The Grand River Study Unit

Michael L. Gregg and Amy Bleier
2008

The Grand River Study Unit lies near the southwestern corner of the state along the South Dakota border. The two adjacent "archeological management regions" of the South Dakota State Plan are named "Sandstone Buttes" and "Grand/Moreau Tablelands" (Winham and Hannus 1989:48).

Description of the Grand River Study Unit

There is only a very short reach of the Grand River in North Dakota, and this is actually the North Fork of the Grand River. The North Fork and the South Fork come together just south of Lemmon, South Dakota. The small portion of the North Fork lying within North Dakota is right along the state line south of Bowman. Bowman-Haley Reservoir, inundated to capacity in 1969, lies in the locality of the confluence of Crooked Creek, Alkali Creek, and Spring Creek with the North Fork of the Grand River.

The area of this Study Unit is 864 mi^2 (Figures 8.1 and 8.1A). Drainage is toward the southeast, ultimately to the Missouri River in South Dakota. Parts of Adams and Bowman counties are included. Table 8.1 is a complete list of townships within the Study Unit.

Drainage

The valley of the North Fork of the Grand River is relatively broad and shallow. It averages about 1.5 miles in width with a drop of about 8 ft per mile. The river, meandering down this valley, drops about 4 ft per mile. The main tributaries of the Grand River in North Dakota are Spring Creek, Lightning Creek, Buffalo Creek, and Flat Creek (formerly Hidden Wood Creek). These tributary streams are typically dry most of the year. Buffalo Creek (or Buffalo Spring Creek) is a spring-fed stream with a "reliable water flow" (Artz et al. 1987:6.17). Alluvial deposits in the stream valleys have surely capped and preserved numerous archeological deposits intact. The general lack of permanent water would have prohibited long-term residential settlement through most of prehistory everywhere in this Study Unit except near the North Fork.

In addition to streams, the area may have contained lakes during mesic periods. Bowman Playa between Twin Buttes and Talbot Butte is one example (Artz et al. 1987:6.23). Further, marshy areas such as those along Flat Creek may have been lakes during years of above-average rainfall. When rainfall is adequate, wetlands attract a broad array of creatures including people.

Figure 8.1: Map of the Grand River Study Unit.

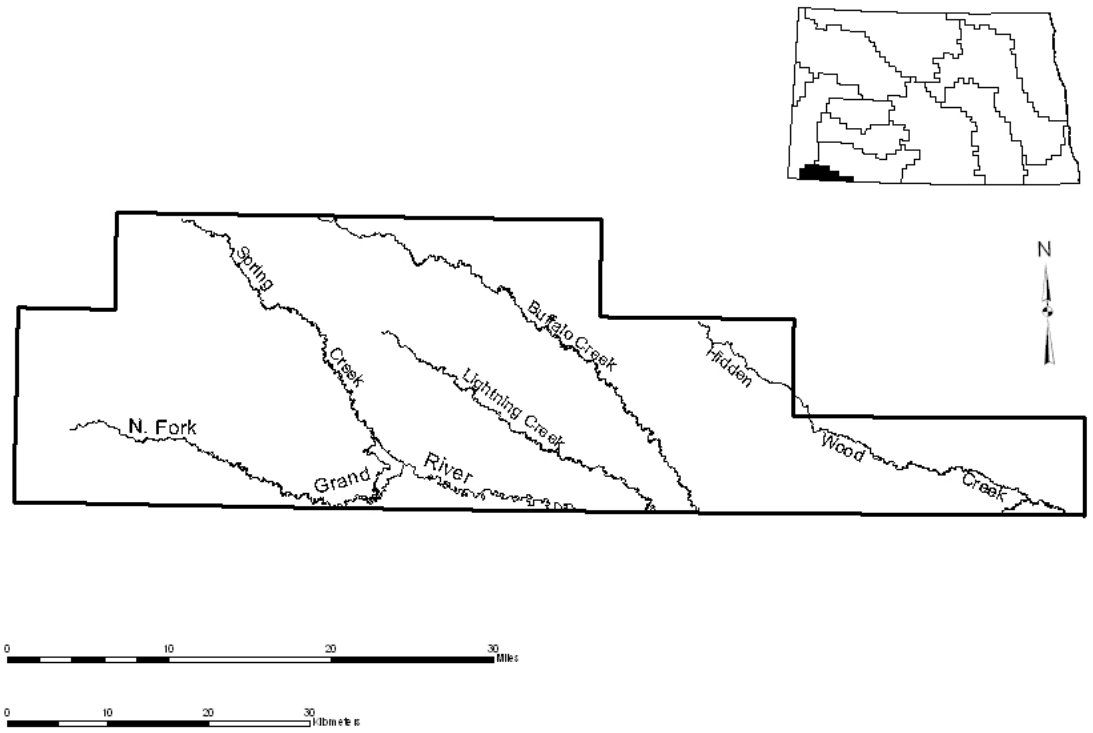

Figure 8.1A: Shaded relief map of the Grand River Study Unit.

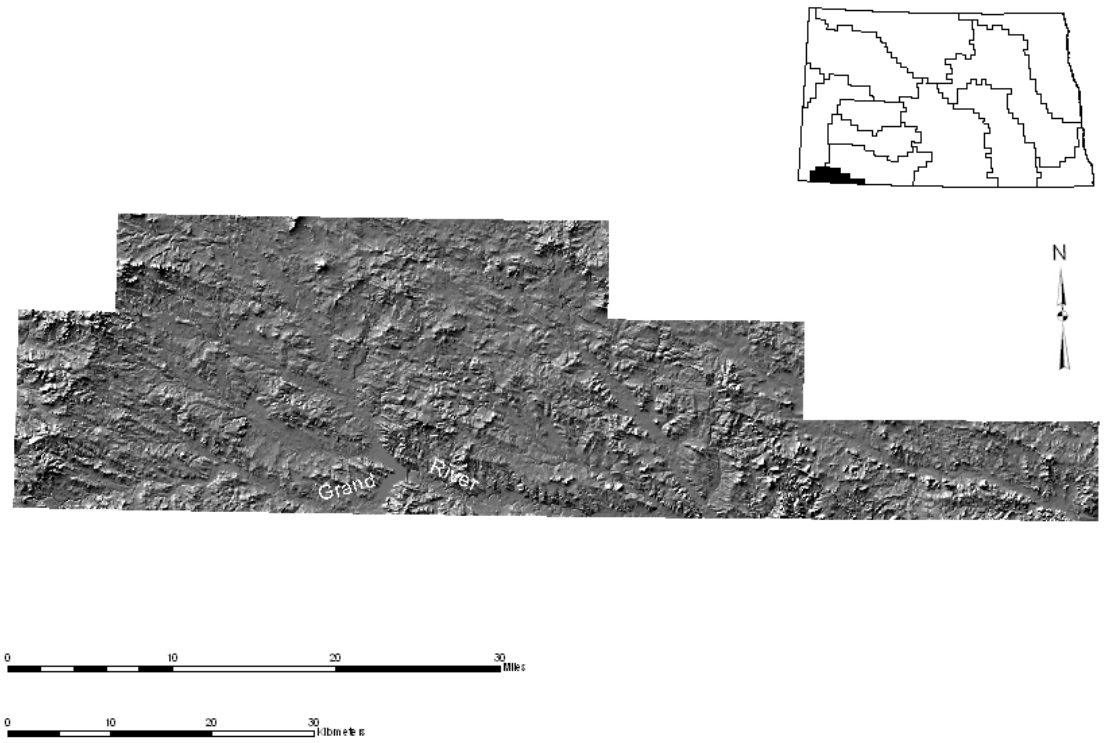

Table 8.1: Townships in the Grand River Study Unit.

TOWNSHIP	RANGE
129	94
129	95
129	96
129	97
129	98
129	99
129	100
129	101
129	102
129	103
129	104
130	97
130	98
130	99
130	100
130	101
130	102
130	103
130	104
131	99
131	100
131	101
131	102
131	103

Physiography

This area may be classified in the Unglaciated Missouri Plateau subsection, of the Missouri Plateau section, of the Great Plains physiographic province (Fenneman 1931; Hunt 1974; Pirkle and Yoho 1977). The South Dakota portion of the basin is described physiographically as "part of the Cretaceous Tablelands Section of the Missouri Plateau Division of the Great Plains" (Winham and Hannus 1989:89).

Beyond the stream valleys, the uplands are a gently rolling to somewhat rugged dissected plateau completely outside the glaciated portion of North Dakota (Murphy et al. 1993). There are scattered buttes and ridges with exposures of sandstone and other bedrocks of the Bullion Creek, Ludlow, Cannonball, and Slope Formations. The southern part of the Medicine Pole Hills lies within the northwestern part of the unit. The Medicine Pole Hills are on the drainage divide between the Grand and Little Missouri rivers. The southwestern portion contains part of the Pommes Blanches Hills. Hunting lookout stations should abound atop the buttes. The northern end of the North Cave Hills also straddles the state line extending into this unit. Named buttes here include Moga Butte, Talbot Butte, Rocky Ridge, and Twin Buttes. Buttes such as these were landmarks which attracted settlement and were used to mark travel routes. Within a few miles to the south in South Dakota are Lodge Butte, Tepee Buttes, and the Eagle's Nest Hills.

Tongue River silicified sediment (TRSS), porcellanite, and many varieties of agatized wood are knappable stones found here. Agatized wood carpets many of the low hills and ridges in the Bowman-Haley Reservoir locality (Hume and Hume 1964). It is necessary to compile specific information about the source areas of various materials and determine if there is any high-grade porcellanite present. Porcellanite is formed by underground lignite burns (Fredlund 1976), and several such burns have been active in Adams County in the mid-1900s. Tongue River silicified sediment may be most abundant along a zone where there are surface exposures of the contact between the Slope and Bullion Creek Formations (cf. Ahler 1977b:117). "Where erosion has removed the Bullion Creek and all or part of the Slope Formation, TRSS often occurs as a dense surface lag deposit of large angular boulders scattered across hill tops and stream terraces" (Keyser 1987:233). The lithic resources of this Study Unit are abundant in comparison to those in the eastern and northern parts of the state.

