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## The Garrison Study Unit

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2016

The Missouri valley in North Dakota upriver from Garrison dam to the Montana border has witnessed all of 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, may have offered the most reliable resource base in the state for hunting and gathering peoples.

### Description of the Garrison Study Unit

The Garrison Study Unit (GSU) is located 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<sup>2</sup>, 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 (Fenneman 1931; Wyckoff and Kuehn 1983:Figure 4.11).

Topographically, the Coteau Slope is characterized by gently rolling hills dissected by numerous river 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.

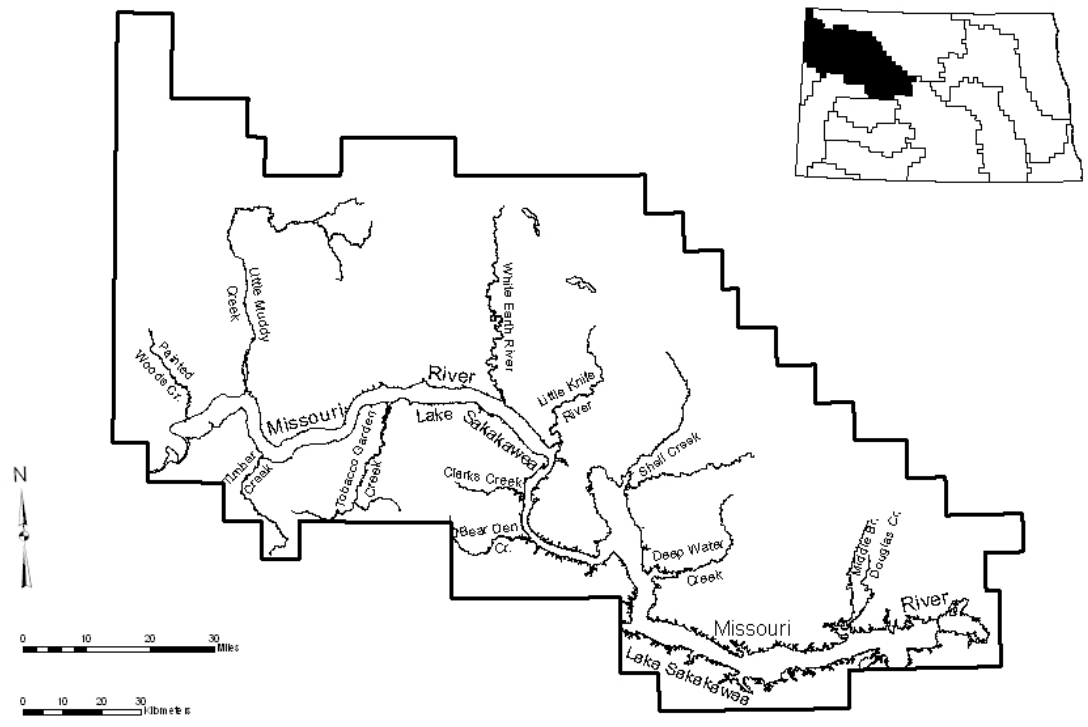


Figure 6.1A: Shaded Relief Map of the Garrison Study Unit.

