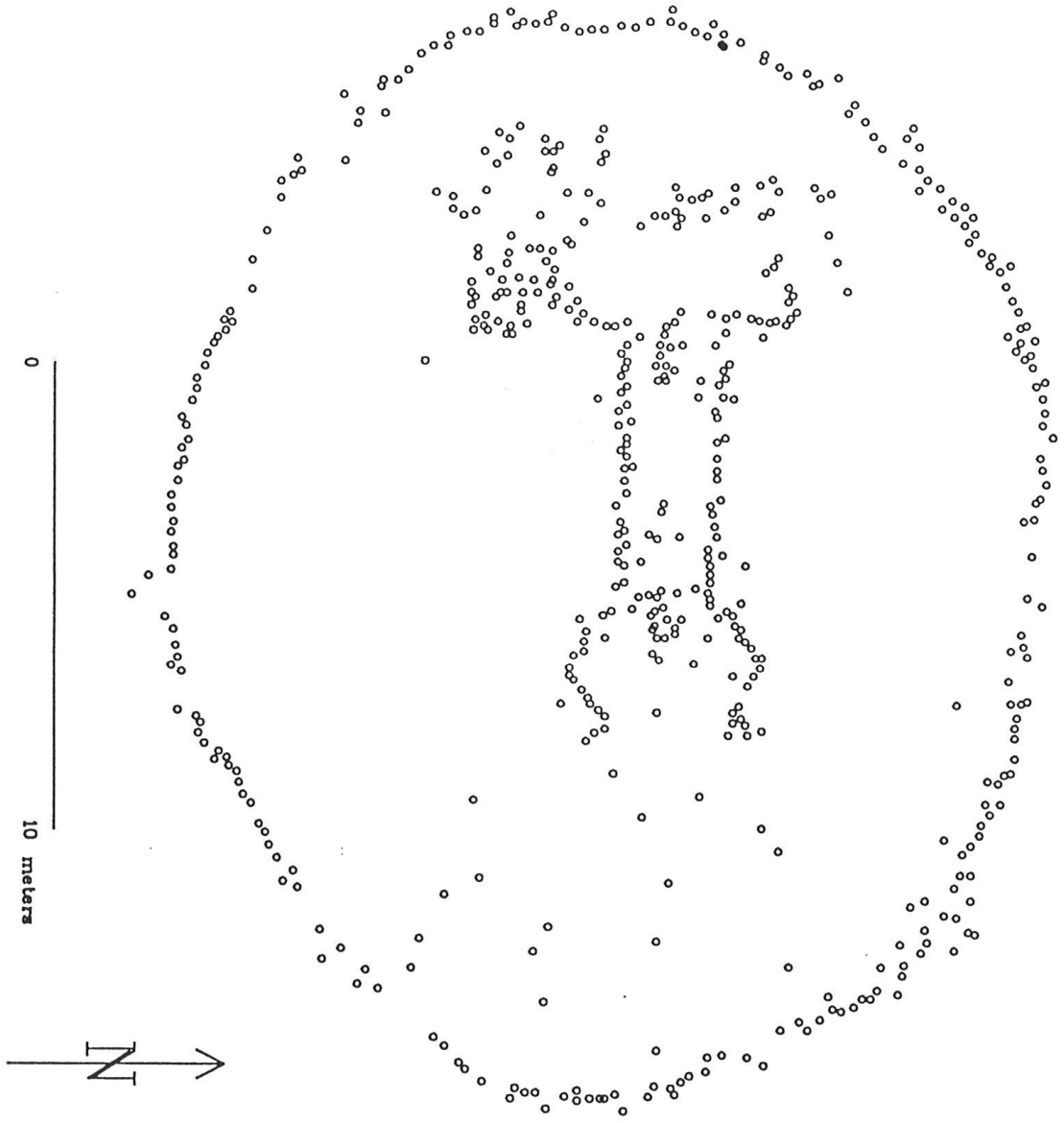
Significant rock feature sites have been reported and brought to the attention of archaeologists. Neither was the result of a federal undertaking. The first is the Grandmother's Second Lodge (32ME59) (Reed and Grinnell 2004) that is affiliated with the Mandan, Hidatsa, and Arikara Nation (MHAN). Nearby is a long linear rock feature (32DU1807) affiliated with the MHAN also.

Figure 6.2: Aerial Photograph of the Grandmother's Second Lodge site (32ME59), courtesy of Terry Wicklund at the North Dakota Department of Transportation.

In 1990, a Napi Effigy (32WI320) was brought to the attention of archaeologist working in the Williston area. This site consisted of a stone effigy of a man (NAPI) surrounded by a stone circle 22 meters in diameter, 14 stone circles, 5 "turtle" effigies, an arc of stone effigies, an arc of stone cairns, and an inscribed rock. The site has been mapped and aerial photographs taken of the features (Otto 1991 12[2]:7-10). Otto suggests it may be Algonquian in origin and possibly associated with the Blackfoot Tribe. In the newsletter article she goes on to state:

> According to Blackfoot legend, Napi was involved in creating the world. When he tired from his work, he rested. Upon arising he left his imprint on the ground, outlined in stone. Other stories about Napi report that he later became a trickster.

Figure 6.3: Sketch Map of the NAPI Effigy site (32WI320). Reproduced from Otto 1991:Figure 5.



Publications

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 wit4h 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.

The large villages and mounds sites caught the attention of many researchers early on. George Will, Russell Reid, Thad Hecker, Steinbruck (working for Brower and later the ND Historical Society), identified sites in this study unit. Alfred Bowers, Gilbert Wilson, Melvin Gilmore, and Francis Densmore worked closely with the Mandan, Hidatsa, and Arikara. James Howard, Francis Densmore, and Melvin Gilmore provide information from informants of Sioux tribes.

There are numerous publications regarding sites in this study unit prior to the requirements of under the National Historic Preservation Act. These publications are generally not in the Cultural Resource Manuscript Collection, but many are in the Archaeology & Historic Preservation Library or journal articles available in the State Archives or on-line. Many publications result from work completed for the River Basin Surveys related to dam constructions.

Prior to damming of the Missouri River, it was known that the construction of Garrison Project was going to affect several prominent earthlodge villages and other historic properties. Major salvage excavations were undertaken at a number of these sites by the SIRBS. Included were Star Village (Metcalf 1963), Rock Village (Hartle 1960; Lehmer et al. 1978), Night Walker's Butte (Lehmer et al. 1978), Grandmother's Lodge (Woolworth 1956), and Like-A-Fishhook Village (Smith 1972). Except for Grandmother's Lodge, a prehistoric Plains Village site, all the others are post-contact earthlodge villages. Star Village is an Arikara Village, Night Walker's Butte and Rock Village are Hidatsa Villages, and Like-A-Fishhook a Mandan, Hidatsa, and Arikara site. Salvage excavations were also carried out at two historic sites: Kipp's post, a fur trade post (Woolworth and Wood 1960, 1962), and Fort Stevenson, a military post (Smith 1960a). Archaeologists worked with MHA enrolled members and received information

regarding sites in the area. Information they provided is recorded in site forms and published reports regarding these excavations.

We have included several master's theses and PhD dissertations in Table 6.9 that are the result of work conducted in this study unit. Collections from these early studies continue to be utilized for graduate work and fellowships, as well as many other scholars.

It is critical for archaeologists to publish information gained from various investigations in addition to the technical reports (listed in above tables) that have limited distribution. The public support and understanding of the value of conducting these investigations is essential. As of 2021, we have added tables in each study unit of selected publications available to general audiences.

Table 6.9: Selected Published References for the Garrison Study Unit.

Author(s)	Year	Reference
Abel, Annie Heloise	1939	*Tabeau's Narrative of Loisel's Expedition to the Upper Missouri*. University of Oklahoma Press, Norman.
Ahler, Stanley A.	1977	Lithic Resource Utilization Patterns in the Middle Missouri Subarea. In Trends in Middle Missouri Prehistory: A Festschrift Honoring the Contributions of Donald J. Lehmer, edited by W. R. Wood. *Plains Anthropologist* Memoir No. 13, Pt. 2. 22(78):132-150.
Ahler, Stanley A.	1983	Heat Treatment of Knife River Flint. *Lithic Technology* 12:1-8.
Ahler, Stanley A.	1989	Mass Analysis of Flaking Debris: Studying the Forest Rather than the Tree. In *Alternative Approaches to Lithic Analysis*, edited by D. Henry and G. Odell, pp. 85-119.
Ahler, Stanley A.	1992	Use-Phase Classification and Manufacturing Technology in Plains Village Arrowpoints. In *Piecing Together the Past: Applications of Refitting Studies in Archaeology*, edited by Jack L. Hofman and James G. Enloe, pp. 36-62. BAR International Series 578, Oxford.
Ahler, Stanley A.	1993	Pre-Village Period Archeology in the KNRI. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part IV: Interpretation of the Archeological Record*, pp.15-31. National Park Service, Midwest Archeological Center, Lincoln.
Ahler, Stanley A.	1993	Architecture and Settlement Change in the Upper Knife-Heart Region. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part IV: Interpretation of the Archeological Record*, pp. 33-55. National Park Service, Midwest Archeological Center, Lincoln.
Ahler, Stanley A.	1993	Plains Village Cultural Taxonomy for the Upper Knife-Heart Region. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part IV: Interpretation of the Archeological Record* pp. 57-108. National Park Service, Midwest Archeological Center, Lincoln.
Ahler, Stanley A., and Michael McGonigal	2001	Agate Basin at Beacon Island, North Dakota. *Current Research in the Pleistocene* 18:1-3.
Ahler, Stanley A., George C. Frison, and Michael McGonigal	2002	Folsom and Other Paleoindian Artifacts in the Missouri River Valley, North Dakota. In *Folsom Technology and Lifeways*, edited by John E. Clark and Michael B. Collins, pp. 69-112. Lithic Technology Special Publication No. 4. University of Tulsa, Tulsa, Oklahoma.
Ahler, Stanley A., and Phil R. Geib	2000	Why Flute? Folsom Point Design and Adaptation. *Journal of Archaeological Science* 27(9):799-820.

Author(s)	Year	Reference
Ahler, Stanley A. (editor)	1994	*A Working Manual for field and Laboratory Techniques and Methods for the 1992-1996 Lake Ilo Archaeological Project*. Quaternary Studies Program, Northern Arizona University.
Ahler, Stanley A., and Amy Drybred	1993	Analysis of Euroamerican Trade Artifacts. *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part III: Analysis of the Physical Remains.* National Park Service, Midwest Archeological Center, Lincoln.
Ahler, Stanley A., and Herbert Haas	1993	The KNRI Phase I Chronometric Subprogram. In *The Phase I Archaeological Research Program for the Knife River Indian Villages National Historic Site, Part I,* edited by Thomas Thiessen, pp. 115-166. Occasional Studies in Anthropology 27. National Park Service, Midwest Archaeological Center, Lincoln.
Ahler, Stanley A., and Anthony A. Swenson	1985	*A Manual for Describing and Coding Ceramic Vessels from the Knife-Heart Region of the Middle Missouri Subarea, North Dakota*. Contribution No. 227. Department of Anthropology, University of North Dakota, Grand Forks.
Ahler, Stanley A., and Anthony A. Swenson	1993	KNRI and Upper Knife-Heart Region Pottery Analysis. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part III: Analysis of the Physical Remains*. National Park Service, Midwest Archeological Center, Lincoln.
Ahler, Stanley A., Thomas D. Thiessen, and Michael K. Trimble	1991	*People of the Willows: The Prehistory and Early History of the Hidatsa Indians*. University of North Dakota Press, Grand Forks.
Ahler, Stanley A., and Dennis L. Toom	1993	KNRI and Upper Knife-Heart Region Lithic Artifact Analysis. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part III: Analysis of the Physical Remains.* National Park Service, Midwest Archeological Center, Lincoln.
Ahler, Stanley A., Lynn M. Snyder, Carl R. Falk, and Holmes A. Semken, Jr.	1993	KNRI and Upper Knife Heart Region Unmodified Faunal Remains. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part III: Analysis of the Physical Remains.* National Park Service, Midwest Archeological Center, Lincoln.
Artz, Joe Alan	2000	Archaeology and Earth Sciences on the Northern Plains. In *Geoarchaeology in the Northern Plains*, edited by Rolfe D. Mandel, pp. 250-285. University of Oklahoma Press, Norman, Oklahoma.
Audubon, Maria	1960	Audubon and His Journal, 2 vols. In *Notes by Elliot Coues*. New York.
Baker, Gerard	2014	The Missouri River: The Backbone to Survival. In *Dam Projects and the Growth of American Archaeology: The River Basin Surveys and the Interagency Archeological Salvage Program*, edited by Kimball M. Banks and Jon S. Czaplicki.
Bales, Jennifer R., and Kenneth L. Kvamme	2005	Geophysical Signatures of Earthlodges in the Dakotas. In *Plains Earthlodges: Ethnographic and Archaeological* Perspectives, edited by D. C. Roper and E. P. Pauls. University of Alabama Press, Tuscaloosa.
Banks, Kimball, and Jon S. Czaplicki (editors)	2014	*Dam Projects and the Growth of American Archaeology: The River Basin Surveys and the Interagency Archeological Salvage Program.* Left Coast Press, Walnut Creek, California.
Bass, William M., John B. Gregg, M. D., and Pierre E. Provost	1974	Ankylosing Spondylitis (Marie Strumpel Disease) in Historic and Prehistoric Northern Plains Indians. *Plains Anthropologist* 19(66):303-305.
Baugh, T. G., and F. W. Nelson, Jr.	1988	Archaeological Obsidian Recovered from Selected North Dakota Sites and its Relationship in Changing Exchange Systems in the Plains. *Journal of the North Dakota Archaeological Association* 3:74-94.
Beckes, Michael R., Tom Jorstad, Thomas L. Burge, Tom East, and J.	1987	Preliminary Archeological and Geological Analyses at the Antelope Quarry Site, 32MZ330, McKenzie County, North Dakota. *Archaeology in Montana* 28(1):11-26.