Climate

For the Grand River National Grasslands, the climate is described as semiarid or subhumid continental. Rainfall averages 16 inches per year, but periodic droughts render this unreliable (Beckes and Keyser 1983:151). The driest time of the year typically is winter. "The soil usually freezes prior to significant saturation and is usually blown bare of snow by high winter winds" (ibid.).

The southwestern part of North Dakota has been somewhat warmer than other parts of the state during the 1900s. Was this generally true throughout all of prehistory? With high temperatures, low precipitation, and the high evapotranspiration rates of the plains, this area has been more susceptible to drought and loss of permanent water sources than any other part of the state. Was there any time during prehistory when occupational intensity here was higher than in other parts of North Dakota?

Landforms and Soils

Ridges, hills, buttes, and other elevated landforms are often the bedrock exposures. Sediments exposed by wind erosion have been redeposited nearby in aeolian depositional contexts. Sediments in such contexts underwent soil development during mesic eras (cf. Clayton et al. 1976). A buried soil of possible Paleo-Indian age was found in proximity to a Scottsbluff dart point at 32AD10 several miles southwest of Rocky Ridge (Artz et al. 1987:6.36). Soils in this Study Unit develop from sediments eroded from Sentinel Butte, Bullion Creek, Slope, and White River Formation parent materials.

Natural Resources Conservation Service (NRCS) official soil survey resources are available on the internet (NRCS 2007a, 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:
http://www.nrcs.usda.gov/technical/efotg/
Soil Data Mart: http://soildatamart.nrcs.usda.gov
Web Soil Survey: http://websoilsurvey.nrcs.usda.gov/app/

Flora and Fauna

Most of this area is grassland. Indian breadroot (*Psoralea esculenta*), a favored food of Native Americans, grows on the prairie here. There are small patches of juneberry (*Amelanchier alnifolia*) and buffaloberry (*Shepherdia argentea*) in protected areas; cottonwood (*Populus deltoides*) occurs near water, and American elm (*Ulmus americana*), box elder (*Acer negundo*), and green ash grow (*Fraxinus pennsylvanica*) in draws.

Mosaic patterns of rainfall typify the Plains. The grasslands required adequate moisture at critical growth periods in order to develop grazing conditions which attracted bison. Increased forage in the region led to increased bison grazing, bigger herds, and heightened potential for communal kills (Allen and Dibenedetto 1988). Effective moisture is the key to good grazing conditions. Information is sorely lacking regarding eras of adequate versus inadequate rainfall during prehistory. Radiocarbon dating of archeological deposits found in paleosols would be a productive first step in identifying general periods of time with greater effective moisture and soil development.

Other Natural Resource Potential

Freshwater springs presented another water source for game animals and people to use. Spring locations can be a clue to archeological site locations here as in other study units. It would be advantageous to know the locations of springs throughout the drainage. All are likely to have attracted settlement at one time or another in the past.

Overview of Previous Archeological Work

The Grand River Study Unit has witnessed relatively little archeological investigation, in part because the area is small (864 mi^2). Another factor has been the scarcity of large federally funded or licensed projects such as reservoir developments and strip mines which destroy large areas of the natural landscape and consider how of historic properties could be affected. A review of reports of the work which has been carried out, show that samples from site inventory work are clearly more substantive overall than samples from excavation.

Inventory Projects

As of 13 September 2007, there were 141 archeological sites and 83 archeological site leads or isolated finds in the state site data file for this Study Unit. With an area of 864 mi^2, there is one recorded site per 6 mi^2. However, no vast tracts of surveyed areas are represented by records in the site data file. As of 5 September 2007, the total area surveyed in the Grand River Study Unit was 53,818.24 acres. The density of archeological sites per acres surveyed is approximately one site per 62.3 acres. More basic inventory work needs to be done.

Table 8.2 summarizes archeological site coding for feature types and landforms. Sites on alluvial landforms (riverbanks, floodplains, and terraces) account for about 30% of the sample. Stone circle and other stone feature sites also make up approximately 30% of the sample revealing a discrepancy between the site file data set and results of a sampling survey of BLM coal study areas where stone feature sites were not represented at all (see below).

The earliest reported archeological investigations in this Study Unit were surveys of the proposed Bowman-Haley Reservoir. The sequence of Bowman-Haley work has been summarized by Tibesar (1982:29). The first was a survey conducted in 1964 (Hume and Hume 1964), and 36 sites were identified. A resurvey was conducted by Oscar Mallory in 1965. This led to two months of excavations at sites 32BO207 and 32BO213 in 1966 directed by Mallory. Post-inundation surveys were conducted by Chris Dill in 1976 and Larry Robson (1981). The excavations yielded important information regarding Middle Archaic period occupations.

Table 8.2: Feature Type by Landform of Archeological Sites in the Grand River Study Unit, 13-Sept-2007.

	Cultural Material Scatter	Hearth	Jump	Other Rock Features	Pit	Quarry or Mine	Rock Shelter	Stone Circle	Misc.	Total
Beach or riverbank	5	2	1							8
Draw	3	1	1					1		6
Upland plain	7			3		1		2		13
Floodplain	7			1			1			9
Hill - Knoll - Bluff	45			9	2			13	2	71
Ridge	10			9				9		28
Saddle								1		1
Spur	2							3		5
Swale	1									1
Terrace	31	2		2	1			1		37
Foot slope	1									1
Other	1									1
Total	113	5	2	24	3	1	1	30	2	181

A survey of five BLM coal study areas (CSAs) in western North Dakota found that about 50% of the sample units in the Bowman-Gascoyne CSA were untilled native prairie (Metcalf et al. 1988:284). The Bowman-Gascoyne CSA straddled parts of three study units: Little Missouri River, Cannonball River, and Grand River. The only sort of prehistoric sites found were lithic scatters and isolated chipped stone artifacts. No stone features sites were encountered.

The Bowman-Gascoyne CSA survey covered just one 160-acre sample unit in the Grand River drainage. Artifacts observed at the single site found in this sample unit were primarily agatized wood flintknapping workshop debris. Part of a sandstone mano was also observed (ibid.:110). Even though the site was undisturbed in an untilled hilltop setting, and without the benefit of controlled surface or subsurface sampling, it was evaluated as ineligible for the NRHP, with no further work recommended. Some cultural resource managers and researchers might see interesting research prospects in the excavation of an intact agatized wood workshop.

Site survey for the Southwest Pipeline encountered archeological properties in two transects within this Study Unit; 24 sites were recorded along ca. 30 miles of right-of-way (Artz et al. 1987:Figure 6.1). Lithic raw material procurement activities were well represented, focused on naturally occurring agatized wood and Knife River flint (KRF). (This is a minor source of KRF.) While these sites were in proximity to reliable water sources, surveyors can expect to find procurement sites representing "short-term activities carried out in forays away from residential base camps far removed from permanent water" (ibid.:6.20).

In October 1995, UNDAR-West worked to locate and re-evaluate cultural resources along a portion of the proposed Southwest Pipeline. Two sites were recorded and 13 sites re-evaluated (Klinner 1996). One site of particular note, 32AD75, consisted of four cairns, four stone circles, and one stone circle with a cairn attached, all well-sodden (ibid.). Additionally, a sparse scatter of debitage was present. The debitage comprised moderately patinated petrified wood flakes and shatter (ibid.). Disturbances to the site are agricultural practices, road and fence construction, and erosion.

Table 8.3 is a list of manuscripts on file at the SHSND along with other published reports dealing with archeological site inventory work in the Grand River Study Unit. Materials in the manuscript collection must have been coded in the manuscript data file as covering part of a township included within the Study Unit in order for them to have been printed out in the listing from which the following was prepared.

Table 8.3: Inventory Projects in the Grand River Study Unit, 5-Sept-2007.