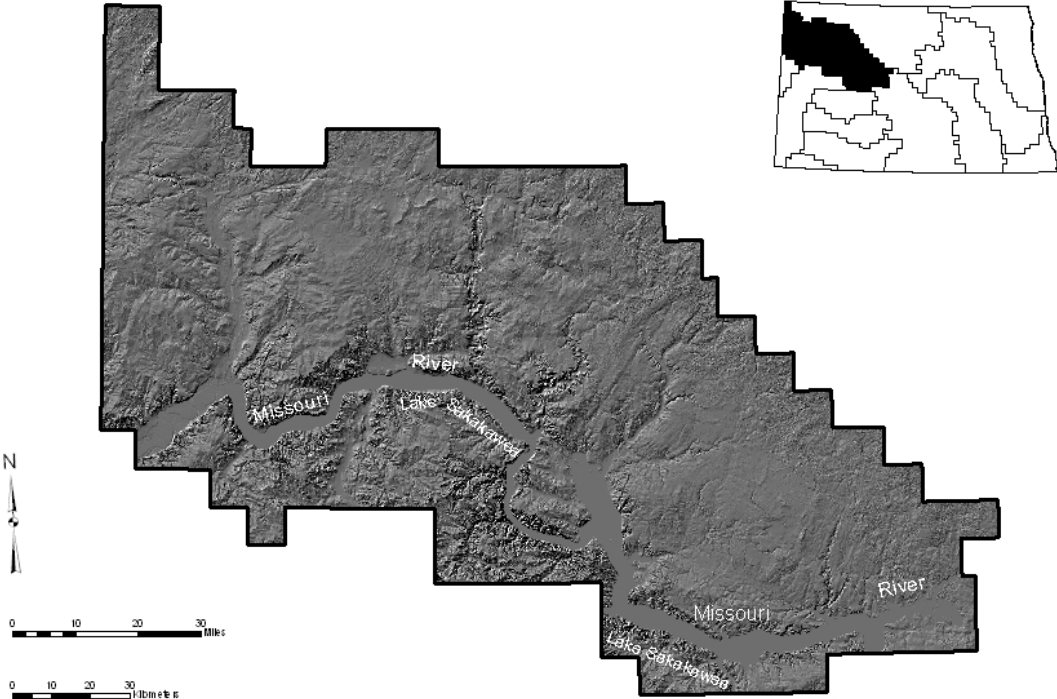


Table 6.1: Townships in the Garrison Study Unit.

TOWNSHIP	RANGE
146	86
146	87
146	88
146	89
146	90
147	82
147	83
147	84
147	85
147	86
147	87
147	88
147	89
147	90
147	91
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150	85
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TOWNSHIP	RANGE
150	87
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151	84
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TOWNSHIP	RANGE
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153	91
153	92
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TOWNSHIP	RANGE
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156	101
156	102
156	103

TOWNSHIP	RANGE
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158	103

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 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 tributary 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. Archeological sites are found on all of these landforms.

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

- Electronic Field Office Technical Guide: <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/fotg/>
- Soil Data Mart: <http://sdmdataaccess.nrcs.usda.gov/>
- Web Soil Survey: <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 in important stone resources at places within the GSU. Depending on the location, there can 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).

#### Overview of Previous Archeological Work

As of 5 August 2015, there were 4,156 archeological sites and 2,504 archeological site leads and isolated finds in the state computerized site data file for this SU. With its area of 8,063 mi<sup>2</sup>, there is one site recorded for every 1.9 mi<sup>2</sup>. The GSU ranks second, after the Knife River SU, out of all of the SU in site density. As of 5 August 2015, 2,698 Class III cultural resource inventories are in manuscript collection at the Archaeology and Historic Preservation Division of the State Historical Society of North Dakota (SHSND). (The total number of inventories was 902 in the 2008 version of the State Plan.)

#### Inventory Projects

Table 6.2 presents the recorded feature types by landform for the GSU. Stone circles, cairns and other rock features account for well over one-half of the site records. The diversity of sites here is as great as in any other SU. 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.

The GSU has a long history of archeological investigation paralleling in many ways that of the Southern Missouri River SU. Among the first reports of archeological reconnaissance was the summary work of Will and Hecker (1944). Based on some 20 years of inquiry, their work provides initial descriptions of prominent earthlodge villages such as Midipadi Butte (32DU2) which were subsequently investigated in greater detail.

Table 6.2: Feature Type by Landform for Archeological Sites in the Garrison Study Unit, 5 August 2015.