Author(s)	Year	Reference
Donahue		
Berry, J. J.	1978	Arikara Middlemen: The Effects of Trade on an Upper Missouri Society. PhD dissertation, Anthropology, Indiana University, Bloomington.
Billeck, William T.	2016	Ethnographic and Historical Evidence for Glass Pendant Function in the Plains. *Plains Anthropologist* 61(240):410-424.
Blikre, Lowell R.	1993	Cultural Implications of the Prehistoric Distribution of Sentinel Butte Flint in Western North Dakota. Master's thesis, Department of Anthropology, Northern Arizona University, Flagstaff.
Bodmer, Karl, Hunt, David C., and Marsha V. Gallagher	1984	*Karl Bodmer's America*. University of Nebraska Press, Lincoln.
Boller, Henry A.	1869	*Among the Indians: Eight Years in the Far West 1858-1866*. Edited by Milo Milton Quaife. Chicago.
Boller, Henry A.	1966	Journal of a Trip to, and Residence in, the Indian Country, Commenced Saturday, May 22, 1858. *North Dakota History: Journal of the Northern Plains* 33(3):260-315.
Boller, Henry A.	2008	*Twilight of the Upper Missouri River Fur Trade: The Journals of Henry A. Boller*, edited and with an introduction by W. Raymond Wood. State Historical Society of North Dakota, Bismarck.
Bowers, Alfred	1940	*Missouri River Earthlodge Archaeology of North Dakota and South Dakota*. Logan Museum, Beloit College, Wisconsin.
Bowers, Alfred	1948	*A History of the Mandan and Hidatsa.* PhD dissertation, Department of Anthropology, University of Chicago, Chicago.
Bowers, Alfred	1950	*Mandan Social and Ceremonial Organization*. University of Chicago Press, Chicago.
Bowers, Alfred	1963	*Hidatsa Social and Ceremonial Organization.* University of Nebraska Press.
Bozell, John R., Carl R. Falk, and Eileen Johnson	2011	Native American Use of Animals on the North American Great Plains. In *Subsistence Economies of Indigenous North American Societies: A Handbook*, edited by Bruce D. Smith, pp 353-385. Smithsonian Institution, Washington, DC.
Brink, Jack W.	2004	The Lessons of Buffalo Bird Woman: Faunal Abundance and Representation from Plains Oral History. In *Archaeology on the Edge: New Perspectives from the Northern Plains*, edited by Brian Kooyman and Jane Kelly, pp. 157-185. University of Calgary Press, Calgary.
Brower, J. F.	1904	*Mandan Memoirs of Explorations in the Basin of Mississippi*. Press of McGill-Warner, St. Paul, Minnesota.
Bushnell, David I., Jr.	1922	*Villages of the Algonquian, Siouan, and Caddoan Tribes West of the Mississippi*. Smithsonian Institution, Bureau of American Ethnology Bulletin 77. U.S. Government Printing Office, Washington, DC.
Butler, William B.	1975	Two Initial Middle Missouri Tradition Tool Kits. *Plains Anthropologist* 20(67):53-59.
Calabrese, F.	1973	Discriminant Analysis of Certain Middle Missouri Tradition Projectiles. *Plains Anthropologist* 18(62):344-349.
Caldwell, Warren W.	1964	Fortified Villages in the Northern Plains. *Plains Anthropologist* 9(23):1-7.
Caldwell, Warren W.	1966	The Middle Missouri Tradition Reappraised. *Plains Anthropologist* 11(32):152-157.
Caldwell, Warren W., and G. Hubert Smith	1961	*Garrison Reservoir: Geology, Paleontology, Archeology, History*. Interagency Archeological Salvage Program.
Callaway, Graham A.	2018	The Lieutenant G.K. Warren Maps: Charting the Upper Missouri River in 1856. *North Dakota History: Journal of the Northern Plains* 83.1:3-17.
Camp, Gregory S.	2005	Triumph and Tragedy: The Return Home. *North Dakota History: Journal of the Northern Plains* 72(3 and 4):38-57.
Carlson, Caitlin	2014	*The Importance of Being New Town*. On file at the AHP Division of the

Author(s)	Year	Reference
		SHSND (MS14850).
Casler, Michael M. (editor)	2007	*The Original Journal of Charles Larpenteur: My Travels to the Rocky Mountains Between 1833 and 1872 by Charles Larpenteur.* The Museum Association of the American Frontier, Chadron, Nebraska.
Catlin, George	1973	*Letters and Notes on the Manners, Customs, and Conditions of North American Indians*, Vol. 1. Dover Publications, New York.
Chardon, Francis A.	1932	*Chardon's Journal at Fort Clark, 1834-1839*, edited by Annie Heloise Abel. South Dakota State Department of History, Pierre.
Chittendon, Hiram M.	1954	*The American Fur Trade of the Far West: A History of the Pioneer Trading Posts and Early Fur Companies of the Missouri Valley and the Rocky Mountains and of the Overland Commerce with Santa Fe.* 2 vol. Reprinted. Academic Reprints, Stanford California. Originally published 1935, Press of the Pioneers, New York.
Chomko, Stephen A.	1986	The Ethnohistorical Setting of the Upper Knife-Heart Region. In *Papers in Northern Plains Prehistory and Ethnohistory: Ice Glider, 32OL110*, edited by W. Raymond Wood, pp. 59-96. Special Publication 10. South Dakota Archaeological Society, Sioux Falls.
Chomko, S. A., and W. R. Wood	1973	Linear mounds in the Northeastern Plains. *Archaeology in Montana* 14(2):1-19.
Clark, F.	1984	Knife River Flint and Interregional Exchange. *Midcontinental Journal of Archaeology* 9:173-198.
Coues, Elliott	1893	*History of the Expedition Under the Command of Lewis and Clark*, Vol. 1. Francis P. Harper, New York.
Coues, Elliott	1897	*New Light on the Early History of the Greater Northwest: The Manuscript Journals of Alexander Henry and David Thompson 1799-1814.* Suckling and Co., London.
Coues, Elliot (editor)	1962	*Forty Years as a Fur Trader on the Upper Missouri: The Personal Narrative of Charles Larpenteur, 1883-1872*. Reprint. Vol. 1. Minneapolis, Minnesota.
Davis, Leslie B.	1978	Twentieth Century Commercial Mining of Northern Plains Bison Kills. In Bison Procurement and Utilization: A Symposium. *Plains Anthropologist, Memoir* No. 14 23(82), Pt. 2.
Darnell, Regna	2001	Plains Cree. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
DeMallie, Raymond J.	2001	Sioux Until 1850. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
DeMallie, Raymond	2001	Yankton and Yanktonai. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
DeMallie, Raymond, and David Reed Miller	2001	Assiniboine. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
DeMallie, Raymond	2001	Teton. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
Dempsey, Hugh A.	2001	Blackfoot. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
Denig, Edwin Thompson	1930	*Indian Tribes of the Upper Missouri*. Edited by J. N. B. Hewitt, BAE 46th Annual Report 1828-1829, pp.375-628.
Dunn, Adrian R.	1963	History of Old Fort Berthold. *North Dakota History*: *Journal of the Northern Plains* 30(4):157-240.
Eighmy, Jeffrey L., Randall S. Taylor, and Pamela Y. Klein	1993	Middle Missouri Archaeomagnetic Dating on the Great Plains. *Plains Anthropologist* 38(142):21-50.
Ewers, John C.	1937	*Teton Dakota Ethnology and History.* NPS, Berkeley.
Ewers, J. C.	1961	*Five Indian Tribes of the Upper Missouri: Sioux, Arikaras, Assiniboines, Crees, Crows*. Written by Edwin Thompson Denig. University of Oklahoma

Author(s)	Year	Reference
		Press, Norman.
Ewers, J. C.	1968	*Indian Life on the Upper Missouri*. University of Oklahoma Press, Norman.
Fawcett, William B., Jr.	1988	Changing Prehistoric Settlement Along the Middle Missouri River: Timber Depletion and Historical Context. *Plains Anthropologist* 33(119):67-94.
Fenenga, Franklin	1954	Ice-Glider Game of the Northern Plains. *Plains Anthropologist* 1(1):31-38.
Fisher, Abigail E.	2019	When is a Wolf a Dog? Combined Geometric Morphometrics and Stable Isotope Analyses for Differentiating Wild from Domestic Canids on the Northern Plains. *Plains Anthropologist* 64(252):316-349.
Fredlund, Dale E.	1976	Fort Union Porcellanite and Fused Glass: Distinctive Lithic Materials of Coal Burn Origin on the Northern Plains. *Plains Anthropologist* 21(73:1):207-211.
Gilmore, Melvin R.	1919	*Uses of Plants by the Indians of the Missouri River Region*. Bureau of American Ethnology 33rd Annual Report. Smithsonian Institution, Washington, DC.
Gilmore, Melvin R.	1925	Arikara Uses of Clay and Other Earth Products. *Indian Notes* 2(4):283-289.
Gilmore, Melvin R.	1929	*Prairie Smoke*. Columbia University Press, New York.
Glenn, James R.	1994	The River Basin Surveys Program. *Journal of the North Dakota Archaeological Association* 5:5-14.
Green, Candace S.	2020	The Hazen Collection: A New Source on Arikara Material Culture. *Plains Anthropologist* 65(256):357-377.
Green, William, William T. Billeck, Fern E. Swenson, and George R. Holley	2016	Glass Bead Inlaid Pottery from the Northern Plains. *Plains Anthropologist* 61(240):425-448.
Green, William, Norman A. Bowers, Calvin Grinnell, Stanley A. Ahler, and Thomas D. Thiessen	2018	Alfred W. Bowers' History of the Mandan and Hidatsa: A Significant Resource for Plains Anthropology. *Plains Anthropologist* 63(246):113-133.
Griffin, J. B., A. A. Gordus, and G. A. Wright	1969	Identification of the Sources of Hopewellian Obsidian in the Middle West. *American Antiquity* 34:1-14.
Griffitts, Janet	2007	Stability and Change in Bone Tool Use along the Middle Missouri, North Dakotas. In *Bones as Tools: Current Methods and Interpretations in Worked Bone Studies*, edited by Christian Gates St-Pierre and Renee B. Walker, pp.93-105. BAR International Series 1622. British Archaeological Reports, Oxford.
Grinnell, George B.	1979	Indian Trap Pits on the Missouri. *American Anthropologist* 19(1):148.
Hall, C. L.	1906	The Mandans and the Groventres Five Knife River Villages. *Collections of the State Historical Society of North Dakota* Vol. 1:433-443.
Hanson, James A.	2005	*When Skins were Money: A History of the Fur Trade*. Museum of the Fur Trade, Chadron, Nebraska.
Hanson, Jeffery R.	1979	Ethnohistorical Problems in the Crow-Hidatsa Separation. *Archaeology in Montana* 20(3):73-86.
Hanson, Jeffery R.	1983	Changes in Hidatsa Residence Patterns: A Cross-Cultural Interpretation. *Plains Anthropologist* 28(99):69-75.
Hanson, Jeffery R.	1984	Bison Ecology in the Northern Plains and a Reconstruction of Bison Patterns for the North Dakota Region. *Plains Anthropologist* 29(104):93-113.
Hanson, Jeffery R.	1986	Adjustment and Adaptation on the Northern Plains: The Case of Equestrianism Among the Hidatsa. *Plains Anthropologist* 31(112):93-107.
Hanson, Jeffery R.	1993	Hidatsa Ethnohistory. In *The Phase I Archeological Research Program for the Knife River Indian Villages Nation Historic Site Part II: Ethnohistorical Studies.* National Park Service, Midwest Archeological Center, Lincoln.