Year	First Author	Second Author	Title	Ms #
1964	Hume, G.	V. Hume	The Bowman-Haley Reservoir Archeological Survey, Bowman Co., ND	4
1975	Dill, C.		Archaeological and Historic Site Survey, South Beulah & Gascoyne Mine Expansion Areas, Knife River Coal Company	119
1976	Dill, C.		1976 Archaeological and Historical Site Survey of NL Industries Incorporated's Gaylord Olson Mine, Adams Co., ND	1
1977	Dill, C.		1976 Archeological & Historical Site Survey of the Bowman-Haley Reservoir Shoreline & Public Use Areas, Bowman Co., ND	3
1977	Schneider, F.		Cultural Resource Inventory of NL Industries Incorporated's Smith-Ullman Mine, Adams Co., ND	1554
1979	Loendorf, L.	A. Simon	Cultural Resource Survey, Miles City-New Underwood 230 kV Line, Adams, Bowman, Slope, & Golden Valley Counties, ND	2227
1981	Schweigert, K.		Report of a Cultural Resources Survey E½ of Section 12, T130N, R99W, Bowman Co., ND	2901
1981	Simon, A.	S. Montgomery	A Class III Intensive Inventory for the Proposed MDU 230 kV Line Reroute in Adams Co., ND	2254
1982	Borchert, J.	A. Simon	A Cultural Resource Survey of Certain Gascoyne Mine Lands, Bowman Co., ND	2469
1982	Borchert, J.		Gascoyne Mine Expansion Survey 1982, Bowman Co., ND	2892
1982	Robson, L.		U.S. Army Corps of Engineers In-House Cultural Resources Survey, Bowman-Haley Reservoir, Bowman Co., ND	2488
1982	Schweigert, K.		A Cultural Resources Investigation of a Previous Coal Mining Area Near Scranton, Bowman Co., ND	2842
1982	Vivian, J.		Historical Evaluation of the Sandstone Workshop Homestead Near Gascoyne, ND (32BO61)	2783
1983	Bass, S.		Bowman Co., Land Status Survey, 84-MT030-10 (A)	3529
1983	Bass, S.		Bowman Co., Land Status Survey, 84-MTO30-10 (B)	3530
1983	Bass, S.		Bowman Co., Land Status Survey, 84-MTO30-10 (C)	3531
1983	Bass, S.		Bowman Co., Land Status Survey, 84-MTO30-10 (D)	3532
1983	Bass, S.		Bowman Co., Land Status Survey, 84-MTO30-10 (E)	3533
1983	Bass, S.		Bowman Co., Land Status Survey, 84-MTO30-10 (F)	3534
1983	Wilson, R.	F. Kirby	An Intensive Archeological Field Inventory of the Hanson AML Project, South of Reeder, Adams Co., ND	2845
1984	Bass, S.		Bowman Co., Land Status Survey, 84-MT030-10 (W)	3527
1984	Bass, S.		Bowman Co., Land Status Survey, 84-MTO30-10 (H)	3536
1984	Bass, S.		Bowman Co., Land Status Survey, 84-MTO-30-10 (X)	3528
1984	Borchert, J.		Cultural Resource Survey SCI Exploration No. 1 Maychrzak Section 14, T129N, R100W, Bowman Co., ND	3578
1984	Kuehn, D.		Class III Intensive Inventory Matador Rhame 6" Crude Oil Pipeline, Bowman Co., ND	3274
1985	Gregg, M.	C. Kordecki et al.	Southwest Pipeline Archeology: Initial Survey of Selected Tracts, Adams, Bowman, Hettinger, Grant, Stark, Billings, Golden Valley, Dunn, & Mercer Counties ND	3554
1987	Artz, J.	C. Haury et al.	Southwest Pipeline Archeology: An Intensive Survey for Cultural Resources in Ten Counties of Southwestern ND, Adams, Bowman, Hettinger, Grant, Stark, Billings, Morton, Golden Valley, Dunn, & Mercer	4247
1987	Smith, G.		1987 Bowman Co., Land Adjustment Survey No. 4	4405
1987	Welch, J.	J. Whitehurst	Class III Cultural Resource Inventory of American Colloid Company Gascoyne Property, Bowman Co., ND	4174
1988	Borchert, J.	D. Kuehn	Bowman Sand & Gravel Test Pits Cultural Resource Inventory Bowman Co., ND	4613

Year	First Author	Second Author	Title	Ms #
1988	Granger, S.	S. Kelly	The Bowman Co., Historic Sites Inventory Project ND Cultural Resources Survey	4668
1988	Metcalf, M.	A. McKibbin et al.	A Class II Cultural Resource Survey of Five Coal Study Areas, Williams, Divide, Hettinger, Slope, Bowman, Grant, & Adams Counties, Western North Dakota	4557
1989	Fox, R.		The Bowman-Ladner Transmission Line: A Class III Cultural Resource Inventory in Bowman and Harding Counties, ND & SD	4743
1990	Burbidge, G.	L. Peterson	Wyoming Resources Corp. USA #1 Well Pad Cultural Resource Inventory Bowman Co., ND	4970
1990	Christensen, R.		Consolidated Telephone Cooperative's South Area Fiber Optic Cable Route in Adams, Hettinger & Stark Counties ND Cultural Resource Damage Assessment	5314
1990	Persinger, R.	K. Pool	Consolidated Telephone Cooperative Dickinson to Bowman Subsurface Line Construction, Bowman Co., Class III Cultural Resource Inventory	5316
1991	Borchert, J.		Project BRO 6(3) Bowman County Bridge Replacement Cultural Resource Inventory	5613
1992	Borchert, J.		Highway 85 Bowman County Borrow Area Cultural Resource Inventory	5722
1992	Johnson, L.	M. Hufstetler et al.	Historic Bridges in North Dakota	5920
1992	Stine, E.		Bowman Co., Gravel Pit A Class III Cultural Resource Inventory T131N R102W Section 7 Bowman Co., ND ND-DOT #NH-5-085(025)017	5805
1993	Lahren, L.	S. Lahren et al.	Cultural Resource Evaluations of the Haynes AML Area, Adams Co., ND	6253
1993	Loendorf Associates		Results of a Class III Cultural Resource Inventory of Selected Bureau of Land Management Parcels, Bowman & Golden Valley Counties, ND, Vols. 1 & 2	6087
1993	Wermers, G.	J. Borchert	Consolidated Telephone Rhame Exchange #1-5 Cable Routes Class II Reconnaissance Inventory Slope & Bowman Counties	6128
1994	Toom, D.		Bridge Replacements, Archeological Sites, & Archeological Site Surveys in ND	6249
1995	Klinner, D.		Meridian Oil, Inc. 22-30H Bog Creek Well Pad & Access Road in Section 30, T131N, R105W, Bowman Co., ND: Results of the Class III Cultural Resources Inventory	6436
1995	Klinner, D.		US Fish & Wildlife Service Small Earthen Dam Projects, Order Number 62110-5-0274: Results of Five Class III Cultural Resources Inventories in Adams, Dunn, & Oliver Counties, ND	6531
1995	Kulevsky, A.		Hettinger Municipal Airport Expansion: A Class III Cultural Resource Inventory in Adams Co., ND	6490
1995	Kulevsky, A.		Meridian's 14-33H Hays Well Pad & Access Road: A Class III Cultural Resource Inventory in Bowman Co., ND	6602
1995	Metcalf, S.		Consolidated Telephone Cooperative's Ladd Exchange: A Cultural Resource Inventory, Bowman Co., ND	6624
1996	Klinner, D.		Southwest Pipeline Phase II Cultural Resources Inventory of the Bucyrus Tank Alignment & Reevaluation of 13 Previously Recorded Sites, Adams Co., ND	6651
1996	Klinner, D.		The Bridge Replacement Project in Sections 27 & 28, T129N, R102W, Bowman Co., ND: Results of a Class III Cultural Resources Inventory	6642
1996	Kulevsky, A.	E. Stine	KLJ-Consolidated Telephone Cooperative Rhame Exchange: A Class II & III Cultural Resource Inventory in Bowman & Slope Counties, ND	6855
1996	Wermers, G.		The Continental Resources, Inc. Rocky #1-18F & Elsie #1-22F Well Pads and Access Roads in Bowman Co., ND: Results of the Class III Cultural Resources Inventories	6842

Year	First Author	Second Author	Title	Ms #
1997	Klinner, D.		Paulson Premium Seed and Conditioning Survey Block in Section 7, T131N, R101W, Bowman Co., ND	7014
1997	Klinner, D.	G. Wermers et al.	Southwest Pipeline Phase II Cultural Resources Investigations in Portions of the Jung Lake, Scranton, & Bucyrus Service Areas, Hettinger, Adams, & Slope Counties, ND (Construction Segments 2-4A and 7-3), Parts I & II	6873
1997	Klinner, D.	G. Wermers	Total Minatome Corporation Hilton #3-31H Well Pad & Access Road in Bowman Co., ND and Harding Co., SD	6999
1997	Porter, D.	D. Klinner	Southwest Pipeline Phase II Cultural Resources Inventory of the Hettinger Reroute in the Bucyrus Service Area, Adams Co., ND	9064
1997	Porter, D.	G. Wermers	Southwest Pipeline Phase II Cultural Resources Inventory of the Reeder Reroute in the Bucyrus Service Area, Adams Co., ND	9063
1998	Isern, T.	L. Isern et al.	Historic Architectural Survey of Bowman Co., ND	8416
1998	Larson, T.		Results of a Class II and Class III Cultural Resource Inventory for NDDOT Project Area NH-5-012(024)074 Adams Co., ND	7239
1998	Larson, T.		Results of a Class II & Class III Cultural Resource Inventory for NDDOT Project Area NH-5-085(036)000 Bowman Co., ND	7310
1998	Larson, T.		Results of a Class II and Class III Cultural Resource Inventory for NDDOT Project Area SNH-5-085(038)017, Bowman Co., ND	7280
1998	Larson, T.		Results of a Class II & Class III Cultural Resource Inventory for NDDOT Project Area SS-5-012(023)020 Bowman Co., ND	7282
1998	Larson, T.	D. Penny et al.	Results of Class I, Class II & Class III Cultural Resource Investigations for the Southwest Pipeline Project: The Bucyrus and Three Pocket Service Areas, Adams, Bowman, Hettinger, Slope, & Stark Co., ND	7137
1999	Klinner, D.		Adams Co., Walkway Project Along the North Shore of Mirror Lake, ND	7384
1999	Wermers, G.		Bridge Replacement (Structure Number: 01-119-22.1) Project in Sections 19 & 20, T129N, R95W, Adams Co., ND	7387
2000	Bluemle, W.		NDDOT Highway 8: A Class III Cultural Resource Inventory, Hettinger & Adams Counties, ND	7652
2000	Wermers, G.		Thirteen NDDOT Living Snow Fence Planting Areas in Adams, Oliver, Burleigh, Barnes, & Cass Co., ND	7646
2001	Bluemle, W.		Kralicek Borrow Area: A Class III Cultural Resource Inventory, Bowman Co., ND	7875
2001	Christensen, B.		Christman 2 Pit (STATEOP-396) Class III Inventory Report, Adams Co., ND	7916
2001	Christensen, B.		Christman Pit (STATEOP-395) Class III Inventory Report, Adams Co., ND	7915
2001	Christensen, B.		Harriet Hilton "3 Borrow" Pit Class III Inventory Report, Bowman Co., ND	7798
2001	Christensen, B.		Paul & Sandy White Pit Class III Inventory Report, Bowman Co., ND	7801
2001	Christensen, B.		STATEOP-370 Borrow Source Class III Inventory Report in Adams Co., ND	7836
2001	Christensen, B.		STATEOP-382 Class III Inventory Report, Adams Co., ND	8025
2001	Christensen, B.		STATEOP-393 Class III Inventory Report, Bowman Co., ND	7986
2001	Christensen, B.		STATEOP-394 Class III Inventory Report, Adams Co., ND	7987
2001	Christensen, B.		STATEOP-397 Class III Inventory Report, Adams Co., ND	8060
2001	Klinner, D.		Class III Investigations of the Twin Buttes Service Area Main Transmission Pipeline (Contract 2-4C) for the Bowman-Scranton Phase W.O. 3033.872 of the Southwest Pipeline Project	7965
2001	Klinner, D.		Extraction Pit Survey for Edward Schwartz Construction, Inc. in Section 14, T129N, R95W, Adams Co., ND	7942
2001	Lawrence IV, M.		North Kralicek Borrow Area: A Class III Cultural Resource Inventory, Bowman Co., ND	8043