	Cairn	Conical	CMS	Eagle	Village	Earth	Fort	Grave	Hearth	Jump	Mound	ORF	Pit	Quarry	Art	Shelter	Circle	Trail	Misc	TOTAL
Alluvial fan	1		4														1			6
Beach/River bank	2		56	1					3			2	1	2			9		1	77
Beachline (glacial)			2												1		2			5
Butte	7		14		1				1			4	5		2		8			42
Canyon			5														3			8
Delta			1																	1
Draw	9		30					1	1	1		5					22		2	71
Floodplain	4		18		2			2	2		1	3	1				12		1	46
Hill/Knoll/Bluff	260		304	7		4		29	20	2	8	160	45	2	6	2	694	4	13	1560
Island			3														1			4
Other	1		8					1			1						6			17
Ridge	375		333	18		2	1	8	25		1	167	60	6	1	1	921	1	12	1932
Saddle	8		13					1	1			6	2	1			32			64
Spur	37		57	1		1		2	4		1	16	4				154	1		278
Swale	1		3														9			13
Terrace	31	1	235	1	10	5		2	40	1	4	19	10	1	1	1	128	3	5	498
Upland Plain	79		113	1			1	6	2	1	4	50	23			1	234	1	10	526
Valley wall foot slope	2		28		5			1	4		1	5	5	2	1		17	2		73
TOTAL	817	1	1227	29	18	12	2	53	103	5	21	437	156	14	12	5	2253	12	44	5221

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

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

A period of some two decades elapsed before the renewal of survey work in the SU. The next mention of inventory work is a brief citation credited to the St. Paul Science Museum (1969).

During the mid-1970s, there was a resurgence of 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 archeological 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). The most important site 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). During 1983, Overland Associates recorded 22 archeological 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<sup>2</sup> 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 6.3 provides a snapshot of these projects.

Table 6.3: Large-scale (1,000+ acres) Class III Inventories Conducted in the Garrison River Study Unit (5 August 2015).

Block Survey	Area (Acres)	Date	# of New Archeological Sites	Manuscript #
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
USACE Lake Sakakawea	15,819	2011	36	13016

The pace of archeological 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. Between 1990 and 5 August 2015 there have been 2,205 inventories conducted within the GSU. Of this total, energy production and transmission projects account for 65%, transportation 18%, land use and water projects 10%, telecommunications 6%, and the remaining 1% are uncategorized projects.

#### Formal Test Excavation Projects

The beginnings of test excavation in the GSU are unclear. The first testing work is that undertaken at the Moe site (32MN101). Schneider (1975) could not find evidence of intact Paleo-Indian (Paleo) cultural deposits at this location where Folsom and other Paleo-age artifacts had been collected from the beach of Lake Sakakawea.

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 groundstone 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.

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 at the Northern Border pipeline in the GSU (Root 1983k, m, p, r, u).

Preliminary cultural resource inventories along the Southwest Water Pipeline project were conducted for the State Water Commission and the Bureau of Reclamation. A number of 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).

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.*).

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. Archeologists suggest that many of the sites recommended as not eligible might be viewed together as contributing elements to a larger district (*ibid.*).

Table 6.4: Formal Testing Projects in the Garrison Study Unit, 5 August 2015.

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	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	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
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

Year	First Author	Second Author	Title	Sites Tested	Ms #
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 399, 32MN445 to 446	4800
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



Year	First Author	Second Author	Title	Sites Tested	Ms #
1991	Lahren, L.		Evensvold: A Prehistoric Stone Circle & Cairn Site in Mountrail Co., ND (32MN448 & 32MN449)	32MN448, 32MN449	5563
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 et al.	Results of Test Excavations at 32ME588, Mercer Co., ND	32ME588	6638
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

Year	First Author	Second Author	Title	Sites Tested	Ms #
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	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 <sub>2</sub> 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 <sub>2</sub> Pipeline Project: Evaluative Testing of Site 32WI305	32WI305	7529
2000	Newberry, G.		Evaluative Testing at Site 32MZ1444 & 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
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
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,	8388

Year	First Author	Second Author	Title	Sites Tested	Ms #
				32MN619, 32MN626, 32WI453	
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
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