Author(s)	Year	Reference
Hartle, Donald D.	1960	Rock Village: An Ethnohistorical Approach to Hidatsa Archaeology. PhD dissertation, Department of Anthropology, Columbia University, New York.
Hecker, Thad C.	1948	Mandan-Arikara Pottery. *Plains Archeological Conference News Letter* Vol. 1(4), reprinted 1961.
Hartle, D.	1960	*Rock Village: An Ethnohistorical Approach to Hidatsa Archaeology*. PhD dissertation, Department of Anthropology, Columbia University, New York.
Henning, Dale R.		Continuity and Change in the Eastern Plains, A.D. 800-1700: An Examination of Exchange Patterns. In *Plains Village Archaeology: Bison-hunting Farmers in the Central and Northern Plains*, ed. By S. A. Ahler and M. Kay, pp. 67-82. University of Utah Press, Salt Lake City.
Hoffman, C.W.	1906	The Process of Tanning Skins by Indians. *North Dakota Historical Society Collection*, Vol 1, pp 455-456.
Hollenback, Kacy L.	2012	*Disaster, Technology, and Community: Measuring Responses to Smallpox Epidemics in Historic Hidatsa Villages, North Dakota*. PhD dissertation, School of Anthropology, University of Arizona, Tucson.
Hollenback, Kacy L., and Richard A. Krause	2016	Sahnish Then and Now: Past and Current Themes in Arikara Archaeology and Anthropology. *Plains Anthropologist* 61(240):291-307
Howard, James H.	1965	*The Plains-Ojibwa or Bungi: Hunters and Warriors of the Northern Plains*. Anthropological Papers No. 1 South Dakota Museum, University of South Dakota, Vermillion.
Howard, James H.	1974	The Arikara Buffalo Society Medicine Bundle. *Plains Anthropologist* 19(66):241-271.
Howard, James H.	1976	Yanktonai Ethnohistory and the John K. Bear Winter Count. *Plains Anthropologist Memoir* No. 11 21(73):1-78.
Hrdlicka, Ales	1916	Indian Trap Pits along the Missouri. *American Anthropologist* 18(4):546-547.
Hunt, William J.	1994	Fort Floyd: An Enigmatic Nineteenth-Century Trading Post. *North Dakota History: Journal of the Northern* Plains 61(2):7-20.
Hurt, Wesley R.	1969	Seasonal Economic and Settlement Patterns of the Arikara. *Plains Anthropologist* 14(43):32-37.
Hyde, George E.	1952	The Mystery of the Arikaras. *North Dakota Historical Quarterly* 18 and 19(4 and 1).
Jantz, Richard L.	1972	Cranial Variation and Microevolution in Arikara Skeletal Populations. *Plains Anthropologist* 17(55):20-35.
Jantz, Richard L., Douglas W. Owsley, and Patrick Willey	1981	Craniometric Variation in the Northern and Central Plains. *Plains Anthropologist* Memoir No. 7 26(94):19-30.
Jantz, Richard L., and Patrick Willey	1983	Temporal and Geographic Patterning of Relative Head Height in the Central Plains and Middle Missouri Areas. *Plains Anthropologist* 28(99):59-68.
Jenkinson, Clay S. (editor)	2003	*A Vast and Open Plain: The Writings of the Lewis and Clark Expedition in North Dakota, 1804-1806*. State Historical Society of North Dakota, Bismarck.
Johnson, Ann M., and W. Raymond Wood	1973	High Butte, 32ME13: A Missouri Valley Woodland-Besant Site. *Archaeology in Montana* 14(3):35-83.
Johnson, Craig M.	1984	Time, Space, and Cultural Traditions as Factors in Lithic Resource Exploitation in the Middle Missouri Subarea. *Plains Anthropologist* 29(106):289-302.
Johnson, Craig M.	1998	The Coalescent Tradition. In *Archaeology on the Great Plains,* edited by W. R. Wood, pp. 308-344. University Press of Kansas, Lawrence.
Johnson, Craig M.	2007	*A Chronology of Middle Missouri Plains Village Sites*. Smithsonian Contributions to Anthropology, 47, Smithsonian Institution Scholarly Press, Washington, DC.
Johnson, Craig M.	2019	*Chipped Stone Technological Organization: Central Place Foraging and*

Author(s)	Year	Reference
		Exchange on the Northern Great Plains. University of Utah Press, Salt Lake City.
Jones, Geoffrey, and Gene Munson	2005	Geophysical Survey as an Approach to the Ephemeral Campsite Problem: Case Studies from the Northern Plains. *Plains Anthropologist* 50:31-43.
Jones, Travis W., Robert J. Speakman, William T. Billeck, and Robert J. Hoard	2019	A Multi-regional Obsidian Database for the Eastern Plains. *Plains Anthropologist* 64(250):143-162.
Kay, Marvin	2007	The Best and the Brightest. In *Plains Village Archaeology: Bison-Hunting Farmers on the Central and Northern Plains*, edited by Stanley A. Ahler and Marvin Kay. University of Utah Press, Salt Lake City.
Keeley, Lawrence H., Marisa Fontana, and Russell Quick	2007	Baffles and Bastions: The Universal Features of Fortifications. *Journal of Archaeological Research* 15:55-95.
Kessel, Ralph	1972	A Structural Analysis of a Mandan Myth. *Plains Anthropologist* 17(55):11-19.
Key, Patrick J.	1983	*Craniometric Relationships Among Plains Indians. Report of Investigations*. University of Tennessee, Department of Anthropology, Knoxville.
Keyser, James D., and John L. Fagan	1987	ESP: Procurement and Processing of Tongue River Silicified Sediment. *Plains Anthropologist* 32(117):153-194.
King, Charles R.	1991	Dr. James L. Neave at Fort Berthold, Dakota Territory, 1878-1885. *North Dakota History: Journal of the Northern Plains* 57(4):21-34.
Krause, Richard A.	1994	Paper Sacks, Paste-Board Boxes, and Intellectual Bins: The River Basin Salvage Program and Archaeological Classification. *Journal of the North Dakota Archaeological Association* 5:27-38
Krause, Richard A.	2016	An Explication of Arikara Culture History. *Plains Anthropologist* 61(240):308 335.
Krause, Richard A.	2019	Ethnocentrism and Arikara History. *Plains Anthropologist* 64(22):350-381.
Krause, Richard A., and Kacy L. Hollenback	2016	A Brief Context-dependent Study of Arikara Ceramic Change. *Plains Anthropologist* 61(240):394-409.
Kuehn, David D.	1982	Quaternary Erosion and the Availability of Lithic Resources within the Badlands of North Dakota. *Journal of the North Dakota Archaeological Association* 1:43-54.
Kuehn, David D.	1997	A Geoarchaeological Assessment of Bison Kill Site Preservation in the Little Missouri Badlands. *Plains Anthropologist* 42:319-328.
Kurz, Rudolph Friederich	1937	*Journal of Rudolph Friederich Kurz: An Account of His Experiences Among Fur Traders and American Indians on the Mississippi and the Upper Missouri Rivers During the Years 1846 to 1852*. Translated by Myrtis Jarrell and edited by J. N. B. Hewitt. Smithsonian Institution Bureau of American Ethnology Bulletin 115.
Kvamme, Kenneth L.	2003	Multidimensional Prospecting in North American Great Plains Village Site. *Archaeological Prospection* 10:131-142.
Kvamme, Kenneth L.	2003	Geophysical Surveys as Landscape Archaeology. *American Antiquity* 68:435-457.
Kvamme, Kenneth L.	2006	Magnetometry: Nature's Gift to Archaeology. In *Remote Sensing in Archaeology: An Explicitly North American Perspective*, edited by Jay K. Johnson, pp 205-233. University of Alabama Press, Tuscaloosa.
Kvamme, Kenneth L.	2007	Geophysical Mappings and Findings in Northern Plains Village Sites. In *Plains Village Archaeology: Bison Hunting Farmers in the Central and Northern Plains*, edited by Stanley A. Ahler and Marvin Kay, pp. 210-221. University of Utah Press, Salt Lake City.
Larpenteur, Charles	1989	*Forty Years a Fur Trader on the Upper Missouri: The Personal Narrative of Charles Larpenteur, 1833-1872,* edited by Elliott Coues. University of

Author(s)	Year	Reference
		Nebraska Press, Lincoln.
Lass, William E.	1994	The History and Significance of the Northwest Fur Company, 1865-1869. *North Dakota History: Journal of the Northern Plains* 61(3):21-40.
Lehmer, Donald J.	1971	*Middle Missouri Archeology*. National Park Service Anthropological Papers 1. U.S. Government Printing Office, Washington, DC.
Lehmer, Donald J.	1977	The Other Side of the Fur Trade. In *Selected Writings of Donald J. Lehmer* pp 91-104. J & L Reprints, Lincoln, Nebraska.
Lehmer, Donald J.	1977	Epidemics Among the Indians of the Upper Missouri. In *Selected Writings of Donald J. Lehmer*, pp 105-111. J & L Reprint. Lincoln, Nebraska.
Lehmer, Donald J., W. Raymond Wood, Christopher L. Dill,	1978	*The Knife River Phase*. Department of Anthropology and Sociology, Dana College, Blair, Nebraska. Submitted to USDI, Interagency Archaeological Services, Denver. Report produced for the National Park Service. Interagency Archeological Services-Denver.
Lensink, Stephen C.	2005	This Old Earthlodge Village: How Long Were Sites of the Middle Missouri Tradition Occupied. In *Plains Earthlodges: Ethnographic and Archaeological Perspectives*, edited by Donna C. Roper and Elizabeth P. Pauls, pp. 132-156. University of Alabama Press, Tuscaloosa.
Lippincott, Kerry	2007	Nightwalker's Buttes: A Study in the Closing of an Archaeological Tradition and an Example of Hidatsa Oral History. *In Plains Village Archaeology: Bison-Hunting Farmers on the Central and Northern Plains*, edited by Stanley A. Ahler and Marvin Kay. University of Utah Press, Salt Lake City.
Logan, Wilford D.	1967	Archeological Salvage in the Missouri Basin. *North Dakota History* 34(2):161-171.
Lowie, Robert H.	1909	*The Assiniboine*. Anthropological Papers of the American Museum of Natural History 1. New York.
Lowie, Robert H.	1913	Societies of the Hidatsa and Mandan Indians. *American Museum of Natural History, Anthropological Papers* 11(Pt. 3):219-358.
Lowie, Robert H.	1917	Notes on the Social Organization and Customs of the Mandan, Hidatsa, and Crow Indians. *American Museum of Natural History, Anthropological Papers* 21 (Pt. 1).
Lowie, Robert H.	1922	*The Material Culture of the Crow Indians*. Anthropological Papers of the American Museum of Natural History 21(3). New York.
Majewski, Teresita	2009	Lessons for Historical Archaeology from the Career of W. Raymond Wood. *Plains Anthropologist* 54(210):113-120.
Mandel, Rolfe D., Laura R. Murphy, and Mark D. Mitchell	2014	Geoarchaeology and Paleoenvironmental Context of the Beacon Island Site, an Agate Basin (Paleoindian) Bison Kill in Northwestern North Dakota, USA. *Quaternary International* 342:91-113.
Matthews, Washington	1969	Reissue of Ethnography and Philology of the Hidatsa Indians. *Plains Anthropologist* 14(45):177-252.
Mattison R. J. (editor)	1966	The Letters of Henry A. Boller: Upper Missouri River Fur Trader. *North Dakota History* 33(2):106-219.
Malouf, Carling	1963	*Crow-Flies-High (32MZ1): A Historic Hidatsa Village in Garrison Reservoir Area, North Dakota*. River Basin Survey Papers, No 29, BAE Bulletin No:185:133-166.
Mattison, Ray H.	1958	The Indian Frontier on the Upper Missouri to 1865. *Nebraska History* 39:241-266.
Mattison, Ray H.	1961	The Upper Missouri Fur Trade, Its Methods of Operation. *North Dakota History* 42:1-28.
Maximilian, Prince of Wied	2010	*The North American Journals of Prince Maximilian of Wied*, edited by Stephen S. Witte and Marsha V. Gallagher, Vol. 2. University of Oklahoma Press, Norman.
Maximilian, Prince of Wied	2012	*The North American Journals of Prince Maximilian of Wied*, edited by Stephen S. Witte and Marsha V. Gallagher, Vol. 3. University of Oklahoma Press, Norman.