Year	First Author	Second Author	Title	Ms #
2001	Morrison, J.		Living Snow Fence Survey of Six Parcels: Adams Co., ND: A Class III Cultural Resource Inventory	7845
2001	Morrison, J.		Oase Gravel Pit: A Class III Cultural Resource Inventory, Adams Co., ND	7819
2001	Wermers, G.		Class III Cultural Resource Investigations for Twin Buttes Service Area Rural Water Distribution System Contract 7-7A of the Bowman-Scranton Project Area, W. O. 3033.872, in Bowman & Slope Co., ND	8021
2002	Bluemle, W.		Molitor Property Survey: A Class III Cultural Resource Inventory, Adams Co., ND	8140
2002	Morrison, J.		Living Snow Fence Survey of 28 Sites in Adams, Barnes, Bowman, Emmons, Golden Valley, Hettinger, Kidder, McIntosh, Mountrail, Oliver & Walsh Co., ND: A Class III Cultural Resource Inventory	8187
2002	Morrison, J.		South Hettinger Exchange: A Class III Cultural Resource Inventory in Adams Co., ND & Perkins Co., SD	8222
2003	Bluemle, W.		Amidon to Bowman Exchange: A Class III Cultural Resource Inventory Project in Bowman & Slope Counties, ND	8591
2003	Salisbury, E.	E. Stine	2003 Living Snow Fence Survey (B) of 22 Tree Sites in Adams, Grant, Hettinger, Kidder, McIntosh, Oliver, & Stutsman Counties, ND: A Class III Cultural Resource Inventory	8724
2003	Stine, E.		Hettinger to Mott Fiber Optics Line: An Intensive Inventory in Adams and Hettinger Counties, ND	8581
2003	Stine, E.		Highway 12: An Intensive Cultural Resource Inventory in Bowman Co., ND	8637
2003	Wermers, G.		Class III Inventories for Pipeline Additions and Reroutes in the Twin Buttes Service Area (Contract 7-7A) & the Twin Buttes Service Area/West Rainy Butte Booster Area (Contract 7-7B/7-3C)	8492
2004	Bluemle, W.		Highway 12: A Class III Cultural Resources Inventory Between Hettinger & the Bowman Co., Line in Adams Co., ND	8926
2004	Christensen, B.		STATEOP-0436: William Thompson Pit Class III Inventory Report Adams Co., ND	8942
2004	Wermers, G.		Road Improvement and Bridge Replacement Project (SC-0645[053]) in Bowman Co., ND and Harding Co., SD (UW#2457)	9055
2004	Wermers, G.		The Hansen Waterline and Stock Tanks in Sections 10 & 15, T130N, R98W, Adams Co., ND	8839
2005	Bleier, A.		2005 Living Snow Fence Transportation Enhancement Program Sites in Adams, Dickey, Emmons, Stark & Stutsman Counties, ND: A Class III Cultural Resource Inventory	9296
2005	Bluemle, W.		Two Schaaf Borrow Areas: A Cultural Resource Inventory in Bowman Co., ND	9335
2005	Kordecki, C.	D. Toom	Amendment to Road Improvement & Bridge Replacement Project SC0645[053] in Bowman Co., ND and Harding Co., SD	9290
2005	Salkin, P.		An Archaeological Survey of a Proposed Communications Tower Site in the Town of Hettinger, Adams Co., ND	9291
2005	Wermers, G.		ROW-117 Class III Inventory Report, Bowman Co., ND	9098
2005	Wermers, G.		ROW-118 Class III Inventory Report, Bowman Co., ND	9097
2006	Burns, C.		The Mellmer Pit: A Class III Cultural Resource Inventory, Adams Co., ND	9742
2006	Burns, W.	C. Burns	Bowman Airport Relocation/Expansion: A Class III Cultural Resource Inventory in Bowman Co., ND	9744
2006	Hiemstra, D.		ND04 Mirror Lake Alt 2: A Class III Cultural Resources Inventory for a Proposed Cell Phone Tower & Ancillary Facilities in Adams Co., ND	9985
2006	Stine, E.		Living Snow Fence Projects: A Class III Cultural Resource Inventory in Adams, Benson, Bottineau, Emmons, Griggs, McLean, Mountrail & Stutsman Counties, ND	9888

Year	First Author	Second Author	Title	Ms #
2006	Wermers, G.		ROW-159 Class III Inventory Report Bowman Co., ND	9584
2006	Wermers, G.		ROW-160 Class III Inventory Report Bowman Co., ND	9611
2006	Wermers, G.		ROW-161 Class III Inventory Report Bowman Co., ND	9609
2006	Wermers, G.		ROW-162 Class III Inventory Report Bowman Co., ND	9610
2007	Heiner, P.	J. Harty	Three Fiber Optic Cable Routes: Class II and Class III Cultural Resource Inventories, Bowman & Dunn Counties, ND	10040

Test Excavation Projects

There are few reports dealing with archeological test excavation in this Study Unit (Table 8.4), and one of them does not actually qualify in the sense that formal 1- x-1-m test units were not excavated. However, it should be considered here because it involves assessments of site significance based on something less than test excavation.

Table 8.4: Test Excavation Projects in the Grand River Study Unit, 5-Sept-2007.

Year	First Author	Second Author	Title	Ms #
1982	Loendorf, L.		Site Significance--Gascoyne Mine Expansion Survey, June 1982, & Historical Evaluation Report, Contribution No. 168, June 1982, Bowman Co., ND	2776
1982	Tibesar, W.		Results of Archeological Testing of Seven Sites Located Along Bowman-Haley Reservoir, Bowman Co, Southwestern ND	2758
1989	Borchert, J.	C. Wenker	Grand Electric Cooperative, Inc. & Koch Industries 69 kV Transmission Line Additional Cultural Resource Work Preliminary Report, Bowman Co., ND	4813
1993	Otto, R.		National Register Testing at 32BO35, A Cultural Material Scatter Located at Bowman-Haley Reservoir, Bowman Co., ND	6830
2005	Bleier, A.		US Highway 12: Evaluative Testing at 32BO106, 32BO109, 32BO174 & 32BO279 Bowman Co., ND	8822

In 1982, mapping and "testing" were conducted at seven prehistoric sites at Bowman-Haley Reservoir (Tibesar 1982). These properties were identified as cultural material scatters and a stone circle site. Late Plains Archaic and generically identified late prehistoric remains were encountered. The project was conducted for the US Army Corps of Engineers for the purpose of determining if any of these previously recorded sites were in need of formal test excavations to determine National Register of Historic Places (NRHP) eligibility. This work constituted a form of site evaluation which ranks midway between assessments made during site survey and those made by formal testing. The Corps called it "low-impact testing" (ibid.:5). Based on results of digging 119 shovel probes at the seven sites, with analysis of recovered artifacts conducted in the field, six of the sites were evaluated as ineligible for listing in the NRHP (32BO27, 32BO28, 32BO29, 32BO32, 32BO40, and 32BO41), and the seventh (32BO37) was appraised as needing further testing to adequately assess NRHP eligibility (ibid.).

In order to evaluate shovel probing as an appropriate technique for assessing the likelihood for sites to contain potentially significant artifact deposits, Tibesar reviewed results of projects in Wyoming and North Dakota where shovel-probed and auger-probed sites were subsequently test excavated.

He found that if probing indicates a low-density artifact deposit, then low density is usually confirmed by testing. Similarly, indications of high-density deposits by probing are usually confirmed (Tibesar 1982:33-34). It should be kept in mind that buried deposits cannot be assessed by probing if the probes do not reach deep enough to penetrate the deposits. Buried archeological deposits are typically revealed in cutbanks or on the surface in places where materials are brought up by plowing or animal borrowing. But this does not mean that the buried zone of archeological deposits runs at a uniform depth parallel to the modern surface. While a buried deposit may be near the surface in the area where it is detected, it may dip downward and be more deeply buried in other areas. Site assessment through probing should account for the possibility of deep burial.

In spring 2004, four sites were tested along Hwy 22 (Bleier 2005). All have been categorized as lithic reduction sites located on uplands overlooking drainages of Buffalo Creek. Disturbances to the sites include road, railroad, fence, and pipeline construction, fiber optic cable and utility pole installation, agriculture, and erosion/deflation and re-deposition. Generally, the artifact assemblages consisted of debitage, chipped stone tool fragments, cores, and tested raw material, comprising petrified wood, chert, and chalcedony. The author noted that some of the debitage may be the result of freeze/thaw action (ibid.).