Year	First Author	Second Author	Title	Sites Tested	Ms #
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 Inventory in Williams, Mountrail, Ward, McHenry, Pierce Towner, Ramsey, Nelson, and Grand Forks Counties, ND	32WI434 to 435	15789
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

Eleven archeological sites along a proposed pipeline corridor were tested for NRHP eligibility in 1998 (Olson and Newberry 1999). Project archeologists 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 m<sup>2</sup> is present (ibid.:9). The site has been recommended eligible for the NRHP based on its potential to expand archeological knowledge of KRF reduction activities in and out of stone circles. Site 32WI132 also was tested. It is on 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. The majority 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 on 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 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 403m<sup>2</sup> from test units, shovel tests, shove probes, and soil cores (ibid.). Thirty-five prehistoric sites were recommended eligible for listing on the NRHP. Further, archeologists 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. Archeologists 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 on 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 bone comprise the majority of 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).

Twenty-one archeological 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 on 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 located 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.

### Stone Circle and Cairn Sites

Over 2,200 stone circle sites have been identified during surveys (see Table 6.2) in this SU. Table 6.5 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 6.5 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=800+) 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.

Table 6.5: Formally Tested Stone Features in the Garrison Study Unit, 5 August 2015.

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 Radiocarbon dating	Besant Late Prehistoric	

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	Ms#
				Pollen analysis		
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			6395
32ML858	Circle	Inside, outside	Yes			
	Cairn	Inside	Yes			

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	Ms#
32ML860	Circle	Inside	Yes			
32ML861	Circles	Inside, outside	Yes			
32ML862	Circles	Inside, outside	Yes			
32ML863	Circle	Inside	Yes			
32MN105	Circle	Inside	Yes			
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	
32MN147	Circles	Inside	Yes			3316
32MN150	Circle	Inside	Yes	Hearth		
32MN228	Circle	Inside	Yes			4608
32MN398	Circle	Inside	Yes			
32MN399	Cairn	Inside	No			
32MN445	Circles	Inside, outside	No			4800
32MN446	Circles	Inside	No			
32MN448	Cairn	Inside	No			
32MN449	Cairn	Inside	No			5563
32MN460	Circles	Inside	No			14588
32MN508	Cairn	Inside	No			6616
32MN509	Cairn	Inside, outside	Yes			6407
32MN512	Cairn	Inside, outside	Yes			6795
32MN522	Cairn	Inside	Yes			
32MN525	Cairn	Inside	Yes	Radiocarbon dating	Plains Woodland	
32MN533	Circle	Inside	Yes			
32MN534	Cairn	Inside	No			
32MN592	Circle	Inside	Yes			
32MN602	Circle	Inside	No			

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	Ms#
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	10587
32WI132	Circle	Inside, outside	Yes	Radiocarbon dating Hearths	Middle Plains Woodland	7299
32WI309	Circles	Inside	No			4709
32WI346	Circles	Inside	Yes			6792

Site Number	Tested Feature Type	Test Unit Location	Cultural Material	Comments	Cultural/Temporal Affiliation	Ms#
	Cairns	Inside	No			
32WI349	Circles	Inside, outside	Yes	Obsidian Geoarcheology	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			

## 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.

The current list of archeological sites in North Dakota listed in the NRHP is available on the National Park Service website. The following links are useful (NPS 2016a, b):

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

## Major Excavation Projects

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 a number of 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). With the exception of Grandmother's Lodge, a prehistoric Plains Village site, all of 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).

A period of nearly 25 years elapsed before the second round of major excavation commenced in the GSU. 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<sup>3</sup> of site matrix was processed by controlled hand excavation. Since 1991 reports of major excavation projects within the GSU have occurred at a fairly consistent rate (see Table 6.6).

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

Table 6.6: Major Excavation Projects in the Garrison Study Unit, 5 August 2015.