Author(s)	Year	Reference
MacDonald, D.	1999	Modeling Folsom Mobility, Mating Strategies, and Technological Organization in the Northern Plains. *Plains Anthropologist* 44:141-161.
McDermott, John F. (editor)	1951	*Up the Missouri with Audubon: The Journal of Edward Harris.* University of Oklahoma Press, Norman.
McFarling, Lloyd (editor)	1955	*Exploring the Northern Plains 1804-1876*. The Caxton Printers, Caldwell, Idaho.
McMillan, R. Bruce	2009	W. Raymond Wood's Interdisciplinary Approach to Archaeology. *Plains Anthropologist* 54(210):101-112.
McMillan, R. Bruce	2019	Underwater Spirits and Sacred Places: Artesian Springs in Southwestern Missouri. *Plains Anthropologist* 64(252):382-413.
Metcalf, George	1963	*Star Village: A Fortified Historic Arikara Site in Mercer County, North Dakota*. Smithsonian Institution, Bureau of American Ethnology, Bulletin 185, pp.57-122. Government Printing Office, Washington, DC.
Metcalf, George	1963	*Small Sites on and about Fort Berthold Indian Reservation, Garrison Reservoir, North Dakota*. Smithsonian Institution, Bureau of American Ethnology, Bulletin 185, River Basin Surveys Paper 26:1-56
Meyer, R. W.	1977	*The Village Indians of the Upper Missouri, the Mandans, Hidatsas and Arikaras*. University of Nebraska Press, Lincoln.
Mitchell, Mark D.	2013	*Crafting History in the Northern Plains: A Political Economy of the Heart River Region, 1400-1750*. University of Arizona Press, Tucson.
Mitchell, Mark D.	2018	Modeling Middle Missouri Warfare. In *Archaeological Perspectives on Warfare on the Great Plains*, edited by Andrew J. Clark and Douglas B. Bamforth, pp 275-294. University Press of Colorado, Louisville.
Morey, Darcy F.	1986	Studies on Amerindian Dogs: Taxonomic Analysis of Canid Crania from the Northern Plains. *Journal of Archaeological Science* 13-119-145.
Morgan, Lewis H.	1963	The Stone and Bone Implements of the Aricakares. *North Dakota History: Journal of the Northern Plains* 30(2-3)115-135.
Moulton, Gary E. (editor)	1983-2001	*The Journals of the Lewis and Clark Expedition*. Vols. 1-13. University of Nebraska Press, Lincoln.
Murray, Wendi Field, and Fern E. Swenson	2016	Situational Sedentism: Post-Contact Arikara Settlement as Social Process in the Middle Missouri, North Dakota. *Plains Anthropologist* 61(240):336-360.
Nasatir, Abraham P. (editor)	1952	*Before Lewis and Clark: Documents Illustrating the History of the Missouri, 1785-1804*. 2 vols. St. Louis Historical Documents Foundation, St. Louis.
Neill, Edward D.	1884	Life Among the Mandans and Gros Ventres Eighty Years Ago. *American Antiquarian* 6:248-253 and 377-384.
Neuman, R. W.	1975	*The Sonota Complex and Associated Sites on the Northern Great Plains*. Publications in Anthropology No. 6, Nebraska State Historical Society, Lincoln.
Neuman, Thomas M.	1955	Documentary Sources on the Manufacture of Pottery by the Indians of the Central Plains and Middle Missouri. *Plains Anthropologist* 2(4):13-20.
Nickel, Robert K.	2007	Cultigens and Cultural Traditions in the Middle Missouri. In *Plains Village Archaeology: Bison-Hunting Farmers on the Central and Northern Plains*, edited by Stanley A. Ahler and Marvin Kay. University of Utah Press, Salt Lake City.
Orser, Charles E.	1980	Toward a Partial Understanding of Complexity in Arikara Mortuary Practice. *Plains Anthropologist* 25(88):113-120.
Orser, Charles E.	1984	Trade Good Flow in Arikara Villages: Expanding Ray's "Middleman Hypothesis". *Plains Anthropologist* 29(103):1-12.
Orser, Charles E., and Douglas W. Owsley	1982	Using Arikara Osteological Data to Evaluate an Assumption of Fur Trade Archaeology. *Plains Anthropologist* 27(97):195-204.
Orser, Charles E., and Larry J. Zimmerman	1984	A Computer Simulation of Euro-American Trade Good Flow to the Arikara. *Plains Anthropologist* 29(105):199-210.
Otto, Becky J.	1991	NAPI Effigy Recorded Near Williston: A Preliminary Report. *North Dakota*

Author(s)	Year	Reference
		Archaeological Association Newsletter 12(2):7-10.
Owsley, Douglas W., and Steve A. Symes	1981	Morphological Differences between Mandan and Historic Arikara Crania. *Plains Anthropologist* Memoir No. 17 26(94):49-56.
Parks, Douglas R.	2001	Arikara. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
Peele, Franklin	1869	"Communication on the manufacture and ornamentation of the pottery of the stone age". *Proceedings of the American Philosophical Society* 10(78):430-435. Philadelphia.
Plamondon, Martin	2000	*Lewis and Clark Trail Maps: A Cartographic Reconstruction*, Vol. 1. Washington State University Press, Pullman.
Picha, Paul R.	2009	Joseph N. Nicollet and Great Plains Ethnohistory: Interfaces among Nineteenth-Century French Science, Enlightenment, and Revolution. *Plains Anthropologist* 54(210):155-162.
Plamondon, Martin	2000	*Lewis and Clark Trail Maps: A Cartographic Reconstruction*. Washington State University Press, Pullman.
Posthumus, David C.	2016	Hereditary Enemies? An Examination of Sioux-Arikara Relations Prior to 1830. *Plains Anthropologist* 61(240):361-382.
Ray, Arthur J.	1974	*Indians in the Fur Trade: Their Role as Trappers, Hunters, and Middlemen in the Lands Southwest of the Hudson Bay.* University of Toronto Press, Toronto.
Reid, Russell	1930	The Earth Lodge. *North Dakota Historical Quarterly* 4(3): 174-185
Reid, Russell	1943	The Diary of Ferdinand Van Ostrand. *North Dakota Historical Quarterly*, Vol 1.
Reid, Russell	1947-48	Lewis and Clark in North Dakota. *North Dakota History* 14, 15:212-214.
Rhonda, James P.	2001	*Finding the West: Explorations with Lewis and Clark*. University of New Mexico Press, Albuquerque.
Rogers, J. Daniel	1990	*Objects of Change: The Archaeology and History of Arikara Contact with Europeans.* Smithsonian Institution, Washington, DC.
Roper, Donna C.	2005	Earthlodge Dynamics 101: Construction and Deterioration Issues and Their Lessons for Archaeologists. In *Plains Earthlodges: Ethnographic and Archaeological Perspectives*, edited by Donna C. Roper and Elizabeth P. Pauls, pp 111-132. University of Alabama Press, Tuscaloosa.
Root, Matthew J.	2007	A Folsom Ultrathin Biface from Deepwater Creek, McLean County, North Dakota. *North Dakota Archaeological Association Newsletter* 23(3):1-5.
Root, Matthew J., Edward J. Knell, and Jeb Taylor		Cody Complex Land Use in Western North Dakota and Southern Saskatchewan. In *Paleoindian Lifeways of the Cody Complex* edited by Edward J. Knell and Mark P. Muniz, pp. 121-143.
Root, Matthew J., Jerry D. William, Marvin Kay, and Lisa K. Shifrin	1999	Folsom Ultrathin Biface and Radial Break Tools in the Knife River Flint Quarry Area. In *Folsom Lithic Technology: Explorations in Structure and Variation*, edited by Daniel S. Amick, pp. 144-168. Archaeological Series 12. International Monographs in Prehistory, Ann Arbor, Michigan.
Schneider, Fred E., and W. Jeffrey Kinney	1978	Evans: A Multi-component Site in Northwestern North Dakota. *Archaeology in Montana* 19(1 and 2):1-39.
Smith, Carlyle S.	1954	Cartridges and Bullets from Fort Stevenson, North Dakota. *Plains Anthropologist* 1(1):25-29.
Smith, Carlyle S.	1955	An Analysis of the Firearms and Related Specimens from Like-A-Fishhook Village and Fort Berthold I. *Plains Anthropologist* 2(4):3-12.
Smith, G. Hubert	1972	*Like-A-Fishhook Village and Fort Berthold, Garrison Reservoir, North Dakota*. National Park Service, Anthropological Papers.
Smith, G. Hubert	1980	*The Explorations of the La Verendryes in the Northern Plains, 1738-43*. Edited by W. Raymond Wood. University of Nebraska Press, Lincoln.
Stewart, Frank H.	1974	Mandan and Hidatsa Villages in the Eighteenth and Nineteenth Centuries. *Plains Anthropologist* 19(66):287-302.
Stewart, Frank H.	1975	Corrections to Mandan and Hidatsa Villages in the Eighteenth and

Author(s)	Year	Reference
		Nineteenth Centuries. *Plains Anthropologist* 19(66):287-302.
Stewart, Frank H.	1976	Hidatsa Origin Traditions Reported by Lewis and Clark. *Plains Anthropologist* 21(72):89-92.
Stewart, Frank H.	2001	Hidatsa. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
Stewart, Rick, Joseph D. Ketner II, and Angela L. Miller	1991	*Carl Wimar: Chronicler of the Missouri River Frontier.* Distributed by Harry N. Abrams, New York.
Steinbrueck, E.R.	1904	Mandan Village Sites. In *Mandan Memoirs of Explorations in the Basin of Mississippi*, by J.F. Brower. McGill-Warner, St. Paul, Minnesota.
Steinbrueck, E.R.	1906	The Manufacture of Horn Implements of the Mandan. *Collections of the State Historical Society of North Dakota* Vol 1:456-459.
Steinbrueck, E.R.	1910	North Dakota Indians and Their Pottery. *Archaeological Bulletin* 1(3):80-84.
Steinbrueck, E.R.	1911	Implements of Bone. *Archaeological Bulletin* 2(3):65-66.
Steinbrueck, E.R.	1912	Indian Fireplaces and Pots. *Archaeological Bulletin* 3(1):22-23.
Steinke, Christopher	2014	"Her Is My Country": Too Ne's Map of Lewis and Clark and the Great Plains. *William and Mary Quarterly, 3rd Series*, 71(4):589-611.
Strong, William Duncan	1972	From History to Prehistory in the Northeastern Great Plains. *Plains Anthropologist* 17(57):353-394.
Sunder, John E.	1965	*The Fur Trade on the Upper Missouri 1840-1865*. University of Oklahoma Press, Norman.
Taylor, John F.	1979	Tenting on the Plains: Archaeological Inferences about the Awatixa Hidatsa-Mountain Crow Schism from the Missouri River Trench. *Archeology in Montana* 20(3):31-41.
Taylor, John F.	1989	Counting: The Utility of Historic Population Estimates in the Northwestern Plains, 1800-1880. Plains *Anthropologist* Memoir 23(34) 124:17-30.
Taylor, Joseph Henry	1930	Fort Berthold Agency in 1869. *North Dakota Historical Quarterly* 4(4):220-226.
Thiessen, Thomas D.	1993	Early Explorations and the Fur Trade at Knife River. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part II: Ethnohistorical Studies.* National Park Service, Midwest Archeological Center, Lincoln.
Thiessen, Thomas D.	1993	Historic Trading Posts Near the Mouth of the Knife River. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part II: Ethnohistorical Studies.* National Park Service, Midwest Archeological Center, Lincoln.
Thiessen, Thomas D. (editor)	1993	*The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part 1: Objectives, Methods, and Summaries of Baseline Studies*. National Park Service, Midwest Archeological Center, Lincoln.
Thiessen, Thomas D.	1994	The National Park Service and the Interagency Archeological Salvage Program in the Missouri River Mainstem Reservoirs. *Journal of the North Dakota Archaeological Association* 5:15-26.
Thiessen, Thomas D.	1999	*Emergency Archeology in the Missouri River Basin: The Role of the Missouri Basin Project and the Midwest Archeological Center in the Interagency Archeological Salvage Program, 1946-1975*. Midwest Archeological Center Special Report No. 2. Lincoln, Nebraska.
Thiessen, Thomas D., and Karin M. Roberts	2009	The River Basin Surveys Collections: A Legacy for American Archeology. *Plains Anthropologist* 54(210):121-136.
Thiessen, Thomas D., W. Raymond Wood, and A. Wesley Jones	1979	The Sitting Rabbit 1907 Map of the Missouri River in North Dakota. *Plains Anthropologist* 24(84, Pt. 1):145-167.
Thompson, Ralph S.	1984	The Site of the Mandan Indian Village Visited by Verendrye in 1738: A