The four tested sites include 32BO106, 32BO109, 32BO174, and 32BO279. Holocene deposits at 32BO106 were 5-10 cm thick with blended cultural deposits due to past deflation episodes (ibid.). At 32BO109, debitage was heavily patinated suggesting the site may date to the Plains Archaic (ibid.). The thickness of Holocene deposits was not determined. There was scant evidence of Holocene deposits at 32BO174, as the higher area(s) of the site previously had been used for borrow. Testing yielded a biface fragment, a core fragment, and a retouched flake in addition to debitage. Site 32BO279 differed somewhat from the others in the diversity of the artifact assemblage and raw material types. Recovered chipped stone tools include a fine-grained TRSS Paleo-Indian (possibly Eden) projectile point and a possible Besant point fragment (ibid.). However, the points were collected from stratigraphically unstable locations so even relative dating is suspect (ibid.:42). One obsidian flake was recovered from gravels in a deflated portion of the site. Though intact Holocene deposits were virtually nonexistent, a poorly defined paleosol was present approximately 85-95 cm below surface (ibid.:41). A sample of the paleosol was dated to 7180±80 BP or 6220-5890 BC (ibid.:41). An organic sediment sample at the base of a sterile level (50-60 cm below surface) dated to 410±60 BP or AD 1420-1640 (ibid.:41). Unfortunately, these dates may not be accurate due to the disturbed context of the site.

The management summary of the testing project indicates that the sites can not be dated to specific temporal periods due to the lack of integrity caused by natural and man-made processes. Testing of intact deposits is needed in the Grand River Study Unit.

NRHP and NDSHSR

There are no sites in the Grand River Study Unit that have been listed or been determined eligible for listing in either the NRHP or the North Dakota State Historic Sites Register (NDSHSR).

The current list of archeological sites in North Dakota listed on the NRHP is available on the National Park Service website. The following internet links are useful (NPS 2008a, b):

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

Major Excavation Projects

The work carried out at the Fisher (32BO207) and Red Fox (32BO213) sites is the only major excavation reported for this Study Unit. Leigh Syms' Master's thesis (1969) provides the most comprehensive treatment of the results of that 1965 work. While the excavations in the Bowman-Haley Reservoir locality were conducted by Mallory on behalf of the SIRBS, neither Mallory nor the SIRBS ever reported the results in any detail.

Quoting from Tibesar (1982:31):

> A month was devoted to the excavation of the Fisher site (32BO207), a small station on the right bank of the North Fork of the Grand River at the western terminus of the reservoir. The work produced evidence of five cultural components, although definitive materials were recovered from only the two stratigraphically oldest units. These were in a dark clay soil between 5.0 and 7.5 feet below the surface. Both contained rock-lined fire pits and projectile points associated with the early McKean Complex.
>
> Another month of excavation was carried out at the Red Fox site (32BO213), a multi-component locus on Spring Creek. The uppermost occupation resembles late Coa-lescent [*sic*] Tradition sites like those found along the Missouri River. Interposed between this level and the lowest zone were two intermediate components not as yet identified culturally. Excavation in the fourth and lowest component revealed numerous stone tools, rock-filled fire pits, and a portion of a pit about 15 feet in diameter which may have been part of a dwelling structure. The findings in this bottom level component associate it with the McKean Complex.
>
> The evidence accumulated from excavation, materials gathered from the surface, and private collections lead to the conclusion that the region was occupied by a succession of groups, probably

intermittently, from McKean times to the ethnographic present (Smithsonian Institution 1966:8).

Table 8.5 lists reports of excavation work at archeological sites in the Grand River Study Unit.

Table 8.5: Major Excavation Projects in the Grand River Study Unit, 5-Sept-2007.

Year	Author	Title	MS #
1965	Smithsonian Institution	SIRBS Progress Report 10 for the 1965 Field Season	--
1967	Mallory, O.	Bowman-Haley Excavations	--
1969	Syms, E.	McKean as a Horizon Marker in Manitoba & on the Northern Great Plains	--

Other Work

Syms' 1969 Master's thesis involved data from Bowman-Haley Reservoir Duncan components in a comprehensive review of the McKean complex throughout the Northern Plains. He concluded that the oldest McKean components of ca. 3000 BC lie in the mountains around the Big Horn Basin (1969:163).

Keyser (1982) presented another treatment of the Red Fox site data. In comparing remains from Red Fox with those from test excavations at the Lightning Spring site 30 km to the south in the upper Grand River drainage of South Dakota, he concluded that lithic reduction strategies and Duncan point styles between the two sites are identical and indicate the very same local group may have deposited the material remains sampled at each site (ibid.:31).

Table 8.6: Other Work in the Grand River Study Unit, 5-Sept-2007.

Year	First Author	Second Author	Title	Ms #
n.d.	Rose, J..	M. Kay et al.	Analysis of Human Osteological Remains Multi-County Areas, Emmons, Sioux, Bowman & Mercer Counties, ND	2755
1969	Syms, L.		The McKean Complex as Horizon Marker in Manitoba & on the Northern Great Plains	--
1982	Keyser, J.		A Comparative Analysis of Two McKean Phase Occupations in the Grand River Drainage	
1991	Karsmizki, K.		U308 Uranium Industry Context Statement. Adams, Slope, Golden Valley, Billings, Bowman, Dunn, & Stark Counties, ND	5477
2005	Emporia State University		Heritage of the Great Plains	9556
2005	Hufstetler, M.	J. Goff	Historic Bridges in North Dakota 2004 Revision	10128
2006	Hafermehl, L.		North Dakota Highway Bridge Number 12-046.415 Photographic Documentation of the Structure and a History of the Structure in the Context of Depression-era Grade Separation Construction in Bowman Co., ND	9690

Cultural/Temporal Affiliation

Table 8.7 shows the recorded cultural/temporal affiliation of archeological resources as recorded in the site files (13 September 2007).

Table 8.7: Cultural/Temporal Affiliation of Archeological Resources in the Grand River Study Unit, 13-Sept-2007.

Paleo-Indian	
Folsom	1
Plano	2
Total	**3**
Archaic	
Unspecified	2
McKean/Duncan/Hanna	7
Pelican Lake	1
Total	**10**
Woodland	
Unspecified	2
Besant/Sonota	1
Late Woodland	1
Avonlea	1
Total	**5**
Plains Village	
Total	**1**
Historic	
Euro-American	1
Total	**1**
Unknown	**208**

Paleo-Indian Period

Prospects should be good for the discovery of Paleo-Indian sites in this unglaciated country. A possible late Paleo-Indian site (39PE11) is recorded in the South Dakota portion of the Grand River basin (Winham and Hannus 1989:93). There should be others in the North Dakota portion. The late Paleo date from a buried soil plus the find of a probable Eden point fragment reported by Bleier (2005) are additional hints of Paleo-Indian presence in this drainage.

Paleo-Environmental Modeling

What were the local environmental conditions during Clovis, Goshen, and Folsom times? Were there lush grasslands and playa lakes to attract big game animals and the people who hunted them in the early Holocene? Understanding the nature of subsequent vegetational shifts would illuminate the search for intact paleolandscapes where early sites are likely to be found.

Some environmental conditions can be reconstructed from studying dated soils. A dark clayey zone of sediments with well-developed blocky structure was identified by bucket augering in proximity to a Scottsbluff point find at 32AD10 (Artz et al. 1987:6.36). If this stratum is the 7,000-9,000 year-old Leonard paleosol of the Aggie Brown member of the Oahe Formation (cf. Clayton et al. 1976), then it would be evidence that mesic conditions prevailed in this southwestern corner of the state as they did elsewhere during Paleo-Indian times. What are the environmental indicators from buried Holocene topsoils in the Grand River Study Unit? Are there any remnants of pre-Holocene-age paleosols in this Study Unit?

Cultural Chronology

Because the landscape of this area has not been altered by glaciation at any time since people arrived in the Americas, sites of all Paleo-Indian complexes are to be expected here, beginning with Clovis. Goshen sites should also be anticipated in the western portions of this unit because of proximity to the Mill Iron site (24CT30) in Montana, about 50 km to the west (Frison 1985, 1986, 1987, 1988b). Across the state line, 39PE11 recorded by Wheeler (1949a:3) produced a “ribbon flaked, flat-based, projectile point” of “high antiquity” (Beckes and Keyser 1983:154). This indicates a representation of the Parallel-Oblique Flaked complex. A possible Eden point was recovered at 32BO279 overlooking Buffalo Creek (Bleier 2005:42). However, the point was from a stratigraphically unstable context. What is the range of Paleo-Indian complexes represented in privately held surface collections of artifacts from sites in the Study Unit?

Settlement Behavior

Playa lakes may have attracted settlement, and sites should be anticipated along former shorelines. Hunting overlook locations ought to be represented on ridges and hills. Intact deposits may be anticipated on lee slopes and immediately behind windward edges of ridges where aeolian sediments have built up over the millennia. What is the range of functional variability that should be expected for Paleo-Indian hunter-gatherer settlements in this Study Unit?

Native Subsistence Practices

Subsistence practices of Paleo-Indian peoples are completely unknown from this Study Unit. Immediately to the west at the Mill Iron site, groups using Goshen-style spear or dart points killed and butchered bison nearly 11,000 years ago. The nature of the big game resource base was changing rapidly at that time. A few hundred years earlier, people were hunting mammoths, camels, and llamas. By Goshen times, those fauna were in the process of extirpation at this latitude in the Northern Plains. Knowledge of the floral and faunal resource bases can be gained without archeological excavations. When early Holocene soil exposures are identified, they can be analyzed for pollen and phytolyths to provide an indication of local flora. Any early Holocene paleontological discoveries should be professionally excavated and radiocarbon dated in order to gain some understanding of the animal species present at different points in time through the Paleo-Indian period.