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	Aivazian, B.		Archaeological Excavations at 32MN143, 32MN147, & 32MN150, Mountrail Co., ND	32MN143, 32MN147, 32MN150	3316
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
1996	Christensen, B.		Archaeological Evaluation Site 32MN508	32MN508	6753
1996	Christensen, B.		32WI346 Evaluation Project No. NH-7-002(041)052	32WI346	6792
1998	Graham, C.	L. Cummings et al.	Prehistoric Occupation of the Missouri River Uplands: Excavations at 32DU396 & 32DU1154 Dunn Co., ND	32DU396, 32DU1154	7179
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 <sub>2</sub> Pipeline, Dunn & Mercer Counties, ND	32ME1444	8030



Year	First Author	Second Author	Title	Sites Excavated	Ms #
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
2003	Morrison, J.		Little Beaver Bay Recreation Area: Impact Analysis at 32W115, Williams Co., ND	32W115	8418
2005	Jackson, M.	D. Toom et al.	Site 32MZ1353 Archeological Test Excavations, McKenzie Ranger District, Little Missouri National Grasslands, McKenzie Co., ND	32MZ1353	9467
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

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).

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, graters, 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 archeological 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 on 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 brief summary of the projects follows.

Mitigative measures were undertaken in 1993 in the North Mine Extension Area. Within the GSU, 12 archeological 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 <sup>14</sup>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.

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 archeological 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 21<sup>st</sup> century more of the island was exposed due to low lake levels. Realizing the imminent fate of the site, archeologists 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 archeological 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 archeological 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 and the Mandan-Hidatsa-Arikara Nation at Grandmother's Second Lodge (Reed and Grinnell 2004).

For a synthesis of archeological investigations in the Dakota Prairie Grasslands, professional archeologists, 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 time 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.

Cultural/Temporal Affiliation

Table 6.7: Cultural/Temporal Affiliation of Archeological Resources in the Garrison Study Unit, 5 August 2015.

<b>Paleo-Indian</b>	
Folsom	1
Plano	7
Unspecified	9
<b>Total</b>	<b>17</b>
<b>Archaic</b>	
Early Large Side-Notched	3
Oxbow	8
McKean/Duncan/Hanna	31
Pelican Lake	48
Yonkee	2
Unspecified	54
<b>Total</b>	<b>146</b>
<b>Woodland</b>	
Sonota/Besant	61
Avonlea	8
Early Woodland	2
Middle Woodland	5
Late Woodland	6
Unspecified	3
<b>Total</b>	<b>85</b>
<b>Plains Village</b>	
Northeastern Plains	1
Plains Village	22
<b>Total</b>	<b>23</b>
<b>Plains Nomadic</b>	
<b>Total</b>	<b>20</b>
<b>Late Prehistoric</b>	
Devils Lake/Sourisford	1
Unspecified	144
<b>Total</b>	<b>145</b>
<b>Historic</b>	
Arikara	1
Chippewa	1
Hidatsa	4
Mandan	1
Unspecified	21
<b>Total</b>	<b>28</b>
<b>Unknown</b>	<b>6,296</b>

## Paleo-Indian Period

Surely, the upper Missouri River area was used by the earliest people to come to 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.

## Paleo-Environmental 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. Paleo-environmental modeling and Paleo archeology 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 subsequent to the time of ancient occupation in order to gain insights into where deposits of similar antiquity might be found. Based on the discovery of Folsom and later Paleo artifacts at the Moe site (32MN101) (Schneider 1975), 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 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 are being 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). 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?

## 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*.

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 at a place near Powers Lake near 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. 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. 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 archeological 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.

### 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 in an attempt to identify the depositional contexts of the previously intact sites. Mitigative and research projects, like those at Beacon Island (32MN234), should be undertaken in order 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.

## Paleo-Environmental 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 paleo-environmental 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.

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 is a reflection of 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 fairly 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.

With regard to 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 actually 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

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 whose archeological remains we identify as Besant/Sonota. These two archeological 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?

### Historic Preservation Goals, Priorities, and Strategies

As with the archeological 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 en route 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.

### Paleo-Environmental 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 florescence 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 paleo-environmental 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 similar to, 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 and dominate 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 archeological 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?