Author(s)	Year	Reference
		New Look. *North Dakota History: Journal of the Northern Plains* 51(4):22-28.
Thurman, Melburn D.	1984	"Covering the Dead" and Arikara Mortuary Practices. *Plains Anthropologist* 29(103):61-63.
Thurman, Melburn D.	1984	Errata: "Covering the Dead" and Arikara Mortuary Practices. *Plains Anthropologist* 29(10):333.
Trimble, Michael K.	1989	Infectious Disease and the Northern Plains Horticulturalists: A Human Behavioral Model. *Plains Anthropologist* Memoir No. 23 34(124):41-59.
Trimble, Michael K.	1992	The 1832 Inoculation Program on the Missouri River. In *Disease and Demography in the Americas*. Smithsonian Institution, Washington, DC.
Trimble, Michael K.	1993	Infectious Disease and the Northern Plains Horticulturists: A Human-Behavior Model. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part II: Ethnohistorical Studies.* National Park Service, Midwest Archeological Center, Lincoln.
Trimble, Michael K.	1994	The 1837 – 1838 Smallpox Epidemic on the Upper Missouri. In *Skeletal Biology in the Great Plains: Migration, Warfare, Health and Subsistence*, edited by Douglas W. Owsley and Richard L. Jantz, pp.81-89. Smithsonian Institution, Washington, DC.
Truteau, Jean-Baptiste (edited by Raymond J. DeMallie, Douglas R. Parks, and Robert Vezina)	2017	*A Fur Trader on the Upper Missouri: The Journal and Description of Jean Baptiste Truteau, 1794-1796*. University of Nebraska Press, Lincoln in cooperation with the American Indian Studies Research Institute, Indiana, University, Bloomington.
Ubeleaker, Douglas H., and Waldo R. Wedel	1975	Bird Bones, Burials, and Bundles in Plains Archaeology. *American Antiquity* 40(4):444-452.
Ubelaker, Douglas H. and P. Willey	1978	Complexity in Arikara Mortuary Practice. *Plains Anthropologist* 23(79):69-74.
VanNest, Julieann	1985	Patination in Knife River Flint Artifacts. *Plains Anthropologist* 30(110, Pt. 1):325-339.
Voget, Fred W.	2001	Crow. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
Walster, H.L.	1956	George Francis Will 1884-1955, Archaeologist, Anthropologist, Ethnologist, Naturalist, Nurseryman, Seedman, Historian: A Biography. *North Dakota History* 23(1):4-25.
Wedel, W. R.	1969	Washington Matthews: His Contribution to Plains Anthropology. *Plains Anthropologist* 14(45).
Weitzner, Bella	1979	*Notes on the Hidatsa Indians Based on Data Recorded by the Late Gilbert Wilson*. Anthropological Papers of the American Museum of Natural History 56(2):181-322.
Weston, Timothy	1986	Acculturation in the Upper Middle Missouri Valley as Reflected in Modified Bone Assemblages. PhD dissertation, Department of Anthropology, University of Kansas, Lawrence.
Weston, Timothy, and Stanley A. Ahler	1993	Modified Bone and Antler Remains from the KNRI and the Upper Knife-Heart Region. *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part III: Analysis of the Physical Remains.* National Park Service, Midwest Archeological Center, Lincoln.
Weston, Timothy	1993	Acculturation in the Middle Missouri Valley as Reflected in Modified Bone Assemblages. *Plains Anthropologist* 38(142):79-100.
Wetzel, David N.	2019	Missing Links: Ledger book Structure and Two War Books of the 1860s. *Plains Anthropologist* 64(240):185-206.
Will, George F.	1924	*Archaeology of the Missouri Valley*. Anthropological Papers 22, Pt. 6:285-344. American Museum of Natural History, New York.
Will, George F.	1930	Arikara Ceremonials. *North Dakota Historical Quarterly* 4(4):247-265.
Will, George F.	1946	*Tree Ring Studies in North Dakota*. Bulletin 338. Agricultural Experiment

Author(s)	Year	Reference
		Station, North Dakota Agricultural College, Fargo.
Will, George, and Thad C. Hecker	1944	The Upper Missouri River Valley Aboriginal Culture in North Dakota. *North Dakota Historical Quarterly*, 11(1-2).
Will, George F., and George E. Hyde	1964[1917]	*Corn Among the Indians of the Upper Missouri*. University of Nebraska Press, Lincoln.
Williams, John A.	1994	Disease Profiles of Archaic and Woodland Populations in the Northern Plains. In *Skeletal Biology in the Great Plains: Migration, Warfare, Health and Subsistence*, edited by Douglas W. Owsley and Richard L. Jantz, pp.91-108. Smithsonian Institution, Washington, DC.
Wilson, Gilbert L.	1917	*Agriculture of the Hidatsa Indians, An Indian Interpretation*. Studies in the Social Sciences No. 9. University of Minnesota, Minneapolis.
Wilson, Gilbert L.	1924	*The Horse and the Dog in Hidatsa Culture.* Anthropological Papers 15(2):125-311. American Museum of Natural History, New York.
Wilson, Gilbert L.	1928	*Hidatsa Eagle Trapping.* Anthropological Papers Vol. 30, Pt. 4. American Museum of Natural History, New York.
Wilson, Gilbert	1934	*The Hidatsa Earthlodge*. Arranged and edited by Bella Weitzner. Anthropological Papers Vol. 33, Pt. 5 American Museum of Natural History, New York.
Witte, Stephen S., and Marsha V. Gallagher	2012	*The North American Journals of Prince Maximilian of Wied, Volume III: September 1833-August 1834*. University of Oklahoma, Norman.
Winham, R. Peter, W. Raymond Wood, and L. Adrien Hannus	1994	*Village Sites of the Middle Missouri Subarea A.D. 100-A.D. 1887: With a Focus on the Antecedents, Development, Spread, Influences, Achievements, Climax and Decline of the Mandan, Hidatsa and Arikara Cultures in North and South Dakota.* National Historic Landmark Theme Study, Archeology Laboratory, Augustana College, Sioux Falls, South Dakota.
Wishart, David J.	1979	*The Fur Trade of the American West 1807-1840.* University of Nebraska Press, Lincoln.
Wood, W. Raymond	1965	The Middle Missouri Tradition: The Late Stage. *Plains Anthropologist* 10(30):250-255.
Wood, W. Raymond	1969	The Middle Missouri Region: Typology and Concepts. *Plains Anthropologist* 14(44):144-148.
Wood, W. Raymond (editor)	1977	Trends in Middle Missouri Prehistory: A Festschrift Honoring the Contributions of Donald J. Lehmer. *Plains Anthropologist* Memoir No. 3 22(78):1-185.
Wood, W. Raymond	1977	David Thompson at the Mandan-Hidatsa Villages,1797-1798: The Original Journals. *Ethnohistory* 24(4):329-342.
Wood, W. Raymond	1980	Plains Trade in Prehistoric and Protohistoric Intertribal Relations. In *Anthropology on the Great Plains*, edited by W. Raymond Wood and Margot Liberty, pp. 98-109. University of Nebraska Press, Lincoln.
Wood, W. Raymond	1980 [1986]	*The Origins of the Hidatsa Indians: A Review of Ethnohistorical and Traditional Data*. J & L Reprints, Lincoln, Nebraska.
Wood, W. Raymond	1986	*Papers in Northern Plains Prehistory and Ethnohistory: Ice Glider 32OL110*. Special Publication of the South Dakota Archaeological Society, No. 10.
Wood, W. Raymond	1993	The Ethnohistory Research Program for the Knife River Indian Villages National Historic Site. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part II: Ethnohistorical Studies.* National Park Service, Midwest Archeological Center, Lincoln.
Wood, W. Raymond	1993	Hidatsa Origins and Relationships. In *The Phase I Archeological Research Program for the Knife River Indian Villages National Historic Site Part II: Ethnohistorical Studies.* National Park Service, Midwest Archeological Center, Lincoln.
Wood, W. Raymond	1994	An Introduction to the History of the Fur Trade on the Northern Plains.

Author(s)	Year	Reference
		North Dakota History: Journal of the Northern Plains 61(3)2-6.
Wood, W. Raymond	1996	The Missouri River Basin on the 1795 Soulard Map: A Cartographic Landmark. *Great Plains Quarterly* 16(3):183-198.
Wood, W. Raymond	2001	An Atlas of Early Maps of the American Midwest: Part II. *Scientific Papers* 29. Illinois State Museum, Springfield.
Wood, W. Raymond	2003	*Prologue to Lewis and Clark: The Mackay and Evans Expedition.* University of Oklahoma Press, Norman.
Wood, W. Raymond	2006	The North Dakota Artwork of General Regis de Trobriand. *North Dakota History: Journal of the Northern Plains* 73(3 and 4):2-30.
Wood, W. Raymond	2010	The Earliest Map of the Mandan Heartland: Notes on the Jarvis and Mackay 1791 Map. *Plains Anthropologist* 55(216):255-276.
Wood, W. Raymond	2011	James Kipp: Upper Missouri River Fur Trader and Missouri Farmer. *North Dakota History: Journal of the Northern Plains* 77(1 and 2):2-35.
Wood, W. Raymond, and Alan S. Downer	1977	Notes on the Crow-Hidatsa Schism. *Plains Anthropologist* Memoir No. 13:83-100.
Wood, W. Raymond, and J.J. Hoffman	1994	Reminiscences of Two Missouri Basin Shovel Bums. *Journal of the North Dakota Archaeological Association* 5:221-229.
Wood, W. Raymond, Joseph C. Porter, and David C. Hunt	2002	*Karl Bodmer's Studio Art: The Newberry Library Bodmer Collection.* University of Illinois Press, Urbana.
Wood, W. Raymond, William J. Hunt Jr., and Randy H. Williams	2011	*Fort Clark and Its Indian Neighbors: A Trading Post on the Upper Missouri*. University of Oklahoma Press, Norman.
Wood, W. Raymond, and Lee Irwin	2001	Mandan. In *Handbook of North American Indians,* Vol. 13, edited by Raymond J. DeMallie. Smithsonian Institution, Washington, DC.
Wood, W. Raymond, and Ann Johnson	1973	High Butte, 32ME13: A Missouri Valley Woodland-Besant Site. *Archaeology in Montana* 14(3):35-83.
Wood, W. Raymond, and Gary E. Moulton	1981	Prince Maximilian and New Maps of the Missouri and Yellowstone Rivers by William Clark. *Western Historical Quarterly* 12(4):372-386.
Wood, W. Raymond, Robert K. Nickel, and David E Griffin		*Remote Sensing the American Great Plains*. Vol. 29. J & L Reprints, Lincoln, Nebraska.
Wood, W. Raymond, and T. D. Thiessen	1985	*Early Fur Trade on the Northern Plains.* University of Oklahoma Press, Norman.
Woolworth, Alan	1956	Archeological Investigations at Site 32ME59 (Grandmother's Lodge). *North Dakota History: Journal of the Northern Plains* 23(2):70-102.
Woolworth, Alan	1988	New Light on Fort Mandan: A Wintering Post of the Lewis and Clark Expedition to the Pacific, 1804-1806. *North Dakota History Journal of the Northern Plains* 55(3):3-13.
Woolworth, Alan, and W. Raymond Wood	1960	*The Archeology of a Small Trading Post (Kipp's Post, 32MN1) in the Garrison Reservoir, North Dakota*. River Basin Surveys Papers, No. 20. Bureau of American Ethnology Bulletin 176:239-305.
Yellow Bird, Loren	2016	Cultural Encounters Along the Missouri River: Nineteenth Century Euroamerican Portrayals of the Arikara and Contemporary Sahnish Responses. *Plains Anthropologist* 61(240):383-393.

Paleo-Indian Period

The upper Missouri River area was used by the earliest people to come to present-day North Dakota. Many Paleo projectile point finds in the state have been at places near the river. Remains of terminal Pleistocene-early Holocene megafauna are found scattered throughout this SU. The Beacon Island site with its *Bison antiquus* skeletal remains and associated Agate Basin component (Ahler 2003c) indicates this property type is indeed represented in the SU. More components of this sort should be anticipated.

Paleoenvironmental Modeling

Due to the great amount of erosion and deposition that has taken place across the landscape since Paleo times it has proven challenging to locate intact components in this SU, as elsewhere in the state. Paleoenvironmental modeling and Paleo archaeology are intimately related research topics. Ancient cultural deposits hold a wealth of information concerning environmental conditions at the time of the occupation(s). But just as significantly, it is important to know something about the effects of environmental conditions after the time of ancient occupation to gain insights into where deposits of similar antiquity might be found. Based on the discovery of Clovis, Folsom, and later Paleo artifacts at the Moe site (32MN101) (Schneider 1975) and Beacon Island (32MN234) (Ahler 2003; Mitchell 2012) it is known that such ancient deposits can be anticipated above today's reservoir water level on some landforms within the Missouri valley. They can also be expected outside the valley, especially in areas which were once peripheral to playa lakes such as at Max (32ML1350) (Root et al. 2012) that are now dried up. Along the shoreline of Lake Sakakawea, properties such as the Moe site which have lain undisturbed for thousands of years have been lost to shoreline erosion (cf. Reid et al. 1988). The annual rate of bank recession ranges from 0-4.4 m per year and averages about 1.6 m (ibid.:187).