Technologies

Paleo-Indian flintknapping typically involved the production of large biface preforms which were reduced to make the various styles of projectile points. Large blocks of smooth TRSS available in this Study Unit would seem to have been suitable for such a purpose. Were other materials available here such as pebbles of KRF and agatized wood, of the high quality desired by Paleo knappers, too small to have attracted procurement and workshop parties use of sufficient intensity to have produced detectable archaeological sites? Workshop sites could be approached from a technological perspective in attempts to identify Paleo-Indian components.

Artifact Styles

A Scottsbluff point was collected from the surface of 32AD10 near Hidden Wood Creek (Flat Creek) a few miles southwest of Rocky Ridge (Artz et al. 1987:Figure 6.21). The point has a very distinct haft element, but the shoulders at the base of the blade are not prominent. Indistinct shoulders are more typical of southern and western Scottsbluff point forms than eastern ones. Eastern styles tend to have more pronounced shoulders. Even the Scottsbluff points recovered by Ralph Thompson from the Southern Missouri River Study Unit have distinct

shoulders. Do these differences in Scottsbluff point styles represent temporal differences, or do they represent geographic differences? Do differences in point styles between eastern and western North Dakota indicate cultural distinctions between various groups of late Paleo-Indian hunting and gathering peoples?

Regional Interaction

In this and other study units in the southwestern part of the state, there are great varieties of good quality lithic materials available for flintknapping. In order to be able to address questions of Paleo-Indian exchange of lithic materials, it will be necessary to identify the range of materials available in this unit. Aside from the fact that quartzites, TRSS, agatized woods, silcrete, chalcedony, and KRF occur here, little is known of the actual ranges of variation in material characteristics. It would be helpful for archeologists working in the state to apply uniform criteria for identifying these and other lithic raw materials.

Historic Preservation Goals, Priorities, and Strategies

An effort should be made to identify landforms where surfaces of Paleo-Indian age can be surveyed for sites. One approach to this problem is through collector-informant interviews. When informants can identify places where they found Paleo points, those places can be checked for possible remnants of early Holocene surfaces.

Plains Archaic Period

Sites of the Middle Plains Archaic Duncan complex appear to be well-represented in the upper Grand River basin. The Duncan and McKean Lanceolate components at the Red Fox and Fisher sites are among the most prominent components of those complexes investigated in North Dakota (cf. Syms 1969; Tibesar 1982).

Paleo-Environmental Modeling

Eras of cultural fluorescence and population expansion during the Plains Archaic periods were likely times with rainfall sufficient to support lush grasslands and overall abundant biotic resources. Site 32B0111 is situated adjacent to a playa lake which now holds water seasonally. A Middle Plains Archaic Duncan point was found at this site (Artz et al. 1987:Figure 6.2c). Holocene climatic reconstruction is presently inadequate to determine if the playa was a body of permanent water during the era of the Duncan complex. Were the heydays of the Duncan, Oxbow, McKean Lanceolate, Hanna, and Pelican Lake complexes generally more mesic than the present?

The numerous distinct levels in the Fisher, Red Fox, and Lightning Spring Middle Plains Archaic deposits indicate pronounced fluctuations in periods of adequate rainfall alternating with periods of drought. These physical remains of

cycles of sediment deposition and then stabilization, soil development, and human occupation offer rare opportunities to conduct detailed studies of the climatic conditions of the Middle Plains Archaic period.

Cultural Chronology

Sites of the Early Plains Archaic period (with diagnostic Hawken or Simonsen points) have not yet been identified here. The Reva site along the Little Missouri River in nearby northwestern South Dakota reported by Gant in 1961 may be Early Archaic (Metcalf et al. 1988:23). The Grand River Study Unit lacks Early Plains Archaic radiocarbon dates, but there are Middle Plains Archaic dates from the Bowman-Haley Reservoir sites, and there are Middle and Late Plains Archaic dates from the nearby Lightning Spring site in the upper Grand River basin just over the state line in South Dakota. At the Red Fox site, occupation zone 4, about 100 cm below surface, yielded 6 complete points and 10 fragments, all but one of which were identified as Duncan (Syms 1969:134). A radiocarbon date on charcoal from the zone was 3770±90 BP (ibid.)

Radiocarbon dates for the Duncan levels at the Lightning Spring site range from 3430±270 BP to 4190±110 BP (Beckes and Keyser 1983:101).

McKean Lanceolate components are very uncommon in comparison with Duncan components at the excavated sites. McKean Lanceolate has been positively identified only from zone 4 at the Fisher site (Syms 1969:136). Large samples of artifacts recovered by excavation from the distinct levels of several of these sites should yield samples which would provide a good test of the proposition that McKean Lanceolate, Duncan, and Hanna are distinct styles representative of different cultural complexes.

One of two Pelican Lake components at Lightning Spring is dated AD 30±120 (Beckes and Keyser 1983:221; Keyser and Davis 1984), contemporary with Plains Woodland Besant/Sonota components. This lends further support to B.O.K. Reeves' proposition regarding the contemporaneity of the Napikwan and Tunaxa "traditions."

Settlement Behavior

During the era of the Duncan complex, some sites appear to have been situated near ponds. Examples include 32BO111 adjacent to the Bowman Playa and perhaps the Red Fox site at Bowman-Haley Reservoir which may have been the site of a permanent lake during mesic times. It has been suggested that there was a local group with Duncan material culture which may have regularly spent all or most of the year in the upper Grand River drainage. This suggestion is based on inferred contemporaneity between two sites 30 km separate (cf. Artz et al. 1987:6.25; Keyser 1982, 1985; Keyser and Davis 1984; Syms 1969).

Are Duncan sites more common here than sites of any other Plains Archaic complex? Do sites of the Duncan complex represent a broader-based adaptation to the resources of the upper Grand River basin than sites of other Plains Archaic complexes? Syms(1969:169) suggested that people who made McKean Lanceolate, Duncan, and Hanna points were similar to historically recorded hunter-gatherers such as the Cheyenne in that they lived much of the year in small groups and combined into large aggregates during the summer (or whenever feasible) for communal buffalo hunts.

Native Subsistence Practices

Food remains from "McKean" components throughout the Northern Plains range from predominantly bison, indicative of a heavy meat diet, to predominantly small game, wild plants, and insects signifying a diet somewhat comparable to that of the Desert Archaic (Syms 1969:167). This suggests considerable variation in McKean subsistence practices. Does this reflect seasonality, regional variation, cultural preferences, archeological sampling error, or something else?

For the Duncan complex, Lightning Spring provides evidence for a wide range of wild plant and animal food procurement and processing at a site which is thought to have witnessed repeated short-term occupation. There are antelope and bison bones, with antelope predominating in samples from test excavation (Keyser and Davis 1984). The occurrence of slab milling stones and manos indicate plant grinding was a common activity.

Duncan components in this Study Unit appear to present unusual potential for yielding subsistence-related data from relatively dense archeological deposits. Was there a richer subsistence resource base available to Duncan hunter-gatherers than to other Plains Archaic people who used the upper Grand River basin?

Technologies

Jim Keyser (1985) conducted a technological analysis of projectile points and scrapers, including the production sequences represented, from the Red Fox and Lightning Spring sites. Seven stages were identified in the point-making process (Keyser 1982:37-39). Production sequence studies are lacking for other Plains Archaic artifact types. To what extent are production sequence similarities attributable to cultural behavior versus limitations imposed by raw material characteristics?

Artifact Styles

The Middle Plains Archaic levels at the Fisher, Red Fox, and Lightning Spring sites offer unusual opportunities to document stylistic variation and

conformity in large samples of points from tightly controlled stratigraphic and temporal contexts. Type styles are well known, but stylistic variation is poorly understood. Is there evidence from any of these discrete components that McKean Lanceolate, Duncan, and Hanna were contemporary?

Regional Interaction

The Middle Plains Archaic components (or cultural zones) at the Red Fox, Fisher, and Lightning Spring sites offer exceptional potential to investigate variations in regional interaction as well as other aspects of culture change through time. This is due to the stratification of the deposits. Such stratification is very uncommon in North Dakota archeology. Excavations at the Red Fox site revealed five "stratigraphically distinct occupation zones" (Syms 1969:132). Within the McKean Lanceolate zone at the Fisher site, there were "nine closely-spaced occupation levels" (ibid.:136). At Lightning Spring (39HN204), there are four Duncan levels plus seven later and other earlier levels (Beckes and Keyser 1983:221-222). With the sorts of stratigraphic separation presented by these sites, studies of nonlocal and exotic lithic raw materials would be likely to yield exceptional information regarding characteristics of regional interaction through time. It might even be possible to detect hints of seasonal differences in regional interaction if particular cultural zones could be attributed to specific seasons.

Historic Preservation Goals, Priorities, and Strategies

As with all other Study Units, components of the Early Plains Archaic period are underrepresented in comparison with those of the Middle and Late Plains Archaic periods. The paucity of Early Plains Archaic sites may be attributable to Mid-Holocene drought, but evidence for Atlantic climatic episode xeric conditions has not been compiled. Sedimentological and geomorphological studies of stratified columns in the lowest levels of Middle Plains Archaic sites could yield such information.

The Fisher site is situated above the pool level of Bowman-Haley Reservoir, and the Red Fox site is periodically accessible at times of low water (Robson 1981; Tibesar 1982:36). National Register of Historic Places nominations and salvage excavations have been called for at both of these sites by both Robson (ibid.) and Tibesar (ibid.). Not only do they hold important information, they have been damaged by reservoir shoreline erosion. The Omaha District of the US Army Corps of Engineers should be asked to place these two significant properties on their list of sites in need of NRHP nomination and focused stewardship.

Plains Woodland Period

Early Woodland sites containing pottery should probably not be expected this far out into the Northwestern Plains subarea. However, contemporary cultural complexes should be anticipated, and they would be classifiable as

Pelican Lake or some other complex representing a Plains Archaic adaptation. Components attributable to the Besant/Sonota continuum should be present, but again, the lifeways represented ought to be reflective principally of Plains Archaic rather than Plains Woodland adaptations. The same should be true for Late Plains Woodland, although it is difficult to even guess what archeological complexes beyond Avonlea might be represented.