### Historic Preservation Goals, Priorities, and Strategies

There is probably no North Dakota SU with greater potential for revealing significant correlations between Woodland archeological 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 archeological 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 archeological deposits of Woodland period antiquity.

Another priority in the GSU is to refine the chronology of Woodland cultural complexes represented in the archeological 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.). Nothing has been discovered to indicate that Lehmer's generalizations on this matter are in need of revision.

Table 6.8: Recorded Village Sites and Site Leads within the GSU, 5 August 2015.

Site Number	Site Name	Second Site Name
32DU2	Midipadi Butte	
32DU6		
32DU20		
32DU21		
32ME15	Rock Village	
32ME16	Yellow Knife Village	Star Village
32ME17		
32ME36		
32ME37		
32MEX105		
32MEX372		
32ML2	Like-A-Fishhook Village	Fort Berthold
32ML27		
32ML35		
32ML36		
32ML38	Heart Village	
32ML39	Nightwalkers First Village	Nightwalker's Butte
32MLX257		
32MLX258		
32MLX260	Assiniboin Camp	
32MLX281		
32MLX303		
32MZ1	Crow Flies High	

### Paleo-Environmental 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 when the land windblown. 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 paleo-climatic conditions affect human land use during the Plains Village period in the GSU?

### Cultural Chronology

The chronology of Plains Village archeological 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). The sequence begins with the Clark's Creek phase (AD 1000-1200) when long rectangular houses were built in unfortified village residential bases and pottery vessels were often made in conformance



with Riggs ware and Fort Yates ware styles. Also dating to this phase are vessels such as one recovered from the Mondrian Tree site (32MZ58; C. Johnson 1983:9.11) which evince Initial Middle Missouri and Late Woodland influences in vessel form and surface treatment. This earliest portion of the Plains Village chronological sequence is not yet represented in the archeology of the GSU by any residential base settlements. Was any part of the GSU permanently occupied by Villagers during the early centuries of the Plains Village period?

### 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 (32MN2) 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 different kinds of special purpose “locations” might reasonably be expected to be archeologically 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 archeological 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 of 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 archeologically 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. While the effects of inundation on these archeological deposits have been debated in the past, investigations during low water levels reveal site destruction due to inundation. In addition, there is no question that they suffer from pilferage and looting when reservoir levels drop. The community of concerned

archeologists should work with the Mandan-Hidatsa-Arikara Nation and the US Army Corps of Engineers to safeguard these archeological sites until they can be properly inventoried and evaluated for NRHP eligibility.

### 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 archeological 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).

### Paleo-Environmental Modeling

The records of early explorers and trading post journals provide eyewitness accounts of weather conditions which can be studied to fairly accurately 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 in order to attract grazing herds of bison to a particular location for hunting (Toom and Gregg 1983).

### Cultural Chronology

Mandan and Hidatsa sites occupied between AD 1780 and 1845 in the Southern Missouri River and Garrison SU are assigned to the Knife River phase (Lehmer et al. 1978:419). No particular complex or phase name has been proposed for any of the Equestrian sites in the GSU. The beginning of the Knife River phase is placed at AD 1780 because that was the time of a smallpox epidemic which slashed the population of Mandan and Hidatsa by over 50% (ibid.:427). This precipitous population drop is thought to have been the reasons for a sudden change in technological and stylistic attributes of Plains Village ceramics (Hollenback 2012). Knife River phase pottery is the product of less adept potters than that of the preceding Heart River phase (ibid.:426).

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). Should there be a special chronology for protohistoric times in the GSU?

## 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 archeologically for this time and place. However, the challenge for Equestrian period archeology in the GSU presented by this ethnographic database is to confirm some of these documented practices archeologically. In this way, the interpretive power of Plains Village archeology 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 ethnoarcheological approach to identify complexes of sites and features which were archeological representations of ethnographically recorded eagle trapping practices. What sorts of archeological 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 are described in great 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

A number of 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 archeologically 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 course of 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.