The occupation at Beacon Island (32MN234) occurred early in a period of relative landscape stability marked by a well-developed paleosol, known regionally as the Leonard, that formed during the Younger-Dryas stadial (Mitchell 2012).

There is a glaring absence of models that are useful for predicting Paleo site locations and the kinds of erosional settings along Lake Sakakawea where such exposures can be expected. How did the rate of flow of the Missouri River vary through the Paleo period, and could torrential meltwater flow have inhibited people from crossing the river?

Cultural Chronology

There is not yet any basis for putting forth a Paleo chronology for the GSU 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 Paleo points in the Missouri River Valley in the New Town area (Ahler et al. 2002:69-112). Goshen and Folsom points were recovered from site 32DU396 (Graham et al. 1998). Although intact Paleo deposits do

not remain at the Moe site (32MN101) Clovis, Folsom, and later Paleo components are known to have been present prior to erosion (Schneider 1975).

The Beacon Island site (32MN234) has an Agate Basin-age bison kill-butchery locality that was scientifically excavated (Ahler 2003; Mitchell 2012). The excavated remains represent a single, short-term occupation that occurred during early-to-mid winter. The bonebed is precisely dated based on four radiocarbon assays, two on bone and two on charcoal. A Goshen point was recovered in the deposits and may denote interaction between contemporaneous, but culturally distinct, Paleoindian groups (Mitchell 2012).

At the Max site (32ML1350) Eden, Scottsbluff, and Alberta points have been recovered. At least twenty of the points have impact fractures indicating a kill or butchery location (Root, Knell, and Taylor 2012:134-136).

Middle-era complexes such as Agate Basin and Cody seem to be best represented (Table 6.3). Are there differences in the distribution of Paleo complexes from one side of the Missouri River to the other or to the west and east ends of the GSU?

Settlement Behavior

A KRF Clovis point base, with one face "totally patinated" is reported from 32ME946 (Floodman 1988:220). This site covers two hectares on the crest of a high ridge between Beaver Creek to the south and an unnamed tributary to the north (ibid.:108). The same project reported an isolated find of a KRF Agate Basin point with "about 20% patina" on each face. This isolated find location was on the beach along the lower reaches of present-day Lake Sakakawea near an intermittent tributary stream (Floodman 1988:201). This would probably have been an upland, valley rim or valley side slope overlook setting before the lake was there. What was the most favorable setting for residential base settlements in the upper Missouri valley in early Holocene times? Should a distinction between residential bases and field camps be expected for Paleo hunter-gatherers as for later Plains Archaic period peoples?

Native Subsistence Practices

Beacon Island (32MN234) is the first Agate Basin site identified through controlled excavation in North Dakota (Ahler 2003c). The site contains intact, unmixed, and datable remains of *Bison antiquus*.

At the Max site (32ML1350) a Cody complex kill, or butchery location, has been reported (Root et al. 2012).

What subsistence resources were available in the GSU, and how did that availability vary through the 4,000 years of the Paleo period? Dan Aird reported the discovery of mammoth skeletal remains unearthed in building construction in 1988 near Powers Lake at the Burke-Mountrail-county border (Dan Aird, personal communication

to M. Gregg, December 1989). Although the find has not been radiocarbon dated, the shallowly buried context indicates a postglacial, Holocene age. Remnant Pleistocene megafauna should have been present throughout the SU during the early Holocene, at least during the early centuries of the Paleo period. Materials such as gastropods and pollen from early Holocene paleontological sites should be studied to generate information about climate and vegetation.

Technologies

Two lithic technological procedures prominently represented at sites in the GSU are Folsom fluting and blade production (cf. Ahler 2003c; Schneider 1982d:35-36, 1982c). There are better prospects for collecting information concerning these procedures from campsites outside the quarry area than from the quarry sites themselves where debris from advanced stages of toolmaking, if present, is typically mixed with debitage from raw material testing, bifacial reduction, core preparation, and other earlier stage procedures. Was blade core preparation characteristically carried out at the quarries with blade production carried out at residential sites outside the quarries?

Ahler and Geib (2000) provide a well-developed explanation for Folsom point design and adaptation. They recommend the model be "tested and refined through studies of finished point and preform length, artefact proportions and fracture patterns, basal margin treatment, use-wear in archeological specimens and through actualistic studies of experimental point/haft arrangements" (ibid.:817).

The collection of Agate Basin points from Beacon Island (32MN234) and other well-dated sites could provide an in-depth assessment of technological contrasts and similarities in the production, haft technology, and use of Agate Basin versus Folsom points and the culture-historic relationship between these two cultures (Ahler 2003c).

Artifact Styles

The Moe site (32MN101) near New Town has yielded eight Folsom points and Plainview (or Goshen; n=7), Agate Basin (n=7), Parallel-Oblique Flaked (n=1), Scottsbluff (n=1), and "numerous parallel and obliquely-flaked midsections" (Schneider 1982d:17). Winham et al. (1987:Figure 208) illustrate an Agate Basin point fragment from 32DU662. Metcalf et al. (1988:170) illustrate a probable Alberta point surface collected from an isolated find spot near Scorio Creek close to the headwaters of the Little Muddy River basin.

Eden (30), Scottsbluff (12), and Alberta (3) points have been recovered at the Max site (32ML1350) (Root, Knell, Taylor 2013:134-136). Several Agate Basin points were recovered from the Beacon Island site (32MN234) (Ahler 2003; Mitchell 2013). Is there anything about any of the Paleo point styles represented by finds from the GSU which differ from the Northern Plains norms? Stylistic attributes of mid-blade morphology should be identified to enable identification of Paleo point fragments.

Regional Interaction

The most productive areas for the discovery of Paleo artifacts have been in the KRF primary source area and in or near the Missouri River valley (cf. Root et al. 1986:466; Schneider 1982d:37). Knife River flint was a big attraction, sought by people throughout most of the Great Plains. At the Max site (32ML1350) the Paleo points were of Knife River flint (25), with the rest being of porcellanite (14), silicified wood (3), Rainy Buttes (1), TRSS (1) and translucent chert (1) (Root, Knell, Taylor 2013:134-136). Did some of the major travel routes to and from the KRF quarries cut through the GSU? Could such travel routes be reconstructed through analysis, such as GIS, of archaeological sites and isolated finds? Some of the biface fragments from the Moe site near New Town in the Missouri valley are production failures and unfinished pieces (cf. Schneider 1982d:29). This is the sort of material that would be expected in the lithic assemblage at a campsite of people traveling away from the quarries with a supply of Stage 4 bifaces for making points.

A summary of tool stone utilized for Paleo sites should be prepared. Research directed in determining direct acquisition, long-distance transport or down-the-line exchange should be pursued.

Historic Preservation Goals, Priorities, and Strategies

During the summer of 1989, with the level of Lake Sakakawea at an all-time low due to drought, numerous Folsom and other Paleo period points were rumored to have been collected by nonprofessional, unpermitted individuals from sites exposed along the shorelines at the edge of the lake and on islands. These were very significant finds which may never become public knowledge because such collecting is illegal. Some sort of arrangement should be worked out with the US Army Corps of Engineers to document the finds and record the sites. The great number of Paleo point finds from the Garrison Reservoir shoreline which are rumored, combined with those which have been authenticated, clearly indicates that these specimens have eroded from sites within the big valley. Coring should be conducted upslope from these discovery locations to identify the depositional contexts of the previously intact sites. Mitigative and research projects, like those at Beacon Island (32MN234), should be undertaken to salvage significant information prior to site destruction due to erosion and inundation.

Plains Archaic Period

The GSU vies with the Little Missouri River and Knife River SU in having large numbers of tested and dated Plains Archaic components. As elsewhere, however, it is only the post-Altithermal components which are well represented. The deeply stratified sequence at the Mondrian Tree site (32MZ58) provides a reference point for considerations of Middle and Late Plains Archaic cultural developments.

Paleoenvironmental Modeling

Sites in alluvial fan and valley wall footslope contexts along the margins of the Missouri River valley have potential to provide a wealth of information concerning environmental conditions during the Archaic periods. As in similar settings in other parts of the state, Middle and Late Archaic deposits are found in relatively rapidly deposited sedimentary context in comparison with later Middle Woodland, Late Woodland, Plains Village, and Equestrian period components. Times of rapid deposition in such contexts correlate with erosion in the uplands resultant from drought. Studies of gastropod, rodent, and insectivore remains from dated Archaic contexts can provide environmental information for the site locality as well as the region [e.g., at the Mondrian Tree site, 32MZ58 (Brine et al. 1983)]. All intact Archaic deposits should be analyzed for paleoenvironmental data as part of testing and major excavations.

Cultural Chronology

Excavations at the Moe site did not encounter Paleo period artifacts as hoped, but intact Archaic deposit samples yielded radiocarbon dates indicating occupations at ca. 4320 BC or 4045 BC (Schneider 1975:17, 25). Such dates would be reasonable for a Logan Creek/Mummy Cave component, but no diagnostic artifacts were recovered from this excavated sample of dated site matrix.

Excavations at the Boots site (32MZ732) revealed site occupations extending from the Early Plains Archaic through AD 1943. Diagnostic Archaic projectile points include a Duncan point base, an Archaic stemmed dart point, and Pelican Lake point (Floodman et al. 1997:78).

The most extensive battery of Archaic radiocarbon dates from any site in the state is from the Mondrian Tree site (32MZ58) where 24 samples were dated from seven cultural zones spanning the years from ca. 2200-200 BC (Toom and Gregg 1983:Chapter 8). Represented in the Mondrian Tree site (32MZ58) excavations were: (1) a Pelican Lake component with apparent relationships to Sonota/Besant, (2) an undetermined number of unclassified Middle-to-Late Plains Archaic components, and (3) an undetermined number of Middle Archaic components including one assigned to the Duncan complex (ibid.:8.72). Why is it so difficult to classify Late Archaic components in the GSU to the level of a cultural complex?

Settlement Behavior

Plains Archaic artifacts have been identified most often in elevated settings in the GSU (Table 6.2). Some have been identified in terrace and riverbank locations as well, but those sorts of locations near permanent water were surely occupied more often than indicated by the site file data. This reflects the higher sedimentation rates and deeper burial of Archaic sites in the river bottomlands than in uplands. Many stone circle sites in the uplands are probably attributable to the Late Archaic period when settlement appears to have been heavy here, as it was throughout most of the state. A corner-notched dart

point found at 32WI270 indicates occupation at this stone circle site situated 10 miles north of the Missouri River (cf. Metcalf et al. 1988:132). How extensive were the core territories of Late Plains Archaic peoples who used the GSU, and how do the sizes of these territories compare with those of the Early and Middle Archaic periods?

Native Subsistence Practices

The Middle and Late Archaic components at the Mondrian Tree site (32MZ58) yielded bone remains of canids (probably dogs), beaver, pronghorns, deer, elk, and bison (Falk 1983). The Middle/Late Archaic Cultural Zone 4 dated to the 1080-905 BC time range yielded a fragmentary sandstone grinding slab along with a quartzite mano or pestle. Associated with the grinding tools were a circular surface hearth, chipped stone flaking debris, a few chipped stone tools, and charred seeds of goosefoot, marsh elder, knotweed, dogbone, wild rose, wild grape, strawberry, hedge nettle, and mallow. The association of these remains indicates summertime collecting and processing of plant foods (Gregg 1983d:23.32). How much more fruitful is it to study subsistence practices based on remains from buried bottomland sites rather than upland sites?

Technologies

Initial Early Archaic chipped stone technologies should be expected to exhibit vestigial traits from Paleo times. At the Cherokee site in Iowa (Anderson 1980; Shutler et al. 1974), late Paleo and Early Archaic remains were essentially indistinguishable. Frison et al. (1976:55) said the points from the Hawken site near the Black Hills "could be regarded as nothing more than late, local Paleo styles such as Frederick and Lusk with added side notches." A parallel flaked, side-notched point isolated find reported by Metcalf et al. (1988:173) from a location in the BLM's Sand Creek Coal Study Area a few miles west of Williston fits in this mold. Other close similarities between late Paleo and pre-Oxbow Archaic chipped stone technological traits should be anticipated.

About Middle Archaic technologies, stratified sites with several Middle Archaic cultural zones are ideally suited for investigating differences in the chipped stone technologies of the McKean Lanceolate, Duncan, and Hanna complexes as suggested by the statewide chronological model. What differences are there in the lithic technologies represented in McKean Lanceolate, Duncan, and Hanna components, and do these differences support the proposition that this sequence of three complexes represents an evolutionary continuum?