Paleo-Environmental Modeling

It has been posited by Gregg that the Besant/Sonota cultural fluorescence was made possible by a protracted period of time within the Sub-Atlantic climatic episode during which mesic conditions persisted throughout the Northern Plains, and overall biotic resource potential was high. This period of time is marked by a thick, well-developed paleosol in floodplain stratigraphic sequences in the James River valley of eastern North Dakota (Gregg and Swenson 1987:68). If the proposition is correct, this soil should have developed in places in the Grand River Study Unit, and it ought to be preserved in some places as a paleosol. If this paleosol is identified in the course of inventory projects, it should be examined closely for artifacts.

Cultural Chronology

Late Plains Archaic components contemporary with the Early Plains Woodland period may be expected to contain small corner-notched dart points classifiable as Pelican Lake. Metcalf and Black (1985:132) reported finds of such diminutive corner-notched points from 39HN152 and 39HN163 in the North Cave Hills of nearby northwestern South Dakota. At 39HN163, one was found in a zone between strata dated 3000 and 2500 BP.

A Middle Plains Woodland component is reported from 32BO32 at Bowman-Haley Reservoir where a Besant Side-Notched point was found (Tibesar 1982:19). The point was made from a brown colored Morrison silicified sediment or Morrison quartzite (other terms for TRSS) (ibid.:7). A possible Besant point fragment was recovered at 32BO279 overlooking Buffalo Creek (Bleier 2005:42). However, the point came from a stratigraphically unstable context.

What artifacts are diagnostic of Plains Woodland components in the upper Grand River basin? Will Late Plains Woodland components here resemble those in the Southern Missouri River Study Unit or possibly Avonlea components to the northwest and south? The archeological cultures evincing Plains Woodland adaptations along the Missouri River should have been distributed westward to the headwaters of the major drainages feeding the Missouri River.

Settlement Behavior

For a full range of Besant/Sonota settlement types to be represented in the upper Grand River basin, some local group would have had to establish a core

area here with a residential base settlement. There would be semipermanent lodge features, midden areas, and mortuary sites. The fact that no such sites and features have yet been identified in the Study Unit may be an indication that the area was not settled as a core area by Plains Woodland peoples. Plains Woodland sites need to be inventoried and settlement types appraised, even if appraisals are based on surface artifacts and features. Occurrence of earthen mounds would point to possible use of this region as a core area by some Woodland group.

Native Subsistence Practices

Plains Woodland lifeways were based primarily on hunting and gathering and sometimes involved gardening. The more sedentary the lifeway seemingly, the more important was gardening. But semi-permanent residential settlements were not necessary. Historically, "older Cheyenne, even after becoming nomadic, retained some horticultural practices" (Wood 1971:68). The parameters of hunting and gathering practices would have been established by resource availability which can be estimated as part of paleo-environmental modeling. What was the flora and fauna resource potential of the upper Grand River basin during Early, Middle, and Late Plains Woodland times?

Technologies

The era of the Besant/Sonota complex (ca. 100 BC-AD 600) spans the period when the bow and arrow supplanted the atlatl and dart as preferred weaponry. This was a technological shift with archeological implications. First, dart points are generally distinguishable from arrow points based on size with arrow points typically weighing about 1 g and dart points 2 g and more. Secondly, the flintknapping reduction processes employed to make large patterned bifaces involved more use of percussion flaking, while arrowpoints were produced primarily by pressure flaking. Further, arrowpoint production did not require the large spall blanks and biface preforms necessary for making large dart points. Production of flake blanks by bipolar percussion increased in prevalence (cf. Ahler and VanNest 1985) and enabled the exploitation of pebble-sized pieces of stone. Procurement-workshop sites in areas where only pebble-sized materials are available are more likely to be Late Plains Woodland, Plains Village, or generically late prehistoric than procurement-workshop sites where large-sized materials are available. Also, spent bipolar cores and bipolar flaking debris are often indicators of late prehistoric artifact deposits.

Artifact Styles

Besant/Sonota ceramics can be identified by their decorations in combination with considerations of sherd thickness, rim profiles, exterior surface treatment, and interior surface treatment. The most common decoration involves a row of punctates on the exterior rim, usually creating slight nodes on the interior (Neuman 1975). Sometimes a band of dentate stamps or other impressions occurs along with the punctates on the exterior rim. Other decorative

modes include cord impressions on the lip (Neuman 1975), cord-wrapped object impressions on the lip (Johnson 1977a), and transverse or oblique tool impressions on the lip (Wood and Johnson 1973:43). At the Porcupine component along the Missouri River in Sioux County, North Dakota, some vessels have interior bosses without exterior punctates, and some lips are incised (Wood 1967:118). Besant/Sonota body sherd thicknesses range from 4-15 mm (cf. Neuman 1975; Wood and Johnson 1973:43), overlapping considerably with the range of thicknesses for Late Plains Woodland and Plains Village sherds. Therefore, sherd thickness alone cannot be viewed as temporally diagnostic. Do Besant/Sonota vessels from sites in the interiors of the major Missouri River tributary basins differ in form from those from residential base sites along the Missouri River, as do Plains Village vessels?

Regional Interaction

When Plains Woodland sites are identified, regional contacts will be evidenced by projectile point styles (e.g., Besant Side-Notched) and ceramic vessel decorative treatments which link the study area with the overall geographic extents of those traits. Obsidian of Rocky Mountain origin should be anticipated. It has been posited that Besant/Sonota exchange systems articulated with the interregional Hopewell Interaction Sphere (HIS) (cf. Caldwell 1964; Struever and Houart 1972). People with Besant/Sonota material culture were participants in this intersocietal network of exchange (Gregg and Picha 1989b:45). Obsidian and KRF were moved eastward across the Northwestern Plains, Middle Missouri, and Northeastern Plains subareas into the HIS. Was South Dakota obsidian or nonvolcanic natural glass of lignite-burn origin (cf. Frison 1974a) utilized by Middle Plains Woodland people to the extent that Rocky Mountain obsidian material will be obscured in local archeological deposits?

Historic Preservation Goals, Priorities, and Strategies

There are major data gaps concerning Early, Middle, and Late Plains Woodland archeological components in this Study Unit. A top priority is to determine if components of all three periods are indeed present. Plains Woodland sites likely will be identified based on the occurrence of ceramic remains. However, the problem of differentiating Early, Middle, and Late Plains Woodland and Plains Village sherds may be more difficult here than in eastern riverine core areas, where large samples of sherds can be collected from residential base settlements. If the upper Grand River drainage was used by Plains Woodland groups predominantly as a secondary area, other influences such as concern for vessel portability could have had obscuring effects on ceramic technological and stylistic attributes. More Woodland sites need to be identified and sherd samples collected to determine ranges of technological and stylistic variation.

Plains Village Period

A Plains Village occupation is indicated at 32BO32 in the Bowman-Haley Reservoir locality (Tibesar 1982:15-19). The resources of the upper reaches of the Grand River basin should have been exploited at least annually by Villagers ranging out of their earthlodge village residential bases along the Missouri River.

Paleo-Environmental Modeling

A period or periods of drought seem to have occurred during the Pacific climatic episode of ca. AD 1250-1500. The drought(s) came after Plains Village cultures had adapted to many places throughout the Northern Plains where local climatic conditions allowed for gardening. The adverse environmental conditions caused by drought and cultural adaptations to those conditions are thought to have led to conflicts between groups (Lehmer 1971:105; Zimmerman and Bradley 1982). Depositional contexts of Plains Village components in the upper Grand River drainage could yield important information regarding climatic conditions to the west of the Middle Missouri subarea. Early Plains Village (Initial and Extended Middle Missouri variant) site deposits situated in aeolian or alluvial depositional contexts may be capped with sediments which separate them from late Plains Village Coalescent variant deposits.

Cultural Chronology

The occupation of 32BO32 along the North Fork of the Grand River in the Bowman-Haley Reservoir locality is estimated to date between AD 1450 and 1850 based on typological similarities to points from the tightly dated stratigraphic sequence at the Vore site (48CK302) (Tibesar 1982:19). During that period of time, most earthlodge villages in the Grand-Moreau region of the Middle Missouri subarea are classified as Extended Coalescent and Post-Contact Coalescent. If drainage basins were controlled by the Villagers as secondary use areas (cf. Syms 1977), are components such as the one at 32BO32 likely to be Coalescent? There is a lack of information concerning chronological placement of Plains Village components in this Study Unit.

Settlement Behavior

The Villagers' use of the plains west of the Missouri valley was typically seasonal and temporary in historic times. But villagers probably relied on the bison grazing lands of the drainage basin interiors for hunting territories throughout the year. Prehistorically as historically, hunting groups would have hunted and butchered and established field camps throughout the Grand River basin. Plains Village sites need to be identified and functional site types determined.

Native Subsistence Practices

In the field camps of Villagers, some faunal remains resulted from provisioning efforts while others relate to direct consumption. Variations in the ways animals were processed may also be attributable to weather conditions, conflicts with other groups using the territory, and the ability of hunting parties to process all the game they killed. Foods that were common in the villages may have been used infrequently in the field camps. Dogs, for example, were eaten at residential sites, sometimes in conjunction with ceremonies or when food stores were low (cf. Snyder 1988), but dogs may seldom have been eaten at field camps. Samples of faunal and floral remains from Plains Villages sites in the upper Grand River basin of North Dakota are inadequate for any considerations of subsistence practices.