Artifact Styles

There is a range of variation in side-notched dart points with incurvate bases which takes in the Early Archaic Oxbow style (cf. Dyck 1977:72-86) and Late Archaic Yonkee (cf. Bentzen 1962a) and Sandy Creek (cf. Wettlaufer 1955:Plate 10) styles. The outline morphologies of these three point types overlap, and although these three styles have been used as if they are diagnostic, this is not the case based on current type style descriptions. Points such as the one identified as Oxbow from 32DU769 (Winham et al.

1988:471) have provided the basis for identifying Early Archaic components when Late Archaic components may be represented. More rigid and non-overlapping type style definitions need to be formulated for the various diagnostic forms of Archaic side-notched, incurvate base, and chipped stone dart points. These definitions should be formulated based on large samples from contexts with multiple unproblematic radiocarbon dates.

Regional Interaction

At the Boots site (3MZ732) a copper awl, the sole copper artifact documented and dated within the Little Missouri National Grasslands, dates to 770-375 BC (Floodman et al.:119). Moreover, investigators note that "The dated copper awl from the Boots site is a rare occurrence for the region and a valuable contribution to the knowledge of the use and distribution of this rare resource type in western North Dakota" (ibid.). The copper artifact from a Late Archaic deposit at the Boots site contributes additional support to the proposition that inter-regional exchange rates were greatest during the Paleo, Late Archaic, and Plains Village periods.

Groups with Pelican Lake material culture interacted with others who's archaeological remains we identify as Besant/Sonota. These two archaeological cultures were contemporary in North Dakota and other parts of the Northern Plains for several centuries. In fact, Plains Woodland cultures in North Dakota may have evolved from a Pelican Lake cultural base somewhere east of the Missouri River sometime around 500 BC (cf. Reeves 1983:149, 161, 185). After that time, people of the NAPIKWAN "cultural tradition" (Besant/Sonota-Old Women's) were separate from those of the TUNAXA "cultural tradition" (Pelican Lake-Avonlea). Reeves suggests that after the inception of Besant/Sonota, there was little interaction between NAPIKWAN and TUNAXA peoples. However, finds of Pelican Lake points in Besant/Sonota components and Besant Side-Notched and Samantha points in Pelican Lake components evinces some degree of interaction. At what times in prehistory did the boundary between Pelican Lake and Besant/Sonota territories cut through the GSU?

To contribute to our understanding of regional interaction a summary of tool stone from Archaic sites should be compiled for the GSU.

Historic Preservation Goals, Priorities, and Strategies

As with the archaeological records of most other times and places, it would benefit research as well as cultural resource management to know more about the landforms and at what depths components of the Early, Middle, and Late Plains Archaic periods are likely to be found. Secondly, the GSU rivals the Knife River SU in potential to yield information concerning Late Plains Archaic stylistic variation in projectile points. The sample of four straight-based, side-notched flake points from the ca. 1000 BC. Archaic deposit at the Mondrian Tree site (32MZ58) is a case in point (cf. Toom 1983b:10.104). Reeves (1983:50) suggested that there may be nearly 50 "lower order

types" of the Pelican Lake corner-notched style. Many of the makers of these numerous types of points probably traversed the GSU enroute to and from the KRF quarries.

Plains Woodland Period

Besant/Sonota components are very well represented in the GSU. In a Mercer County, Lake Sakakawea shoreline survey, sites of the Middle Plains Woodland period were found in greater numbers than those of any other period. Temporally diagnostic artifacts included Besant side-notched points, ceramics, and possibly one burial mound that was identified (Floodman 1988:314). Late Woodland cultures are represented by Avonlea and Mortlach. Numerous components attributable to the Old Women's complex should be anticipated. Some of the components identified as Late Woodland in the site file database may be Old Women's. If the Old Women's complex evolved from Besant/Sonota in the NAPIKWAN "cultural tradition" as hypothesized by Reeves (1983:45, 185), and Besant/Sonota is prominently represented in the GSU, then the culture into which it evolved should be represented.

Paleoenvironmental Modeling

Environmentally favorable conditions—those fostering the buildup of regional biomass—appear to have peaked twice during Plains Woodland times in the GSU. These favorable mesic times are represented in stratigraphic sequences by two prominent paleosols (cf. Clayton et al. 1976:11). The older paleosol is identified as the upper Thompson paleosol in the Lower Submember of the Riverdale Member of the Oahe Formation (ibid.). It correlates in time with the Sonota/Besant cultural climax of the Middle Woodland period. The more recent paleosol is in the Upper Submember of the Riverdale Member of the Oahe Formation. It correlates in time with the Neo-Atlantic climatic episode and a fluorescence of Plains Village cultures early in the Plains Village period. But this time of favorable climate began during the Late Woodland period. In stratified sequences spanning the Plains Woodland periods, these should be the two most prominent paleosols, and other thinner buried soils should be represented as well. Two questions regarding these paleosols and paleoenvironmental conditions in the GSU are: (1) How accurately can the beginning and ending dates of these episodes of soil development be determined? and (2) Did mesic climatic conditions prevail uniformly over the entire GSU during these periods of soil development?

Cultural Chronology

Small corner-notched dart points such as the one from 32DU132 near the Lake Sakakawea shoreline are stylistically like, and perhaps contemporary with, small corner-notched points from the Early Woodland cultural zone at the Naze site (32SN246) in the James River SU (cf. Gregg 1987d:Figure 8.2c, d). Besant/Sonota Middle Woodland components are relatively common (cf. Artz 1989b:150; Good and Hauff 1977; Lehmer et al. 1978). Late Woodland components attributable to the Avonlea and Mortlach complexes are numerous (cf. Metcalf 1963; Schneider and Kinney 1978). Does the Late

Woodland culture history of the GSU fit the statewide chronological model, or did Woodland lifeways persist in the GSU throughout much of the Plains Village period?

Settlement Behavior

People with Middle Woodland Sonota/Besant material culture had core territories within (or which included) the GSU. This is inferred from the presence of mortuary sites of apparent Sonota/Besant origin such as at the Boeckel-Renner site (32ME799; cf. Artz 1989b) combined with the large number of Sonota/Besant sites indicating a strong presence of the sort that would result from permanent occupation of a territory. Cold season residential bases with remains of lodges should be anticipated in south-facing wooded draw settings. Such settlements surely were numerous in floodplain forest locations as well.

Native Subsistence Practices

Site 32ME947 is a stratified multiple component bison kill and processing location. The lower component in the bone bed, which is exposed in a cutbank, is identified as Middle Woodland, with the later component being Late Plains Woodland attributed to the Old Women's complex (Floodman 1988:320). Continuity in the mere hunting of bison is a fact of Northern Plains prehistory but use of the same kill spot by people with cultural complexes which have been hypothesized to be genetically related in the NAPIKWAN "cultural tradition" suggests the possibility of continuity in specific aspects of subsistence practices. Were there similarities in bison processing practices between Besant/Sonota components and Old Women's components indicative of closer evolutionary relationships than would be expected for unrelated cultures?

Subsistence remains from the Mortlach component at the Evans site (32MN301) include bison, swift fox, dog/coyote, deer, duck, and a charred plum seed (Schneider and Kinney 1978:31). Bison scapula digging tools were recovered, but not any remnants of garden crops. The diversity of subsistence remains, chipped stone artifacts, bone tools, and ceramics from the test excavation suggests some fairly settled type of encampment, perhaps on the order of a field camp. Seasonality data indicated occupation from late summer to early winter (ibid.). What should be expected in the way of subsistence remains at Mortlach sites that were occupied during different seasons of the year?

Technologies

Ceramic technologies were operative in the GSU from at least as early as the Middle Woodland period as represented at sites such as Nightwalker's Butte (32ML39) (Lehmer et al. 1978:125; Wood and Johnson 1973:64). There are potsherd samples from later Woodland excavated contexts at the Evans site (32MN301) (Schneider and Kinney 1978) and the Mondrian Tree site (32MZ58) (Craig Johnson 1983). Such samples have been described with reference to larger collections from surrounding areas. For example, a Late Plains Woodland vessel from the Mondrian Tree site estimated to postdate AD 1200 was appraised by Craig Johnson to share closest affinities with Duck Bay materials

found in southern Manitoba and Initial Middle Missouri ceramics from along the Missouri River in South Dakota (C. Johnson 1983:9.11) How do attributes of Plains Woodland ceramics in the GSU differ from those found in surrounding regions and subareas?

Artifact Styles

Prairie side-notched arrowpoints, a variety of untyped side- and corner-notched forms, and Avonlea arrowpoints were recovered in test excavations at the Evans site (32MN301) from a cultural zone dated to the AD 600–800-time range (Schneider and Kinney 1978:15). This discovery indicates quite a bit of arrowpoint stylistic variation early in the Late Woodland period. What is the meaning of great stylistic variation in a single component deposit, and what does such variation signify with respect to Late Woodland cultural developments in the GSU?

Mortlach ceramics display considerable variability in decorations as well as vessel forms (Johnson 1977b:41-48; Schneider and Kinney 1978; Syms 1977:125, 1980:376). Straight, excurvate, and S-shaped rims are known. Exterior surface treatment is variable: plain, cordmarked, fabric impressed, smoothed over fabric impressed, simple stamped, or check stamped. Decorative techniques include dentate stamping, oblique incising on the lip, cord impression on the lip, tool impressions, cord wrapped rod impressions, punctates, tool gouging, finger impressions, exterior lip notching, and trailing. Do these traits indicate closer ceramic affinities to the Heart River phase and Scattered Village complex than to Blackduck, Sandy Lake, or other contemporary Plains Woodland archaeological cultures?

Regional Interaction

Obsidian of probable Sonota cultural affiliation was recovered from the Boeckel-Renner site (32ME799) high atop the Missouri-Knife divide with its astonishing view northward across the Missouri valley (Artz 1986, 1989b; Gregg et al. 1985). Two pieces of this obsidian were identified with a Meland, Idaho source. This southeastern Idaho source is not as well represented in North Dakota components as north-central Idaho sources (i.e., Camas Creek-Centennial Mountains and northwestern Wyoming Yellowstone Park) (cf. Baugh and Nelson 1988). Besant/Sonota sites along the Missouri River may have been situated directly upon a waterway travel route which was used to transport exotic stones eastward into the Hopewellian Interaction sphere. Were there "transaction sites," "exchange centers," or any other sorts of central communities in Sonota/Besant culture which functioned in Middle Plains Woodland exchange in any way analogous to similar specialized settlements in Midwestern Middle Woodland societies?

To contribute to our understanding of regional interaction a summary of tool stone from Archaic sites should be compiled for the GSU.

Historic Preservation Goals, Priorities, and Strategies

There is probably no North Dakota SU with greater potential for revealing significant correlations between Woodland archaeological complexes and the named (and yet-to-be named) sedimentary strata of the Oahe Formation. As these associations are worked out, it may become possible to identify archaeological deposits as dating to one of the three Woodland periods merely by properly determining its chronostratigraphic context. Working toward this goal will have the additional benefit of revealing more about places across the landscape which should be considered to possibly hold archaeological deposits of Woodland period antiquity.

Another priority in the GSU is to refine the chronology of Woodland cultural complexes represented in the archaeological record. Specifically, what Late Woodland complexes are represented which might have provided a material cultural milieu out of which Village cultures might have evolved?

Plains Village Period

Prior to ca. AD 1780 when the villages in the southern half of the Knife-Heart region were abandoned, the GSU was mainly an area of hunting camps and other temporary settlements with few permanent settlements (Lehmer 1971:39). Thereafter, the region became a refuge for the Villagers (ibid.).

Site 32DU1 is in the Little Missouri Study Unit but is included here because of its close connection to 32DU2 and 32ML39. Many enrolled members of MHA provided information and access to land during the River Basin Survey in the GSU including but not limited to Mark Mahto, Joe Eagle, Frank Young Bear, Hans Walker, Ben and Robert Good Bird, Pete Starr, George Young Bird, Donald Goodbird, Earl Bateman, Clarence Perkins, and Ralph Wells. In the 1980s additional information regarding the three Duskwalker sites was provided by Tex Lone Bear, William Bell Sr., Cliff Mossett, and Helen Wilkinson. For additional information regarding the Duskwalker sites see Lippincott (2007:259-269).

Paleoenvironmental Modeling

Two paleosols in the Upper Submember of the Riverdale Member of the Oahe Formation date to early and late Plains Village times (cf. Clayton et al. 1976:11). Between these two paleosols and dating sometime within the middle of the Plains Village period, there is often a zone of undeveloped sediments representing a droughty era. This droughty period may correlate with a time in the prehistory of the Middle Missouri subarea during which the subsistence resource base was diminished, and conflicts broke out between neighboring groups (cf. Lehmer 1971:105). How did paleoclimatic conditions affect human land use during the Plains Village period in the GSU?