Technologies

Plains Village potsherd collections have not yet been reported from sites in the Study Unit, but there is Village pottery from two cultural zones at Ludlow Cave near the drainage divide between the Grand River and Little Missouri River drainages in South Dakota not far to the southwest of the Study Unit. Ceramic vessel exterior surface treatments on those sherds are smoothed (or plain), smoothed-over cordmarked, and smoothed-over simple stamped (Alex 1979). Some sherds were smoothed to the extent that they are polished. Some pastes are tempered with sand and others with crushed granite. Estimates of interior neck diameters range from 10-20 cm. These are fairly small pots of the size that would be expected of people on the move (cf. C. Johnson 1983:9.60). Is there any reason to expect to find remnants of large prehistoric ceramic vessels in this Study Unit? Are there any exceptionally good clay sources here that would have been exploited by the Villagers to actually fabricate pots while residing at temporary campsites in the area? Are the small Ludlow Cave sherd samples indicative of early (pre-drought) Initial or Extended Middle Missouri occupation rather than later Coalescent occupation?

Artifact Styles

The Plains Village vessels from the lower two cultural zones at Ludlow Cave are globular jars with constructed necks and straight to outcurved rims (Alex 1979). Lip forms are variable, and decorations were executed by cord impressing and fine incising. Fine incising appears to be a very late prehistoric to protohistoric trait in southeastern North Dakota (Gregg et al. 1987:495-496) and may well have been of similar antiquity in the southwestern part of the state. Do Plains Village ceramics from the Grand River Study Unit show greater affinities to Coalescent ceramics from the Grand-Moreau region of the Middle Missouri subarea than Extended and Terminal Middle Missouri ceramics of the adjacent Cannonball River Study Unit?

Regional Interaction

The "uppermost occupation" at the Red Fox site was described in the 1966 SIRBS field report as "resembling late Coalescent sites" such as those found along the Missouri River (Tibesar 1982:31), although it was not stated what those resemblances were (e.g., pottery styles). If the Plains Village sites in the upper Grand drainage are more typically Coalescent than Middle Missouri, then material remains evincing regional interaction should reflect those of Coalescent cultures. At 32BO32, a Plains Side-notched arrowpoint made from purple Spanish Diggings quartzite and a plate chalcedony bifacially prepared knife fragment were found during the surface collection (Tibesar 1982:15). Both of these are Coalescent indicators: "Coalescent villagers in the Grand-Moreau region used more solid quartzite, jasper/cherts, and flattop and plate chalcedonies than their Extended Middle Missouri neighbors" (C. Johnson 1984:300). What other sorts of artifacts having information potential regarding the topic of regional interaction can be expected in Plains Village sites in the upper Grand River basin?

Plains Village ceramic traits alone may be insufficient to positively identify ceramic components as Plains Village. Not far to the west in southeastern Montana, a "Powder River ceramic tradition" has been defined which is posited to have been developed by a regional population which picked up ceramic traits from Extended Middle Missouri people living in the distant Missouri River Trench with whom they interacted seasonally (Keyser and Davis 1982:300-301).

Historic Preservation Goals, Priorities, and Strategies

Village pottery at sites in the interior Grand River basin is not necessarily an indication of an occupation by Villagers in a hunting and gathering mode. The nomadic Crows, who began fissioning from the Hidatsas in the 1500s (Bowers 1948; Medicine Crow 1979; Wood and Downer 1977), also made pottery which is sometimes indistinguishable from Village pottery (Frison 1976a; Mulloy 1942:99-102). What range of Plains Village ceramic technological and stylistic attributes should we anticipate at sites in this Study Unit? Definitions could be based on general attributes of Coalescent pottery tempered with considerations of the limitations on form imposed by settlement and travel far removed from core areas.

Equestrian/Fur Trade Period

Sites of equestrian nomads as well as groups of horse-mounted Villagers are expected here. But it may prove to be more difficult to identify these sites than to identify prehistoric sites because there are often fewer physical traces of the occupations. During equestrian times, there came to be greater reliance on metal tools and utensils, and chipped stone artifacts and potsherds were less frequently used, lost, discarded, cached, and abandoned. Stone circle sites lacking

visible chipped stone artifacts should be metal detected to check for historic period artifacts.

Paleo-Environmental Modeling

The cool and moist Little Ice Age conditions of the Neo-Boreal climatic episode enabled bison populations to expand between AD 1500 and 1800 (Reher and Frison 1980:50). The beginning of the Equestrian period overlaps with the later years of the Little Ice Age. The parameters of shortgrass plains adaptations were set by climatic conditions. The productivity of the shortgrass ecosystem is highly dependent on effective moisture, and the biomass can drop as much as 90% during a drought period (ibid.). Can historic climatic conditions recorded at settlements in the East such as St. Louis, perhaps in conjunction with data from the Southwest (e.g., Santa Fe), be used to refine paleo-environmental modeling for the Equestrian period in the Northwestern Plains (cf. Penman 1988)?

Cultural Chronology

When Equestrian period sites are identified, they are more likely to be attributable to Equestrian nomads than Villagers. After the smallpox epidemic of AD 1780-1782, Village populations were greatly diminished and their cultures disorganized (Lehmer 1971:32). Thereafter, aggressive horse nomads such as the Dakota Sioux began to assert themselves on the Northern Plains, and they had the effect of restricting the movements of the Villagers (cf. C. Johnson 1984:299). What material characteristics will enable differentiating sites of the Equestrian Nomadic tradition from Equestrian period sites of the Plains Village tradition?

Settlement Behavior

Equestrian groups occupied rockshelters in the Cave Hills portion of the Grand River drainage just over the state border in South Dakota. Excavation of the most recent cultural zone at Ludlow Cave in the Bull Creek drainage, a tributary of the South Fork of the Grand River, yielded feathered arrowshafts, glass or porcelain beads, brass finger rings, and metal arrowpoints which William H. Over attributed to historic Siouan occupation (Alex 1979:55). While there may be no rockshelters in the North Dakota portion of the Grand River drainage, it can be suggested based on South Dakota sites such as Ludlow Cave and protohistoric rock art sites in the Cave Hills (cf. Beckes and Keyser 1983:232-236) that temporary campsites can be expected throughout the upper Grand River basin.

Native Subsistence Practices

Ethnohistoric accounts confirm a subsistence focus on bison coupled with hunting for hides for the Euro-American trade in the 1800s. As during other times in prehistory, the fundamental need for stores of bison meat and other foods was to enable subsisting through the winter and early spring, “the major

limiting seasons in the shortgrass ecosystem" (Reher and Frison 1980:137). Considering the great numbers of bison and the intensity of hunting in the Northwestern Plains during this period as evidenced by the stratigraphic sequence at the Vore site (ibid.), bison kill and processing sites of this age should be expected in the Study Unit, but none have yet been recorded. Site leads could be gleaned from historic records such as diaries written by turn-of-the-century homesteaders who made notations concerning locations from which bison bones were collected for sale as part of the late 19th century bone commerce (Barnett 1972).

Technologies

The century of the Equestrian period in the Northern Plains was one which saw a steady influx of material items of European and Euro-American manufacture gradually replace those of native manufacture (cf. Goulding 1980; Toom 1979). Archeologically, the most prominent representations of this process are seen in metal tools replacing those of chipped stone and metal pots supplanting native-made ceramic vessels. Stone and native ceramic artifacts are well represented in sites dating to the late 1700s such as Midipadi Butte (32DU2) in the Garrison Study Unit (Kuehn et al. 1984). Such traditional native products are poorly represented at settlements occupied in the late 19th century such as Like-a-Fishhook Village (32ML2) in the Garrison Study Unit (Smith 1972). In fact, the proportions of native to European technologies represented in an archeological deposit can sometimes enable quite accurate typological dating. Technologies characteristic of various times throughout the Equestrian period should be represented at sites in this Study Unit, but information is sorely lacking on the topic. What criteria can be used to distinguish early historic Indian sites from non-Indian sites dating to the Equestrian period in the upper Grand River drainage?

Artifact Styles

Extensive movements of different ethnic groups during the Equestrian period resulted in more ethnic variation in the use of particular secondary areas, tertiary areas, and even specific communal kill sites than during earlier prehistoric times. This phenomenon is evidenced by greater arrowpoint stylistic variation in the upper protohistoric levels than in the lower late prehistoric levels at the Vore bison kill site lying 200 mi to the south of the Study Unit in the northern Black Hills (Reher and Frison 1980:142). Basally notched Plains Side-notched forms may be diagnostic of this period, although the style may have had its inception slightly prior to AD 1780 (cf. ibid.:25). Given the intensity of regional interactions, artifact styles diagnostic of this period throughout the Northern Plains may also be expected to occur in this Study Unit. What extents of regional interaction are indicated by artifact styles in Equestrian period components in the upper Grand River Study Unit?

Regional Interaction

Interactions between groups were certainly more intensive (or frequent) during this period than during most other eras of Native American culture history. With horses enhancing speed of travel and extending ranges, prospects were heightened for both friendly and hostile encounters. Rates of trade and other forms of exchange increased, and warfare also increased. Protohistoric rock art sites in the Cave Hills in the Grand River headwaters region of nearby South Dakota display biographic petroglyphs of people on horseback in combat scenes (Beckes and Keyser 1983:236). Warfare is also a dominant theme in the "ledger book art" of the late 1800s. What are other forms of archeological evidence of intensive social interactions between people who used the upper Grand River country during this period?

Historic Preservation Goals, Priorities, and Strategies

The primary data gap for these Equestrian period contexts in the upper Grand River Study Unit is simply the lack of identified sites. The top priority for developing these contexts is to build a sample of recorded sites through a specific inventory effort. One strategy for finding site locations of this period is to review early historic records of various sorts for notations concerning Indian camps, villages, trails, and other activity areas. The goals of ethnohistoric research and archeological investigations can be complementary. Were the Medicine Pole Hills and Tepee Buttes named for early historic Indian associations?