Table 6.10: Recorded Village Sites and Site Leads within the GSU, 31 December 2020.

Site Number	Site Name	Second Site Name	Affiliation
32DU1	Nightwalker's Butte in the Badlands		Hidatsa
32DU2	Midipadi Butte	Highway 8	Hidatsa
32DU6			Mandan-Hidatsa
32DU20			
32DU21			Mandan-Hidatsa
32ME15	Rock Village		Hidatsa
32ME16	Yellow Knife Village	Star Village	Arikara
32ME17			Arikara
32ME36			Mandan-Hidatsa
32ME37			
32MEX105			
32MEX372			
32ML2	Like-A-Fishhook Village	Fort Berthold	Mandan, Hidatsa, and Arikara
32ML27			
32ML35			Hidatsa
32ML36			
32ML38	Heart Village		Arikara
32ML39	Nightwalkers First Village	Nightwalker's Butte in the Bull Pasture	Hidatsa
32MLX257			Hidatsa
32MLX258			Hidatsa (?)
32MLX260	Assiniboine Camp		Assiniboine
32MLX281			
32MLX303			Hidatsa
32MZ1	Crow Flies High		Hidatsa

Cultural Chronology

The chronology of Plains Village archaeological cultures in the GSU is often drawn directly from the well-grounded culture-historical framework developed for the upper Knife-Heart region (cf. Lovick and Ahler 1982 and expanded on by Ahler [1993]).

Within North Dakota lie portions or all the Cannonball, Knife-Heart, and Garrison archaeological regions of the Middle Missouri subarea. The most refined archaeological 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 complexes and 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 archaeological components (ibid.:Figure 25.2 and Table 25.1). See Ahler (1993:64-108) for the discussion of the cultural taxonomy for the Upper Knife-Heart region.

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.

A vessel recovered from the Mondrian Tree site (32MZ58; C. Johnson 1983:9.11) evinces Initial Middle Missouri and Late Woodland influences in vessel form and surface treatment. Grandmother's Lodge (32ME59) is a Clark's Creek phase site and possibly represents either a Northern Mandan or Awatixa ethnic tradition. Are there other villages that date to the early centuries of the Plains Village period in the GSU?

Settlement Behavior

During prehistoric and early protohistoric times, the Villagers with core areas in the Knife-Heart and perhaps Cannonball regions used the territory of the GSU as a secondary area, one which they visited regularly for specific purposes and resources (cf. Syms 1977:5-6). Sites such as White Earth Creek (32MN101) with a fortification ditch, palisade wall with bastions, but lacking earthlodge depressions (cf. Muller 1968), may represent use of this secondary area by Villagers at a time when such use was contested by Woodland people who held it as a core area or who used it regularly as a secondary area. The range of Plains Village settlement types known in this unit needs to be spelled out. Aside from large fortified earthlodge village settlements, what other site types known in the core areas are not represented for prehistoric Plains Village times in this SU?

Intensive site identification work in a restricted locality can result in the documentation of Plains Village components in a variety of settings indicative of varied activities. Such is the case at the Missouri River crossing of the Northern Border pipeline where Plains Village field camps were established in a sheltered tributary stream valley setting at the Mondrian Tree site (32MZ58) and special purpose activities went on in an adjacent open upland rim setting at the Edna Mae site (32MZ369) (Root 1983m). Localities such as this present an opportunity to explicate a range of settlement behavior if not commonplace activities. In Binfordian terms, how many kinds of special purpose "locations" might reasonably be expected to be archaeologically identifiable out afield in the GSU away from the earthlodge village residential bases?

Native Subsistence Practices

The Villagers living along the Missouri River (in the Southern Missouri River SU) who were visited by La Verendrye in AD 1738 grew corn, melons, pumpkins, and beans. In the late 1800s and early 1900s, after the survivors of the epidemics moved northwestward into the realm of the GSU, their crops included corn, beans, squash, sunflowers, and tobacco (Meyer 1977:63; Will and Hyde 1917; Wilson 1917). How were horticultural practices changed by the volatile cultural events spanning late prehistoric, protohistoric, and historic times? What sorts of archaeological contexts must be sampled, and what sorts of recovery techniques must be employed to enable collecting data to answer such questions?

Technologies

Sites that witnessed multiple occupations during this period, and where deposits from the multiple occupations are stratified, have potential to hold information concerning changes in technologies. This was the case at the Mondrian Tree site (32MZ58) where Plains Village remains attributed to the Scattered Village complex were recovered from the two uppermost excavation levels. Several temporal trends were noted in studying the ceramic bodysherd samples (cf. Johnson 1983). Through time, there was an increase in the percentage of sherds with smoothed exterior surfaces and a decrease in simple stamping. Body sherd thickness increased. Are these trends characteristic of middle-to-late Plains Village times throughout the GSU?

Artifact Styles

Ceramic vessel forms and kinds of decoration combine to yield "wares" which, next to radiocarbon dates, provide the most useful material for determining when sites were occupied. For example, at Midipadi Butte (32DU2), all the Plains Village pottery recovered by excavations was attributable to the Knife River phase (AD 1780 to 1845). Knife River ware made up 80%, Transitional S-Rim ware 10%, and Deapolis Collared ware 10% (Kuehn et al. 1982:48). These wares were defined from Knife River phase components in the lower GSU and upper Knife-Heart regions (Lehmer, Wood, and Dill 1978). Do Knife River phase ceramic vessel styles have a more limited distribution within the GSU than earlier Plains Village vessel styles?

Regional Interaction

Exotic nonlocal shell artifacts are often found in Plains Village sites where fine-mesh recovery procedures are employed during excavation. Dentalium and abalone shell decorative objects were found in association with Scattered Village ceramics at the Mondrian Tree site (32MZ58) (Brine et al. 1983). The cultural mechanisms by which Pacific Coast materials such as these were moved into the Northern Plains are discussed by Wood (1972, 1980). However, Pacific Coast shells are less common in prehistoric Plains Village contexts than historic (ibid.:18.7). At Like-a-Fishhook Village (32ML2), the final earthlodge village occupied by the Mandan, Hidatsa, and Arikara from AD 1845-1885, pendants and cut slabs of abalone plus "hundreds of fragments of *Dentalium*" were archaeologically recovered from lodge floors and caches (Smith 1972:72). Were interactions between Plains Village groups and Pacific Coast peoples more intensive during late Plains Village times than during early and middle Plains Village times?

Historic Preservation Goals, Priorities, and Strategies

Most of the Plains Village residential sites in the GSU have been inundated by the waters of Garrison Reservoir. Others along the steep bluffs have been severely eroding. The effects of inundation and erosion on these archaeological deposits are clearly documented. In addition, there is no question that they suffer from pilferage and looting when reservoir levels drop. The community of concerned archaeologists should work with the Mandan-Hidatsa-Arikara Nation and the US Army Corps of Engineers to safeguard these archaeological sites, evaluate for NRHP eligibility, and mitigate damages.

Equestrian/Fur Trade Period

The GSU is better known for Plains Village tradition sites dating to this period than it is for sites of the Equestrian tradition. The Mandan, Hidatsa, and Arikara moved to this area as a refuge from equestrian peoples during this period, and here the Fort Berthold Reservation was established for them in AD 1870 (Meyer 1977:112). The Equestrian tradition is well represented by archaeological sites here, especially in the western portions of the unit in proximity to Fort Union Trading Post National Historic Site and Fort Buford State Historic Site. There is a rich ethnohistoric record for these contexts from explorers, traders, and military men. The ethnographic and oral historic record is plentiful as well (cf. Bowers 1948, 1950, 1965; Wilson 1910, 1916, 1917, 1924, 1928, 1934, 1971).

Paleoenvironmental Modeling

The records of early explorers and trading post journals provide eyewitness accounts of weather conditions which may be studied to reasonably model the climate changes of this period (cf. Ball 1984). Indians also took advantage of some environmental conditions to further their purposes. There is evidence of recurrent burning across the surface of the Mondrian Tree site (32MZ58) which may have been done

intentionally in the fall of the year to promote a rapid "greening up" in the spring to attract grazing herds of bison to a particular location for hunting (Toom and Gregg 1983).

Cultural Chronology

No complex or phase name has been proposed for any of the Equestrian sites in the GSU. Some protohistoric sites of Villagers and Equestrian peoples predating AD 1780 are, by definition, assigned to the Plains Village period until the GSU chronology is refined. Some of these will be pre-horse and some post-horse. An example may be the Jim Harp site (32WI49), a stone circle site, yielded a tri-notched arrowpoint and a gunflint (Root 1983r).

Settlement Behavior

Site 32WI178, in the BLM's Sand Creek Coal Study Area, lies near Camp Creek, a tributary of the Little Muddy River (Metcalf et al. 1988:10, 115). This location is about nine miles north of the Missouri River. This is a stone circle site with one or more occupations dating to this period, as evidenced by the surface collection of metal arrowpoints. There are 10 stone circles and several dozen cairns which form an alignment across the site. Two aspects of the site which support its assignment to the Equestrian period are the large size of some of the stone circles (up to eight meters in diameter) and the total lack of chipped stone artifacts observed on the surface. Because of the GSU's abundance of stone circle sites and sites with trade goods from exchange activities at the Fort Union and Fort Buford posts, this would be a good SU in which to test the proposition that domestic stone circles with diameters of six meters or greater were typically constructed only by equestrian groups who had horses to haul the long poles required to erect such large lodges.

Native Subsistence Practices

Hidatsa gardening and hunting practices and uses of wild plant resources in the GSU during the 1800s are chronicled in wonderful detail in the works of Alfred Bowers (1965) and Gilbert Wilson (1916, 1917, 1924, 1928). A great deal more has been documented by this ethnographic work than ever will be documented archaeologically for this time and place. However, the challenge for Equestrian period archaeology in the GSU presented by this ethnographic database is to confirm some of these documented practices archaeologically. In this way, the interpretive power of Plains Village archaeology may be improved for application to prehistoric deposits in the GSU. Looking to the adjacent Little Missouri River SU, Walt Allen (1982) used this sort of ethnoarchaeological approach to identify complexes of sites and features which were archaeological representations of ethnographically recorded eagle trapping practices. What sorts of archaeological remains should be expected as indicators of ethnographically recorded subsistence practices of Equestrian period groups in the GSU?

Technologies

The material culture of Knife River phase Plains Village sites is described in detail by Lehmer, Wood, and Dill (1978). Native technologies of both the Villagers and Equestrian peoples were in decline throughout the Equestrian period. Did the Villagers divest themselves of their traditional technologies at approximately the same rates through the Equestrian period?

Artifact Styles

Several different classes of artifacts of both Native and Euro-American manufacture were made following styles which changed during the Equestrian period. Tri-notched arrowpoints which became prominent perhaps as early as the AD 1500s may have persisted into this period (cf. Reher and Frison 1980:25-28). Gunflints of different styles and materials probably changed in availability during the first half of the period. Influxes of different kinds of glass trade beads changed leading to the dating of occupation episodes at sites such as Mondrian Tree (32MZ58). Styles of factory-made iron and brass arrowpoints changed although recovered samples are seldom big enough to enable dating a deposit by study of metal points only (cf. Kuehn et al. 1982, 1984). What stylistic attributes of archaeologically recoverable material culture could possibly be used to identify ethnic or tribal affiliation of Equestrian period components in the GSU?

Regional Interaction

Intertribal trade that took place during the Equestrian period had its inception in prehistoric times (cf. Wood 1972, 1974). The Hidatsa traded with the Crow, Dakota, Cheyenne, and others to the south and southwest (Lehmer et al. 1978:5).

Fur trading directly between Indians and non-Indians within the GSU began by at least AD 1826 when James Kipp of the Columbia Fur Company constructed a trading post in the White Earth Creek valley north of the Missouri River in western Mountrail County (Woolworth and Wood 1960). Fort Kipp was established for trade with the Assiniboine whose territory extended from this Upper Missouri county northward into Canada. Did the increased intensity of intertribal interactions during the Equestrian period result in any loss of tribal identity for groups in the GSU? Is increased uniformity or similarity in assemblages of artifacts any indication of ethnic or tribal uniformity or cultural mixing?

Historic Preservation Goals, Priorities, and Strategies

People of the Mandan-Hidatsa-Arikara Nation (MHAN) now reside on the Fort Berthold Indian Reservation which is entirely within the GSU. During the Equestrian period, these people lived lifeways which combined Plains Village and Equestrian adaptive strategies. The MHAN was approved as a Tribal Historic Preservation Office (THPO) by the National Park Service in 2007. The THPO and the SHSND should continue the close cooperative relationship it has established.